

CW-YECL-1

Reference: YECL Application, Schedule 9.2

Issue/sub-issue: Capital Expenditures

Preamble: In Schedule 9.2, YECL provides actual and forecast capital expenditures. CW notes that there is a pattern of over forecasting. For 2013, total capital expenditures were over forecast by \$3.9 million (20%). For 2014, capital expenditures were over forecast by \$2.9 million (14%) and for 2015 capital expenditures were over forecast by \$3.8 million (26%). This results in a total over forecast of \$10.5 million (20%) over the three year period. CW notes that the majority of the variances are in new extensions,

Request:

- (a) Please provide a detailed explanation of the reasons for over forecasting. In particular, please focus on the reasons why, not just which projects were the cause of the forecast error.

Response:

- (a) The main reason for lower capital expenditures as compared to approved is new extensions which account for \$9.3 million of the \$10.5 million referenced in the preamble above. The main reason for lower new extensions is slower economic growth than previously anticipated. New Extensions are a capital cost not at the control of AEY and are dependent on development within the communities in which the company operates.

AEY would also like to note that offsetting these lower capital expenditures is also \$8.2 million dollars in lower contributions received. Therefore, controllable capital was within 3.2% of that approved as part of YECL's 2013-2015 GRA.

	2013-2015		
	Actual	Approved	Var (%)
New Extensions	6,141	15,480	60.3%
Contributions	(4,866)	(13,039)	62.7%
Net New Extensions	1,275	2,441	47.7%
“Controllable” Capital	36,748	37,955	3.2%
Total Net Capital	38,023	40,396	5.9%

CW-YECL-2

Reference: YECL Application, Appendices 1-11

Issue/sub-issue: Capital Expenditures

Preamble: In Appendices 1-11 YECL provides business cases for a series of projects. CW requires information to understand the nature of the YECL internal capital approval processes.

Request:

- (a) For each of the listed business cases, please confirm that the internal documentation or business cases used for approval of capital expenditures is identical to the business cases provided in the referenced appendices. If not confirmed, please provide copies of the internal documents or business cases used by management to approve each project, including signatures and dates of signatures.
- (b) For each of the business cases listed, please confirm that YECL has received internal approval for the execution of the respective capital project. If not confirmed, please fully explain. In the response, please clearly identify which projects included in the GRA forecast have internal management and executive approval and which do not.
- (c) Please fully discuss the YECL internal planning process for capital projects. In the response, please fully explain if any projects are rejected internally, and how any capital rationing or constraints on the availability of capital is imposed on YECL.

Response:

- (a) AEY is of the view that the materials filed in support of the approvals requested in its Application fully support the prudence of the subject expenditures. AEY will rely on the full record of this proceeding as it develops (including the Application, IR responses, Rebuttal, hearing testimony if a hearing is required, Argument and Reply, etc.) to support the requested approvals.
- (b) Each business case included in the application has internal approval to proceed.
- (c) A process has been developed to ensure capital projects are completed in a safe, timely, and cost effective manner. The practice is applied to all capital

projects to ensure that the needs of the project are met and all costs are prudently incurred.

In undertaking any capital project, AEY uses a variety of means to ensure decisions made and costs incurred are reasonable at the time they are made, that projects are delivered prudently given the information available at the time, and that actions taken are in the best interests of both AEY and its customers. Generally, projects proceed through three phases; planning, project execution and close out.

Planning Phase

The planning phase establishes the total scope of the project, and develops a preliminary cost estimate, projected schedule, and obtains authorizations and permits to proceed.

For all projects, varying degrees of business cases are completed, depending on the complexity of the project, the magnitude of costs, the alternatives being considered, and overall impact to AEY and its customers. For example, line construction projects have varying degrees of business cases developed with full business cases completed for projects over \$500,000. A similar approach is utilized for all capital projects, but within each appropriation (generation, new extensions and customer driven, general plant and equipment) only actions that are required and are appropriate are completed.

Project Execution Phase

Project execution includes all work processes and tasks that are performed to complete the work. Tasks include performing the design, procurement, and construction activities of the project.

All projects are designed and constructed to engineered standards. The projects have the oversight of professional engineers who ensure the solution is technically sound, cost effective, and meets the needs of the system and the customer. They are designed to meet all pertinent regulations and standards.

AEY applies procurement policies that maximize competition and reduce overall costs for services and materials.

AEY uses a number of contracting strategies such as lump sum, hourly rates and unit rates depending on the requisites of the project. Successful bidders are then selected based on a number of factors including a weighting criteria considering: price, ability to meet required schedule, safety performance, resources and

experience to complete the scope of work, and previous workmanship. AEY utilizes contract resources for powerline construction, vegetation management services, and non-core skills such as building design, civil construction, and excavating services.

Close Out Phase

The close out phase consists of a review of the project package with the various forms from all departments and recorded costs in the financial system. The project file checklist is reviewed to ensure any permits are properly closed and recorded, easements are registered and construction as-builts are completed to the approved design. Typical close out for power system projects includes; acceptance testing, commissioning of protection settings and Operations acceptance for system integration.

CW-YECL-3

Reference: YECL Application Appendix 3, Watson Lake Bi-Fuel Project

Issue/sub-issue: Capital Expenditures

Preamble: In Board Order 2014-06, the YUB rejected a Watson Lake bi fuel project. CW requires information to assess the business case.

Request:

- (a) Please confirm that the requested Watson Lake project in Appendix 3 to this application is the same project that was requested in the proceeding leading to Board Order 2014-06. If not confirmed, please fully explain.
- (b) Please provide the business case from the proceeding leading to Board Order 2014-06 for the Watson Lake Bi-Fuel Project.
- (c) Please clearly identify all changes between the business case referred to in Board Order 2014-06 and the business case in Appendix 3 of this application.
- (d) Please fully explain how the new business case addresses each deficiency addressed in Board Order 2014-06.
- (e) On page 2 of the Business Case, YECL states "Following Board approval, the project will be separated into the following components and each component will be competitively tendered" Please fully explain whether YECL will proceed with the project if the YUB does not approve inclusion of this project in rates, with reasons for the YECL position.
- (f) Please fully discuss the nature of approval by the YUB. As an example, does the YUB approval determine which work should be done, or is the YUB approval just to set rates?
- (g) Please confirm that this project is part of a larger term project to convert diesel generation to Bi-Fuel generation. If not confirmed, please fully explain. If confirmed, please provide the long term plan for conversion of diesel generation to Bi-Fuel generation.
- (h) Please provide a schedule of operating times for LNG compared to diesel should the LNG proposal be approved.

- (i) Please provide an analysis that provides the reduction in carbon produced by the introduction of LNG.

Response:

- (a) The Watson Lake Bi-Fuel Project as presented in AEY's 2016-2017 General Rate Application is the current version of the project that was requested in the proceeding leading to Board Order 2014-06. Several changes to the commercial arrangements have occurred as described below in CW-YECL-3 (c) and (d) in response to the Board's concerns.
- (b) Please refer to CW-YECL-3(b) Attachment 1 for the Watson Lake Bi-Fuel Business Case #6 as filed in YECL's 2013-2015 GRA. Additional details were presented in Information Requests related to YECL's 2013-2015 GRA and YECL's Application for Review and Variance of Board Order 2014-06. The R&V application has been included in CW-YECL-3(b) Attachment 2.
- (c) From a technical standpoint, the projects are the same – a two phase conversion of diesel only generating units to Bi-Fuel operation with natural gas. AEY has performed conceptual engineering and design of the plant to refine estimated project costs. AEY will own all equipment associated with the project and contract directly with third parties for various services, eliminating any ongoing involvement of ATCO affiliates. It is expected that new LNG suppliers will be in the market by 2017, allowing for a competitive process to be performed.
- (d) Please refer to AEY's response to YUB-YECL-24(c).
- (e) AEY cannot speculate what it will do if the Project is not approved by the Board. Next steps related to this project would be dependent on the Board's reasons for such a decision. Although AEY believes it is able to spend the capital to build this or any project, not having the Board's approval to include the costs into rates but rather rely solely on the economic savings of doing the Project compared to the costs that are included in rates will lead to complicated analysis especially with respect to the treatment of fuel price variances and Rider F.
- (f) Please refer to AEY's response to CW-YECL-3(e).
- (g) AEY's objective is to ensure low cost of electricity for customers. The Watson Lake Bi-Fuel project will provide cost effective, baseload power to the Watson Lake grid. Following the successful implementation of this project, AEY will consider the integration of LNG into the other diesel powered communities we provide service to. However, the most cost effective technology will be selected

to provide reliable electricity to rate payers – be it renewable, with or without storage, alternative energy or LNG. A business case for each project will be presented to the YUB relative to the status quo – diesel generation.

- (h) The operating or dispatch model will be similar to what occurs in Watson Lake currently under a diesel-only regime. The units will be dispatched to meet load according to the current protocols at Watson Lake. AEY expects LNG to displace some amount of diesel during all hours of the year. With Bi-Fuel capability, approximately 50% of the total annual consumption of diesel will be displaced by LNG.
- (i) AEY presented an emissions study in response to YCS-YECL-2-1, as part of YECL's 2013-2015 GRA which has been provided as CW-YECL-3(i) Attachment 1. This study provided expected emissions associated with this project. The conclusion of this study is that the emissions resulting from this project will fall well within Yukon Environments emissions requirements. Emissions testing will be included in Phase 1 of the project to verify the predicated emissions.



The Yukon Electrical Company Limited
An **ATCO** Company

Business Case #6

Watson Lake Bi-Fuel Project



The Yukon Electrical Company Limited
An **ATCO** Company

Title: **Watson Lake Bi-Fuel Project**

Summary:

Phase 1 of the project (2013) involves the modification of Watson Lake power plant generation Unit #5 to a bi-fuel system which allows the unit to run on a combination of diesel and natural gas (NG). The purpose of this phase is to verify that NG injection into the engine provides reliable electricity generation for a utility power system along with the environmental benefit to reduce emissions. Phase 2 of the project (2014) will convert the remaining 5 units at the Watson Lake power plant to bi-fuel operation.

Diesel fuel is utilized for fossil fuel power generation when cleaner burning natural gas is not available. As natural gas is currently unavailable through direct pipeline, the fuel will be supplied by a truck transporting Liquefied Natural Gas (LNG) to the Watson Lake power plant. The availability of LNG allows for reduced emissions in existing generating units through the displacement of diesel fuel. The project would seek to reach an average of 50% displacement of the amount of diesel fuel normally used.

This project will reduce the dependency of Watson Lake on a single fuel (diesel). In addition to the environmental benefits of this project to reduce emissions of particulate matter, sulfur oxides, nitrogen oxides and carbon dioxide, this initiative will assist in determining the operational and financial benefits of the use of LNG as an alternate fuel for electricity generation.

Project
Description:

The first phase of the project will modify Unit #5 through the installation of a bi-fuel system which allows natural gas to be added to the air intake upstream of the diesel turbo unit. The natural gas will be trucked to Watson Lake as LNG from a production facility near Delta, British Columbia in a specialized, low pressure, double-walled, well-insulated or vacuum jacketed vessel. Once on site, the LNG will be transferred to storage tanks until the LNG is required for use in the power plant. The LNG will then be re-gasified through a vaporization unit utilizing heat recovered from the power plant to accomplish the gasification. The resulting NG will be piped to the power plant for mixture with air and diesel fuel for combustion in the existing generating unit. These single fuel units still require a portion of the fuel to contain diesel for its lubricating and cooling characteristics as well as combustion.

Unit performance is anticipated to average a displacement of 50% of diesel fuel consumption. Emissions testing will be performed. An assessment of the condition of the unit will be carried out as part of Phase 1.



The Yukon Electrical Company Limited
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Project Cost:

Phase 1:

2012 - \$90,000 and 2013 - \$363,000 for infrastructure from the NG supply to the unit and to convert Unit #5 to bi-fuel operation.

2013 - \$222,000 for study costs incurred in 2012 and 2013 including consulting costs for feasibility, surveying, engineering, and acquisition of required permits and licenses (included in Schedule 8.8 and amortized over 10 years).

Phase 2:

2014 - \$372,000 to convert the remaining units to bi-fuel operation.

Business and Technical Drivers

Business Drivers:

- A primary objective of this project is to reduce emissions from the production of electricity, particularly in light of increased reliance on diesel.
- Deliver an environmental benefit to the community of Watson Lake through the reduction of emissions of particulate matter, SO_x, NO_x and CO₂.
- Reduce dependency on a single fuel (diesel).
- Facilitate implementation of an alternate energy project that utilizes existing electricity generation infrastructure.
- Pursue initiatives that reduce the cost of power production from diesel fueled generating facilities.
- Utilize a supplemental fuel technology that provides the operational ability for the existing power plant to seamlessly revert back to operating on 100% diesel.

Technical Drivers:

- The component technologies have been successfully used in on and off-grid applications such as for continuous and back-up power generation for oil and gas companies and commercial buildings.
- LNG is more widely available and is becoming a more utilized commodity for use in transportation and energy generation.
- Technology for the storage and re-vaporization of LNG has become more accessible and cost effective.
- The efficiencies of this technology are ready to be demonstrated by a utility for power generation in Northern Canada.



The Yukon Electrical Company Limited
An **ATCO** Company

Alternatives:

Alternative #1: Status quo; continue to generate power using only diesel. This would not address community and utility interest in reducing emissions related to power generation. This would also not address continued exposure to the increasing cost of diesel.

Alternative #2: Install a new dual fuel engine that runs on either 100% diesel or 100% NG. This would result in a project cost significantly higher than modifying the existing generating units.

Alternative #3: Modify existing generating units in a phased approach to utilize natural gas injection to displace the amount of diesel fuel used. This alternative minimizes the capital cost investment required by utilizing existing equipment and infrastructure while allowing optional flexibility to reliably revert back to full diesel operation.

Recommendation:

Proceed with Alternative #3 on a phased approach to convert one unit in the first phase to verify operational requirements then proceed with the second phase of the project to modify the remaining 5 units.

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Our File No.: 12276.97

October 27, 2014

Yukon Utilities Board
Box 31728
Whitehorse, YT
Y1A 6L3

Attention: Mr. Bruce McLennan
Board Chair

**Re: Yukon Electrical Company Limited
Application for Review and Variance of Board Order 2014-06**

Please find enclosed herewith the Application of Yukon Electrical Company Limited to Review and Vary Board Order 2014-06.

Should you have any questions regarding this matter, please do not hesitate to contact the undersigned.

Yours truly,

BENNETT JONES LLP



Loyola G. Keough

Counsel for Yukon Electrical Company Limited

LGK/cc
Enclosures

YUKON UTILITIES BOARD

IN THE MATTER OF the *Public Utilities Act*, RSY 2002, c. 186, as amended; and

AND IN THE MATTER OF Yukon Utilities Board Order 2014-06 dated April 23, 2014; and

AND IN THE MATTER OF the Reasons of the Yukon Utilities Board respecting The Yukon Electrical Company Limited's proposed Watson Lake bi-fuel project and related adjustments to Rider F, as set out in sections 10.8.2.1 and 4.2 of Appendix A to Board Order 2014-06;

AND IN THE MATTER OF the Reasons of the Yukon Utilities Board respecting the treatment of the cost of living adjustment component of The Yukon Electrical Company Limited's 2013-2015 pension expenses, as set out in section 5.4.1.2 of Appendix A to Board Order 2014-06;

AND IN THE MATTER OF the Reasons of the Yukon Utilities Board respecting The Yukon Electrical Company Limited's allowed return on equity for 2013-2015, as set out in section 8.1.1 of Appendix A to Board Order 2014-06;

AND IN THE MATTER OF the Reasons of the Yukon Utilities Board respecting The Yukon Electrical Company Limited's allowed capital structure for 2013-2015, as set out in section 8.1.3.1 of Appendix A to Board Order 2014-06

**APPLICATION FOR REVIEW AND VARIANCE OF BOARD ORDER 2014-06
BY THE YUKON ELECTRICAL COMPANY LIMITED**

October 27, 2014

I. INTRODUCTION

1. In Appendix A to Board Order 2014-06 (the "**Board Order**") regarding The Yukon Electrical Company Limited's ("**Yukon Electrical**")¹ 2013-2015 Phase 1 General Rate Application (the "**GRA**"), the Yukon Utilities Board ("**Board**" or "**YUB**");
 - (a) denied Yukon Electrical's proposals to include in rate base the capital costs of its proposed Watson Lake bi-fuel project² and associated operations and maintenance costs and to make related changes to the Rider F methodology³ (the "**Bi-Fuel Ruling**");
 - (b) directed Yukon Electrical to reduce the cost of living adjustment ("**COLA**") component of its defined benefit ("**DB**") pension expense (the "**COLA Costs**") from 100 to 50 percent of CPI (up to 3%) (the "**COLA Ruling**");⁴
 - (c) denied Yukon Electrical's request for a 46 basis point equity risk premium on top of the British Columbia Utilities Commission ("**BCUC**") benchmark return on equity ("**ROE**") (the "**ROE Ruling**");⁵ and
 - (d) denied Yukon Electrical's request for a 4% increase to its common equity ratio (the "**Equity Ratio Ruling**").⁶(collectively, the "**GRA Rulings**")
2. Yukon Electrical respectfully submits that the Board committed errors of fact, law and/or jurisdiction which raise substantial doubt as to the correctness of the GRA Rulings. Additionally, there have been fundamental changes in circumstances and/or facts since the Board Order that could lead the Board to alter the GRA Rulings. The specific errors and the new facts are discussed below.
3. Accordingly, Yukon Electrical hereby applies, pursuant to section 62 of the *Public Utilities Act*, RSY 2002, c. 186 ("**Act**" or "**PUA**") and rule 31 of the Board's *Rules of Practice* ("**Board Rules**"), to review and vary the GRA Rulings. Having regard for the test for a review and variance ("**R&V**") application (as discussed below in Section II), Yukon Electrical submits that the Board should:
 - (a) vacate the Bi-Fuel Ruling (as discussed below in Section III);

¹ Yukon Electrical notes that by its April 4, 2014 filing of a Declaration of Use form with the Yukon Community Services' Corporate Affairs group pursuant to subsection 87(1) of the *Partnership and Business Names Act*, R.S.Y. 2002, c. 166, it is legally permitted to carry on business as ATCO Electric Yukon. For the purposes of this Application, however, Yukon Electrical has continued to refer to itself as Yukon Electrical.

² Appendix A to Board Order 2014-06, s. 10.8.2.1

³ Appendix A to Board Order 2014-06, s. 4.2

⁴ Appendix A to Board Order 2014-06, s. 5.4.1.2; the Board also directed Yukon Electrical to adjust its DB pension funding requirement forecast accordingly.

⁵ Appendix A to Board Order 2014-06, s. 8.1.1

⁶ Appendix A to Board Order 2014-06, s. 8.1.3.1

- (b) vacate the COLA Ruling (as discussed below in Section IV); and
- (c) vary the ROE Ruling and Equity Ratio Rulings (as discussed below in Section V).

II. THE R&V TEST

- 4. The grounds that the Board will consider for R&V of a Board Order include:
 - (a) an error in jurisdiction, fact or law; and
 - (b) a fundamental change in circumstances or facts since the decision or order.⁷
- 5. The Board uses a "two-phase system" for R&V applications.⁸ The first phase is an "initial screening" where the applicant must establish a "prima facie case" sufficient to warrant full consideration by the Board. For errors, the applicant must show the claim or error is substantiated on a *prima facie* basis and the error has significant material implications.⁹ If the first phase is satisfied, the second phase is a review on the merits (using a process to be determined by the Board).
- 6. Yukon Electrical submits that this Application establishes a prima facie case for the Rulings to be reviewed by the Board.

III. THE BI-FUEL RULING

A. Background

- 7. On May 27, 2013, Yukon Electrical filed the GRA. Yukon Electrical's capital expenditure forecast for the test period included \$735,000 of costs¹⁰ associated with Yukon Electrical's Watson Lake Bi-Fuel Project (the "**Bi-Fuel Project**") Yukon Electrical's operations and maintenance expense forecast for the test period included \$616,000 of costs associated with the Bi-Fuel Project for the lease of a storage and vaporization skid from ATCO Gas.¹¹
- 8. The Bi-Fuel Project was described in Business Case #6 (part of the GRA). Further details regarding the Bi-Fuel Project were also provided in Yukon Electrical's responses to intervener information requests,¹² as well as Yukon Electrical's Updates Filing dated October 31, 2013.

⁷ Board Rules, s. 31(1)

⁸ Board Rules, s. 31(3)

⁹ Board Rules, s. 32(5)

¹⁰ \$363,000 for 2013 (GRA, page 9-44); \$372,000 for 2014 (GRA, page 9-54)

¹¹ \$88,000 for 2013, \$264,000 for 2014, \$264,000 for 2015 (GRA, Schedule 5.3)

¹² YUB-YECL-6; YUB-YECL-31; YUB-YECL-39; YUB-YECL-42; YUB-YECL-61; CW-YECL-6; CW-YECL-8; CW-YECL-14; LE-YECL-18; UCG-YECL-16; UCG-YECL-17; UCG-YECL-19; UCG-YECL-35; UCG-YECL-68; UCG-YECL-75; UCG-YECL-82; UCG-YECL-104; YCS-YECL-2-1; YEC-YECL-15

9. In sum, the Bi-Fuel Project involved the modification of Watson Lake power plant generation units, which currently run on diesel, to a bi-fuel system that can run on a combination of diesel and natural gas (or just diesel).
10. The reduced diesel consumption enabled by the Bi-Fuel Project was expected to produce environmental benefits in the form of reduced emissions of particulate matter, SO_x, NO_x and CO₂. The Bi-Fuel Project was also expected to result in economic benefits for ratepayers. Yukon Electrical's model predicted cumulative fuel savings beginning in 2017 and a simple project payback of 9 years.¹³ The estimated life of the Bi-Fuel Project is 20 years. Therefore, substantial positive benefits to customers were expected to be derived over the life of the Bi-Fuel Project.
11. The Bi-Fuel Project was proposed in two-phases. In Phase 1, one unit would undergo modifications required to permit the use of liquefied natural gas ("LNG"), as well as diesel fuel. If Phase 1 was successful, the remaining five units would also undergo similar modifications. The phased approach would allow Yukon Electrical, after Phase 1, to assess the condition of the modified unit and verify that the modifications provided reliable electricity generation while reducing emissions. The phased approach would also allow Yukon Electrical to confirm the extent of environmental benefits and reduced diesel consumption from the Bi-Fuel Project, and hence confirm the expected economic benefits to customers from the Bi-Fuel Project.¹⁴
12. The Bi-Fuel Project involved the use of LNG transported to Watson Lake by truck because natural gas is not available through direct pipeline in Watson Lake.¹⁵ Yukon Electrical was able to procure through competitive processes the supply and transportation of LNG.¹⁶
13. The use of LNG in Watson Lake required the development of an on-site LNG facility for storage and vaporization services. The facility would be comprised of on-site storage, an LNG vaporizer and controls, a natural gas odourizer, and metering and safety systems.
14. Yukon Electrical determined that it would be prudent to obtain the storage and vaporization services — i.e. the LNG facility equipment, and related operations and maintenance services — through a lease arrangement with ATCO Gas, rather than purchasing the equipment outright and otherwise obtaining the related operations and maintenance services. ATCO Gas was selected because a competing lease provider was not in the market when the Bi-Fuel Project was being developed (in 2012). Notably, there was very little long-term cost difference (from a revenue requirement perspective) between the lease structure and a purchase structure, and the lease also offered additional benefits that included:

(a) avoiding an upfront capital commitment in the LNG Facility;

¹³ YUB-YECL-42(a)
¹⁴ Business Case #6, page 2
¹⁵ Business Case #6, page 2
¹⁶ Business Case #6, page 2; CW-YECL-8(c)

- (b) allowing Yukon Electrical to exit the project if Phase 1 was not successful (without having invested the full capital in the LNG Facility);
 - (c) providing cost certainty in relation to LNG Facility services costs, allowing the project to achieve fuel cost savings;
 - (d) allowing Yukon Electrical to obtain the LNG Facilities and related services from an inclusive expert provider of natural gas rather than a consortium of consultants and equipment and service providers.¹⁷
- 15. In connection with the Bi-Fuel Project, Yukon Electrical also proposed changes to its Rider F methodology (to account for the addition of LNG capability on Yukon Electrical's diesel units in Watson Lake to bi-fuel).¹⁸
- 16. In the Board Order, the Board cited two concerns in connection with the Bi-Fuel Ruling, namely:
 - (a) the Board questioned the lease costs because of the lack of a competitive tender process for the storage and vaporization services; and
 - (b) the Board appeared to question the forecasted nine-year Bi-Fuel Project payback based on the lack of competition in the LNG supply market.¹⁹
- 17. The Board also recognized, however, that the Bi-Fuel Project "has the potential to be viable in the future".²⁰

B. Grounds for R&V

- 18. As explained below, Yukon Electrical submits that the Board should reconsider the Bi-Fuel Ruling because of fundamental changes in circumstances or facts that have occurred since the Board Order.
- 19. Specifically, the LNG market has developed sufficiently to enable:
 - (a) validation of the Bi-Fuel Project lease costs using competitive tendering, which demonstrates that the Bi-Fuel Project costs are at fair market value; and
 - (b) a more conclusive understanding of how the benefits of the Bi-Fuel Project will be assessed and determined, as evidenced by the Board's recommended approval of the Yukon Energy Corporation ("YEC") Whitehorse Diesel to Natural Gas Conversion Project ("YEC Project").

¹⁷ YUB-YECL-6(i); CW-YECL-8; Yukon Electrical Written Argument, paragraphs 109-110
¹⁸ Appendix A to Board Order 2014-06, page 19, section 4.2
¹⁹ Appendix A to Board Order 2014-06, page 82
²⁰ Appendix A to Board Order 2014-06, page 61

i. Developments in the LNG supply infrastructure market have allowed Yukon Electrical to validate Bi-Fuel Project costs

20. The LNG supply infrastructure market in Western Canada was at a relatively nascent stage of development when Yukon Electrical began developing the Bi-Fuel Project in 2012. For example, when Yukon Electrical was responding to intervener information requests, "[a] competing lease provider [for the LNG storage and vaporization services] was not in the market".²¹ The market has evolved since that time. Most significantly, several competing providers of LNG storage and vaporization services are now active in the market.
21. The evolution of the market has enabled Yukon Electrical to conduct a robust competitive tender process to evaluate alternatives to the lease option for the Bi-Fuel Project. Yukon Electrical retained Jenmar Concepts ("Jenmar"), an independent expert engineering firm, as an independent third party to provide management and development of a competitive tender process for the LNG storage and vaporization services/equipment required for the Bi-Fuel Project, as well as to assist with the evaluation the bids received through that process. Among other things, Jenmar assisted with the development of the actual bid process, the bid documents and the evaluation criteria and associated weightings for the assessment of bids received through the process.
22. The bid process consisted of the following:
 - (a) On June 10, 2014, a request for information was issued to thirteen potential bidders;
 - (b) On July 9, 2014, a request for proposals was issued to fourteen potential bidders;
 - (c) Bids were to be evaluated based on the following criteria:
 - (i) Experience and Ability (What level of experience and ability does the bidder possess in executing similar or related projects?) – 10%;
 - (ii) Technical Proposal (Does the bidder have a good understanding of the technical requirements? Does the technical proposal meet the requirements as specified? Has the bidder provided a full description of its technical proposal as specified in the request for proposal?) – 10%;
 - (iii) Maintenance and Support (How much skill and experience does the bidder have in maintaining and supporting the operation of small LNG facilities? How much Canadian experience is possessed? What is the level of service and capability being offered?) – 20%; and

²¹

(iv) Cost (What is the bidder's overall cost, including installed equipment cost and expected 10 year maintenance cost of the facility? The lowest cost proposal was deemed the benchmark and received the full weighting for this criteria, while the higher cost proposals were awarded a prorated value based on the percentage difference over the benchmark cost.) – 60%;

(d) On July 30, 2014, proposals were received from three bidders: ATCO Gas as well as two unrelated parties, Bidder B and Bidder C;²²

(e) On August 25, 2014, a request for additional information regarding the annual maintenance costs was sent to the three bidders; replies were received on August 29, 2014.

23. A summary of the three proposals is provided in Table 1:

Table 1 – Summary of LNG Storage and Vaporization Equipment Bid Proposals Received

Description	ATCO Gas	Bidder B	Bidder C
Offering Summary	Equipment Sales & Turn-Key Installation – Civil, Mechanical and Electrical Complete	Equipment Sales & Turn-Key Installation – Civil, Mechanical and Electrical Complete	Equipment Sales & Turn-Key Installation – Civil, Mechanical and Electrical Complete
Overall Evaluation of Technical Proposal	Excellent	Excellent	Excellent
Total Installed Construction/Capital Cost	\$2,025,100	\$2,700,500	\$2,446,837
Schedule	Equipment delivery in 9 weeks. Installation during 2015 construction season.	Operational by August 13, 2015	Operational by August 24, 2015
Leasing			
Leasing Option	Yes	No	No
Lease Term	20 years	n/a	n/a
Lease Cost	\$22,000 per month	n/a	n/a
Cost Adjustments	CPI (Bank of Canada) adjustments after 1 st year	n/a	n/a

²²

Certain commercially sensitive information (e.g. the identity of bidders and bid pricing) has been excluded from this Application as it was provided to Yukon Electrical in confidence pursuant to the terms of the bid process, and it is Yukon Electrical's understanding that public disclosure of that information would likely result in material prejudice to the competitive position of those bidders as well as material prejudice to Yukon Electrical's ability to conduct future competitive bid processes.

Description	ATCO Gas	Bidder B	Bidder C
Maintenance			
Scheduled Interval	quarterly	quarterly	quarterly
10 Year Maintenance Cost	\$448,938	\$1,650,000	\$1,320,000

24. The bids were evaluated by Jenmar and Yukon Electrical using the pre-selected criteria as summarized in Table 2:

Table 2 – Evaluation of LNG Storage and Vaporization Equipment Bid Proposals

Criteria	ATCO Gas	Bidder B	Bidder C
Experience and Ability	6	10	10
Technical Proposal	10	10	10
Maintenance and Support	14	20	18
Cost	60	34	39
Total Score	90	74	77

25. The results of the competitive tender process show that procuring the equipment from ATCO Gas is the most economic option available for Yukon Electrical to obtain the storage and vaporization services. In Attachment 1 to this Application, Yukon Electrical has provided a cumulative present value model comparing the cost of leasing versus purchasing the equipment from ATCO Gas over a ten year period. The present value of the purchase option is slightly lower (\$1,826,424) than the present value of the lease option (\$1,859,113) over ten years. Further into the future, the present value of the purchase option would continue to be even more favorable to the leasing option.
26. Yukon Electrical had originally proposed in its GRA to lease the equipment for Watson Lake as, at the time the project was originally planned, there was no competitive market for LNG equipment and services and Yukon Electrical did not know if such equipment could be re-sold if the project was not successful. However, the circumstances in the market have changed and now, numerous LNG projects are under development. Comparing the cost of purchasing equipment based on the competitive supply and install bids versus the one lease bid received, Yukon Electrical now believes that it is advantageous to ratepayers to purchase rather than lease the equipment. As well, as a result of the development of the market, Yukon Electrical is now confident that it would be able to re-sell the storage and vaporization equipment if the project did not proceed past the pilot stage. However, the lease option is still available, though at a slightly greater 10 year cost, if the Board is does not agree that purchasing the equipment is the best option.

27. In Yukon Electrical's submission, this fundamental change in circumstances or facts fully addresses the Board's first concern with respect to the Bi-Fuel Project (i.e. the concern regarding the Bi-Fuel Project lease costs).

ii. The benefits of the Bi-Fuel Project are now better understood

28. On the face of the Board Order, the lack of competition in the LNG supply market at the time of the GRA appears to have created uncertainty with respect the economic benefits of the Bi-Fuel Project. More specifically, the Board appears to have questioned whether the forecasted nine-year simple Bi-Fuel Project payback period would materialize.
29. However, on May 14, 2014, the Board issued its Report on the YEC Project (the "**YEC Project Report**"),²³ in which the Board recommended that the Yukon Minister of Justice approve the YEC Project.
30. The YEC Project involves the replacement of two diesel-generating units at YEC's Whitehorse thermal generation station with up to three new modular natural gas-fired generating units supplied by LNG, and the installation of an LNG facility at the station (similar to the one required in relation to Yukon Electrical's Project), with an estimated capital cost of \$38.8 million.²⁴ Notably, YEC proposed to obtain LNG supply from the FortisBC plant in Delta, BC²⁵ — the same source Yukon Electrical proposed to use for its Bi-Fuel Project.
31. In the YEC Project Report, the Board (among other things):
- (a) accepted evidence that showed the continuation of a spread of prices between crude oil and natural gas, and by extension, between the price of diesel and LNG;
 - (b) recognized that although the continuance of a crude oil and natural gas price spread may not be guaranteed, the risk of the spread closing is low;
 - (c) found that while gas prices may be volatile, there is no evidence showing the elimination of the oil-gas price spread nor any evidence indicating that oil prices are any more stable than gas prices, or more particularly, LNG and diesel prices;
 - (d) accepted that further potential savings on LNG transportation costs if it is supplied from LNG facilities proposed to be developed in locations closer to Whitehorse than Delta, BC (such as Dawson Creek or Fort Nelson);²⁶

²³ YUB Report to Yukon Minister of Justice – Yukon Energy Corporation for Energy Project Certificate And Energy Operation Certificate Regarding the Proposed Whitehorse Diesel to Natural Gas Conversion Project (May 14, 2014) ("**YEC Project Report**")

²⁴ YEC Project Report, page 2

²⁵ YEC Project Report, page 19

²⁶ YEC Project Report, page 25

- (e) accepted the likelihood of more LNG facilities coming on-stream in the near term that would provide additional LNG supply options for use in the Yukon;²⁷ and
- (f) accepted YEC's forecast assumptions in finding that the YEC Project would result in savings to customers of \$700,000 in 2016, increasing to \$2.1 million by 2018.²⁸ Thus, the new evidence and facts that were adduced during the YEC Project proceeding allowed the Board to make a conclusive determination on the potential economic benefits to ratepayers of the YEC Project and to recognize the ongoing development the LNG supply market.
32. In Yukon Electrical's submission, these new considerations warrant reconsideration of the Bi-Fuel Project by the Board. When the Bi-Fuel Project is evaluated using the same circumstances and considerations applied to the YEC Project, the benefits of the Bi-Fuel Project are more certain, and are greater.
33. In Attachment 2 to this Application, Yukon Electrical has provided an updated economic model for the Bi-Fuel Project, using the same assumptions that were used by YEC for the YEC Project and accepted by the Board in the YEC Project Report. The model forecasts net savings to ratepayers arising from the Bi-Fuel Project of \$2.4 million for the period 2015-2019. Attachment 2 thus demonstrates that the Bi-Fuel Project will result in significant benefits to customers based on the assumptions that have recently been accepted by the Board.
34. The following comparison of Yukon Electrical's Bi-Fuel Project with the YEC Project demonstrates that approval of the Bi-Fuel Project is appropriate in light of the Board's approach in the YEC Project Report:

Table 3 – Comparison of Yukon Electrical Bi-Fuel Project to YEC Project

Yukon Electrical Bi-Fuel Project	YEC Project
Savings to customers of \$0.3 million in 2016, increasing to \$0.7 million by 2018	Savings to customers of \$0.7 million in 2016, increasing to \$2.1 million by 2018 ²⁹
Total capital cost of \$2.85 million (includes the purchase of storage and vaporization from ATCO Gas) ³⁰	Total capital cost of \$38.8 million ³¹
Plan to source LNG from Tilbury FortisBC Plant, with option to obtain from newer facilities	Plan to source LNG from Tilbury FortisBC Plant, with option to obtain from newer facilities
All costs (including LNG supply, transportation and storage and vaporization) competitively tendered	All costs (including LNG supply, transportation and storage and vaporization) competitively tendered

²⁷ YEC Project Report, page 28

²⁸ YEC Project Report, page 48

²⁹ *Ibid.*

³⁰ \$90,000 for 2012 (GRA, page 9-35); \$363,000 for 2013 (GRA, page 9-44); \$372,000 for 2014 (GRA, page 9-54); purchase of storage and vaporization equipment of \$2,025,100 (paragraph 23)

³¹ YEC Project Report, page 2

Yukon Electrical Bi-Fuel Project	YEC Project
Enables use of natural gas to reduce emissions, but retains optionality for reliance on diesel if LNG not available or diesel-LNG spread closes unexpectedly	No optionality for reliance on diesel if LNG not available or diesel-LNG spread closes unexpectedly

35. Yukon Electrical remains committed to the Bi-Fuel Project and continues to believe that the Bi-Fuel Project will result in material environmental benefits for the community of Watson Lake as well as economic benefits for ratepayers. In Yukon Electrical's submission, the changes in circumstances and facts since Board Order 2014-06 fully address the two reasons cited by the Board for the Bi-Fuel Ruling. Having regard for current circumstances, the substantial benefits of the Bi-Fuel Project for ratepayers are readily apparent.
36. Accordingly, Yukon Electrical respectfully requests that the Board:
- (a) vacate the Bi-Fuel Ruling;
 - (b) allow Yukon Electrical to include in rate base the capital costs and associated operations and maintenance costs of the Bi-Fuel Project; and
 - (c) approve the related changes the Rider F methodology proposed by Yukon Electrical (as outlined in section 4.2 of the Appendix A to the Board Order).

IV. THE COLA RULING

A. Background

i. The COLA Ruling

37. The COLA Costs were not put in issue during the written evidentiary portion of the GRA proceeding. No intervenor asked any information requests regarding the appropriateness of inclusion of the full COLA Costs in rates, nor did any intervenor file any evidence to support a claim that the full COLA Costs were unreasonable or imprudent.
38. The first indication that a party would advocate for the disallowance of some of the COLA Costs occurred during cross-examination, when counsel for the City of Whitehorse asked Yukon Electrical to provide an estimate of Yukon Electrical's DB pension special funding payments using an actuarial assumption of 50% of CPI.³²
39. Yukon Electrical gave an undertaking in response to that question, and later provided Response to Undertaking #3 in fulfillment of that undertaking. Because no party had previously suggested disallowance of the COLA Costs, Yukon Electrical provided additional new evidence in Response to

³² Yukon Electrical 2013-2015 GRA Proceeding Transcript Volume 1, page 84, lines 3-7

Undertaking #3 (collectively, the "**New Pension Evidence**") demonstrating the reasonableness and prudence of the full COLA Costs and supporting inclusion of the full COLA Costs in rates. Specifically, the New Pension Evidence demonstrated the prudence of the full COLA Costs by:

(a) showed that Yukon Electrical would be required by law to pay the full COLA Costs (i.e. COLA based on 100% of CPI up to 3%); and

(b) demonstrated the prudence of the full COLA Costs by:

(i) showing that a COLA based on 100% of CPI was consistent with the COLA awarded by other employers in the Yukon such as the Yukon Government and YEC; and

(ii) providing an independent, market-based assessment prepared by Mercer (Canada) Limited of total compensation (including pension compensation) paid by the ATCO Utilities, including Yukon Electrical, demonstrating that Yukon Electrical's total compensation is generally market competitive but fell 3% short of Target Total Remuneration — i.e. was below median compensation) (the "**Mercer Comp Study**").

40. In Final Argument, the City of Whitehorse requested that the Board "only include pension funding based on 50% of CPI for the forecast period."³³ The City's request in that regard was based solely on the determinations of the Alberta Utilities Commission ("**AUC**") in Decision 2011-391³⁴ (and the review and appeal decisions relating to that decision).³⁵ Notably, the AUC's determinations were concerned solely with the Alberta ATCO Utilities' 2012 COLA expenses, not Yukon Electrical's 2013-2015 COLA Costs. The AUC's determinations for 2012 were also rendered without the Mercer Comp Study, or equivalent evidence.

41. The New Pension Evidence was unchallenged, both in evidence and in argument. No evidence was put on the record of the Yukon Electrical GRA proceeding to suggest that the COLA Costs would be imprudent.

42. Notwithstanding that, the Board accepted the City of Whitehorse's argument and made the COLA Ruling, disallowing the COLA Costs. The only rationale provided by the Board for the COLA Ruling was the following:

The Board notes CW's submissions that the YECL's COLA adjustment is not in keeping with the Alberta Utilities Commission decision discussed at length above. Considering that the findings of the Commission on COLA adjustment are on the same pension plan in question in this proceeding, the Board reduces the COLA adjustment from 100 percent to 50 percent and orders YECL to adjust its

³³ Final Argument of the City of Whitehorse, paragraph 18

³⁴ AUC Decision 2011-391, ATCO Utilities 2011 Common Pension Matters (September 27, 2011) ("**Decision 2011-391**")

³⁵ Final Argument of the City of Whitehorse, paragraph 18

defined benefit pension funding requirement forecast accordingly and to reflect these findings in the compliance filing.³⁶

43. Based on current forecasts of pension funding requirements, the COLA Ruling will have a material impact on Yukon Electrical, as it would result in a disallowance of \$1,937,000³⁷ of Yukon Electrical's costs over the GRA test period.

ii. AUC Decision 2011-391

44. Given the COLA Ruling's reliance on AUC Decision 2011-391, it is also important to understand the full context of that decision.
45. Yukon Electrical's parent company, Canadian Utilities Limited ("**CU**"), sponsors two pension plans (the "**CU Pension Plans**"): Plan 1 (defined benefit and defined contribution) (the "**CU Pension Plan 1**") and Plan 2 (defined benefit only) (the "**CU Pension Plan 2**"). Employees of the Alberta ATCO Utilities participate in CU Pension Plan 1, while Yukon Electrical employees who are members of the defined benefit plan participate in CU Pension Plan 2. CU exercises its oversight responsibilities for both CU Pension Plans through a Board committee (the "**Pension Plan Administrator**").
46. The only difference between CU Pension Plan 1 and CU Pension Plan 2 is related to the regulation of the two plans. CU Pension Plan 1 is registered in Alberta and, accordingly, is governed by the Alberta Employment Pensions Plans Act and administered and enforced by the Office of the Alberta Superintendent of Pensions in the Employment Pensions Branch in Alberta Treasury Board and Finance. CU Pension Plan 2 is registered federally and, accordingly, is governed by the Pensions Benefits Standards Act, 1985 and administered and enforced by the Office of the Superintendent of Financial Institutions ("**OSFI**").
47. Yukon Electrical has no control over management of the CU Pension Plans (nor do the ATCO Utilities). The CU Pension Plans are also the subject to a variety of fiduciary and legal obligations. The assets of each CU Pension Plan are pooled between the participating companies, and the balance sheet and funding requirements for each plan are determined on an aggregated basis. Costs for CU Pension Plan 2 are allocated to Yukon Electrical based on the proportion of its member liabilities.
48. From 1996 to the end of 2006, CU Pension Plan 2 was in a surplus position. As a result, Yukon Electrical was not required to make employer contributions during this time. Plan members continued to make individual contributions throughout this period. Yukon Electrical's ratepayers were the sole beneficiary of the contribution holiday over this entire period, as no amounts relating to pension costs were needed to be collected from customers through rates.

³⁶ Board Order 2014-06, Appendix A, s. 5.4.1.2

³⁷ \$589,000 for 2013, \$674,000 for 2014, \$674,000 for 2015 (Compliance Filing, Page 9 of 16)

49. On July 10, 2009, the ATCO Utilities filed an application with the AUC to address their funding obligations to CU Pension Plan 1. In the resulting decision, Decision 2010-189,³⁸ the AUC approved the funding request, but noted that CU Pension Plan 1 included a provision that requires the CU Pension Plan Administrator to determine an annual amount for the COLA, subject to a 3% per annum ceiling.³⁹
50. In Decision 2010-189, the AUC indicated that a change to the practice regarding the annual COLA amount represented a possible means of mitigating the CU Pension Plan 1 deficit (so as to reduce the amounts ultimately collected from ratepayers). The AUC stated that it intended to investigate the possibility of adjusting COLA as a mechanism to manage increased utility pension expense. While approving the pension expenses considered in Decision 2010-189, the AUC directed the ATCO Utilities to file a 2011 pension application and, in doing so, address certain issues relating to a potential COLA adjustment.⁴⁰
51. On December 15, 2010, the ATCO Utilities filed the 2011 Pension Common Matters Application. That application was in response to the direction of AUC in Decision 2010-189. In that application, the ATCO Utilities presented evidence that the CU Pension Plan 1 costs were below the median when compared to other utilities, and that overall compensation inclusive of pension benefits was also at or below labour market comparables. With respect to COLA specifically, the evidence presented by Mercer indicated that only one of the twelve members of the comparator group had a COLA level as low as 50%. In fact, none of the members of the comparator group set a maximum cap for COLA as low as 3%.
52. On September 27, 2011, the AUC issued Decision 2011-391. The AUC denied recovery of the full amounts which were determined by the CU Pension Plan Administrator to be necessary by reducing the COLA portion of pension expenses to 50% of CPI, instead of 100% of CPI, to a maximum of 3% as previously allowed.
53. The ATCO Utilities filed a R&V application in relation to Decision 2011-391. On March 22, 2012, the AUC issued Decision 2012-077⁴¹ wherein it denied that R&V Application. In denying the R&V application the AUC acknowledged that it had made no determination concerning the prudence of the Pension Plan Administrator's determination regarding the COLA amount for the CU Pension Plan.⁴²
54. On September 23, 2013, the Alberta Court of Appeal dismissed the ATCO Utilities' appeal from AUC Decision 2011-391 (the "**Alberta Pension**

³⁸ AUC Decision 2010-189: ATCO Utilities – Pension Common Matters (April 30, 2010)

³⁹ AUC Decision 2010-189, paragraphs 107-108

⁴⁰ AUC Decision 2010-189, paragraphs 116-124

⁴¹ AUC Decision 2012-077: ATCO Utilities (ATCO Gas, ATCO Pipelines, and ATCO Electric Ltd.) – Decision on Request for Review and Variance of AUC Decision 2011-391 ATCO Utilities 2011 Pension Common Matters (March 22, 2012)

⁴² AUC Decision 2012-077, paragraph 42

Appeal").⁴³ However, on April 10, 2014, the Supreme Court of Canada ("**SCC**") granted leave to appeal from the Alberta Pension Appeal.⁴⁴ The appeal (the "**SCC Pension Appeal**") is scheduled to be heard by the SCC in December 2014, and a decision of the SCC is anticipated in 2015.

B. Grounds for R&V

55. Yukon Electrical respectfully submits that the Board should reconsider the COLA Ruling because it was premised on errors of fact, law and/or jurisdiction which raise substantial doubt as to the correctness of the COLA Ruling. Specifically, in denying the COLA Costs:

(a) the Board committed errors of law or jurisdiction by failing to consider the prudence of those costs and the presumption of prudence;

(b) the Board committed an error of law or jurisdiction by failing to assess the prudence of the COLA Costs independently of the potential impact on ratepayers; and

(c) the Board committed an error of law by overlooking the New Pension Evidence.

56. Each of those points is explained below in Subsection IV.B.i through IV.B.iii, respectively. Following that, the significant material implications of the errors underlying the COLA Ruling are discussed in Subsection IV.B.iv.

i. The Board committed errors of law or jurisdiction by failing to consider the prudence of those costs and the presumption of prudence

57. A utility has a common law right to recover its prudently incurred costs.⁴⁵ There is also a well established "presumption of prudence", under which a utility's costs are considered prudent unless evidence to the contrary on the record exists.⁴⁶

⁴³ *ATCO Gas and Pipelines Ltd. and ATCO Electric Ltd. v. Alberta (Utilities Commission)*, 2013 ABCA 310

⁴⁴ *ATCO Gas and Pipelines Ltd. and ATCO Electric Ltd. v. Alberta Utilities Commission and Office of the Utilities Consumer Advocate of Alberta*, Case No. 35624 (April 10, 2014)

⁴⁵ The Alberta Court of Appeal has ruled that the rate-setting tribunal in Alberta must "ensure that the utility has a reasonable opportunity to recover its costs, providing they are prudent": *ATCO Electric Ltd. v. Alberta (Energy and Utilities Board)*, 2004 ABCA 215, para. 131. In *Enbridge Gas Distribution Inc. v. Ontario (Energy Board)*, [2005] O.J. 756 (S.C.J.), at para. 8, the Ontario Superior Court of Justice held: "Essentially, a utility is entitled to recover its prudently incurred costs". The decision was reversed on appeal on other grounds; however, the Ontario Court of Appeal confirmed that the utility was entitled to recover its prudently incurred costs: [2006] O.J. No. 1355 (C.A.), at para. 11; leave to appeal ref'd [2006] S.C.C.A. No. 208. See also: *Natural Resource Gas Ltd. v. Ontario (Energy Board)*, [2006] O.J. No. 2961 (Ont. C.A.); *TransCanada PipeLines Ltd. v. Canada (National Energy Board)*, 2004 FCA 149, at para. 32.

⁴⁶ See e.g. *ATCO Electric Ltd. v. Alberta (Energy and Utilities Board)*, 2005 ABCA 122, at para. 66

58. The appropriate approach to prudence was summarized by the Ontario Court of Appeal in 2006 in *Enbridge Gas Distribution Inc. v. Ontario (Energy Board)*:⁴⁷

10 The approach of the OEB to the "prudence" inquiry is captured in the following extract from its reasons:

While the parties described it in somewhat varying terms, in the Board's view they were in substantial agreement on the general approach the Board should take to reviewing the prudence of a utility's decision.

The Board agrees that a review of prudence involves the following:

- *Decisions made by the utility's management should generally be presumed to be prudent unless challenged on reasonable grounds.*
- To be prudent, a decision must have been reasonable under the circumstances that were known or ought to have been known to the utility at the time the decision was made.
- Hindsight should not be used in determining prudence, although consideration of the outcome of the decision may legitimately be used to overcome the presumption of prudence.
- Prudence must be determined in a retrospective factual inquiry, in that the evidence must be concerned with the time the decision was made and must be based on facts about the elements that could or did enter into the decision at the time.

11 *Neither the Divisional Court nor either party to this appeal takes issue with the correctness of the above quoted passage from the OEB's reasons. The "prudence" inquiry described by the Board has two stages. At the first stage, the decision of Enbridge is presumed to have been made prudently unless those challenging the decision demonstrate reasonable grounds to question the prudence of that decision. At the second stage of the inquiry, reached only if the presumption of prudence is overcome, Enbridge must show that its business decision was reasonable under the circumstances that were known to, or ought to have been known to, Enbridge at the time it made the decision. [Emphasis added]*

59. Section 3 of the Rate Policy Directive (1995) annexed to Yukon O.I.C. 1995/090 ("OIC 1995/090") states:

Except to the extent otherwise stated by this Directive or the Act, the Board must review and approve rates in accordance with principles established in Canada for utilities, including those principles established by regulatory authorities of the Government of Canada or of a province regulating hydro and non-hydro electric utilities.

60. A utility's right to recover its prudently incurred costs, and the presumption of prudence, are principles that are well established in Canada for utilities. As noted above, those principles have been recognized by appellate courts in numerous

⁴⁷ *Enbridge Gas Distribution Inc. v. Ontario (Energy Board)*, [2006] O.J. No. 1355 (C.A.), at paras. 10-11

Canadian jurisdictions,⁴⁸ as well as regulatory authorities of the Government of Canada⁴⁹ and the provinces across Canada.⁵⁰ Accordingly, pursuant to section 3 of the OIC 1995/090, the Board is legally required to review and approve Yukon Electrical's rates in accordance with those principles. The COLA Ruling, however, was made without regard for those principles.

61. The Board does not appear to have considered whether the COLA Costs were prudently incurred. In the Board Order, the Board did not discuss the prudence of the COLA Costs, and the Board made no determination or finding on prudence (whether on the part of Yukon Electrical or the CU Pension Plan's administrator).
62. Also, the Board did not discuss the presumption of prudence, and made no determination or finding that would allow for it to disregard that presumption.
63. Rather, the COLA Ruling relied on determinations of the AUC in Decision 2011-391. The AUC made no determination or finding on prudence in Decision 2011-391, however. Decision 2011-391 does not once mention the concept of prudence in its analysis or conclusion. Additionally, and as noted above, in Decision 2012-077 the AUC recognized that it made no determinations in Decision 2011-391 regarding the prudence of the CU Pension Plan Administrator's determination regarding the CU Pension Plan COLA expenses. Furthermore, AUC Decision 2011-391 did not deal with the period 2013 – 2015 covered by the current GRA. Rather, Decision 2011-391 dealt with the 2012 test year and the pension costs related to that time period. As such, the findings of the AUC are not applicable to the specific period covered by the application that is currently before this Board. In this regard, it is of note that the AUC is currently considering a separate ATCO Utilities 2013 Pension Application, which has provided extensive new evidence to address the perceived shortcomings that led to Decision 2011-391. The ATCO Utilities are seeking COLA equal to 100% of CPC, to a maximum of 3%, for 2013 based on the evidence filed in this ongoing proceeding.
64. Before disallowing any portion of the COLA Costs, the Board was legally required to consider the prudence of those costs. The Board was also required to apply the presumption of prudence to those costs. The Board did neither. Consequently, Yukon Electrical respectfully submits that the Board erred in law or jurisdiction by issuing the COLA Ruling.

⁴⁸ See footnote 44 above

⁴⁹ See e.g. National Energy Board Reasons for Decision RH-2-2004, TransCanada PipeLines Limited Phase 1 (September 2004), page 34; National Energy Board Reasons for Decision RH-2-97, Westcoast Energy Inc. Tolls for 1997 to 2001 (August 2007), page 14

⁵⁰ See e.g. AUC Decision 2008-113, ATCO Gas 2008-2009 General Rate Application Phase 1 (13 November 2008), at paras. 48-49; British Columbia Utilities Commission Order G-36-12 regarding FortisBC Inc. Kettle Valley Distribution Source Project Commission Order C-5-06 for A Stage 2 Prudence Expenditure Inquiry Under Sections 59 and 60 of the *Utilities Commission Act* (12 March 2012); Ontario Energy Board Decision EB-2011-0432 (2 March 2012); Ontario Energy Board Decision RP-2001-0032 (December 13, 2002), at s. 3.2

65. The prudence issues raised by the COLA Ruling are essentially identical to those that will be considered by the SCC in the SCC Pension Appeal.⁵¹ This fact alone, in Yukon Electrical's submission, supports finding a *prima facie* case of error in relation to the COLA Ruling.
66. Accordingly, Yukon Electrical respectfully submits that the Board should proceed to the second phase of the R&V process and convene a review of the COLA Ruling on the merits. In the interests of efficiency, however, Yukon Electrical would propose that any second phase review of the COLA Ruling for R&V purposes be adjourned pending the release of the SCC's decision in the SCC Pension Appeal.
- ii. The Board committed an error of law or jurisdiction by failing to assess the prudence of the COLA Costs independently of the potential impact on ratepayers**
67. In Yukon Electrical's submission, it is an error of law to consider ratepayer impacts when assessing the prudence of a utility's costs. In *TransCanada Pipelines Ltd. v. Canada (NEB)* ("**TransCanada**"),⁵² the Federal Court of Appeal affirmed that where a regulator adopts a cost of service methodology, the prudent costs of service must be based on evidence, independent of the potential impact on rates. In that decision, Rothstein J.A. (now of the Supreme Court of Canada) agreed that "the impact of any resulting toll increase on customers or consumers is an irrelevant consideration" in determining what in, that case, was the cost of equity capital. Rather, there is a two-stage approach to setting just and reasonable rates, the first of which is the assessment of prudence. The impact on rates is then assessed on the second part of the just and reasonableness analysis in how rate increases, if any, are addressed.
68. It is clear from Decision 2011-391 (as well as Decision 2010-189) that the AUC's purpose in excluding from rates a portion of the Alberta ATCO Utilities' 2012 COLA expenses was to minimize the rate impact on Alberta ratepayers of the then current CU Pension Plan 1 deficit.

⁵¹ The ATCO Utilities sought — and were granted — leave to appeal to the Supreme Court of Canada from the Alberta appeal decision on the ground that the Alberta Court of Appeal "erred in upholding the AUC Decision in determining whether the ATCO pension COLA costs were prudently incurred", and that "the Court's error was in endorsing a regulatory approach which: (i) [f]ailed to consider and apply the presumption of prudence to the COLA costs; (ii) [a]ssessed the prudence of costs based on factors at the time of the rate application, rather than when the cost decision was made; and (iii) conflated the tests for recovery of prudently incurred costs and the setting of just and reasonable rates, and failed to assess prudence independently of the potential impact on ratepayers."

⁵² *TransCanada PipeLines Ltd. v. Canada (National Energy Board)*, 2004 FCA 149 [**TransCanada**], at para. 35; see also YEC-YECL-13(a) Attachment 1 (British Columbia Utilities Commission Order G-75-13, Generic Cost of Capital Proceeding (Stage 1) Decision (May 10, 2013), at pages (i) 12 [**BCUC Order G-75-13**] (where the British Columbia Utilities Commission determined that it does not consider rate impacts on ratepayers in determining a utility's fair return)); The Honourable J.C. Major and R. Priddle, "The Fair Return Standard for Return on Investment by Canadian Gas Utilities: Meaning, Application, Results, Implications" March 2008, at pages 9-10, online: Canadian Gas Association (accessed July 14, 2014) <http://www.cga.ca/resources/publications/policy-papers/> [**Major and Priddle**]

69. First, at paragraphs 77 and 78 of Decision 2011-391, the AUC commenced its reasons with the statement that the CU Pension Plan 1 had an unfunded liability of \$157.1 million (which required annual special payments starting in 2010) and the financial position of the plan had not improved as of December 31, 2010.
70. The AUC then went on to re-characterize the importance of an unfunded liability in terms of setting the COLA amount. Specifically, in paragraph 79 the AUC focused on the fact that the financial position of the CU Pension Plan 1 is one of the factors to consider in setting COLA. None of the other factors relevant in setting COLA were mentioned, however.
71. In the remainder of its reasons, the AUC also focused its discussion on the unfunded liability. More specifically, the AUC noted that a change in actuarial assumptions, including COLA amounts, would impact the unfunded liability amount,⁵³ and that such a change was warranted in the case of the Alberta ATCO Utilities so as to reduce the deficiency.⁵⁴ The AUC further noted at paragraph 84 of Decision 2011-391 that:

...a one per cent reduction of the COLA amount starting in 2011 ... would result in reducing the pension deficit by \$51 million, and reduce the special payment amount by \$5.4 million. Annual revenue requirement amounts for each of 2011 and 2012 would be reduced by \$2.8 million for AG, \$2.1 million for AE, and \$0.5 million for AP. A one per cent reduction would set the COLA at approximately 55 per cent of the CPI assumption used in the 2009 Actuarial Report.

72. To further support its position, the AUC again focused on the importance of reducing the unfunded liability in paragraph 87 of Decision 2011-391:

The reasonableness of the COLA amount must be evaluated in the circumstances applicable at the time that ATCO Utilities apply to include pension expense in revenue requirement. The current circumstances in respect of the existing pension cost placeholders include a significant unfunded liability that requires ratepayers to fund an allocated share of special payments. [Emphasis added.]

73. The AUC then concluded that a reduction in COLA was warranted for the Alberta ATCO Utilities.⁵⁵ The Commission appears to have confirmed its view that the existence of an unfunded liability is the driving factor in the COLA assessment when it stated:⁵⁶

At the time of the filing of the next valuation submission, the Commission will review all of the relevant circumstances, including the size of any unfunded liability, when considering any adjustment for regulatory purposes to the COLA amount used in determining the pension cost component of revenue requirement. In this context, the Commission will consider increasing the percentage of CPI included in the annual COLA amount included in pension expense should the current DB Plan unfunded liability significantly decrease. Similarly, the Commission will consider further decreasing the percentage of CPI

⁵³ AUC Decision 2011-391, paragraphs 80 and 81

⁵⁴ AUC Decision 2011-391, paragraphs 82-83

⁵⁵ AUC Decision 2011-391, paragraph 92

⁵⁶ AUC Decision 2011-391, paragraph 94

included in the annual COLA amount included in pension expense should the current DB Plan unfunded liability significantly increase.

74. In Yukon Electrical's respectful submission, the AUC's focus on the rate impacts on Alberta ratepayers from the Alberta ATCO Utilities' COLA expenses was inconsistent with the ruling in *TransCanada* and thus was an error of law. The AUC's approach in this regard will also be specifically considered by the SCC in the SCC Pension Appeal.⁵⁷
75. The COLA Ruling adopted the AUC's ruling. It follows, therefore, that the Board thereby committed an error of law by adopting the AUC's incorrect approach and basing the COLA Ruling on that approach.

iii. The Board committed an error of law by overlooking the New Pension Evidence or by arriving at findings not supported by the evidence

76. It is well established that:

a finding of fact which is unsupported by evidence is an error of law. So too, is a finding which overlooks or misapprehends relevant and conclusive evidence.⁵⁸

77. It is also trite law that an administrative tribunal, such as the Board, must base its decisions on the facts before it.⁵⁹ Moreover, a finding of fact, which is unreasonable, made without evidence, and/or made contrary to the evidence, constitutes an error of fact, law and/or jurisdiction.⁶⁰ As the Saskatchewan Court of Appeal has recognized, whether or not the standard of review is correctness or reasonableness, an essential finding made without evidence must result in a tribunal's decision being set aside.⁶¹
78. Board Order 2014-06 does not discuss the New Pension Evidence. There is no indication in the Board Order that the New Pension Evidence was specifically considered by the Board, other than the following general statement at the outset of the Board Order:

In reaching the determinations contained within this decision, the Board has considered all relevant materials of which the record of this proceeding is comprised, including the evidence and argument provided by each party. Accordingly, references in this decision to specific parts of the record are intended to assist the reader in understanding the Board's reasoning related to a particular matter and should not be taken as an indication that the Board did not consider all relevant portions of the record with respect to that matter.⁶²

⁵⁷ See footnote 44.

⁵⁸ *Yukon Energy Corporation and The Yukon Electrical Company Limited v. Yukon Utilities Board*, 1996 CanLii 2558 (YK CA), at para. 46

⁵⁹ See e.g. *Canadian Recording Industry Assn. v. Society of Composers, Authors & Music Publishers of Canada*, 2010 FCA 322

⁶⁰ See e.g. *R. v. Yurko*, [1999] A.J. No. 1359 (Q.B.), at para. 17, *Foothills Provincial General Hospital v. U.N.A. Local 15* (1993), 10 Alta. L.R. (3d) 254 (Q.B.), at 263-264

⁶¹ *Ecole St. Margaret School v. Prisciak*, 2013 SKCA 87, at para. 37

⁶² Appendix A to Board Order 2014-06, page 3

79. The New Pension Evidence demonstrated the reasonableness and prudence of the COLA Costs in a few different ways. It showed that the payment of a full COLA, i.e. at 100% of CPI (up to 3%), to Yukon Electrical DB pension plan members, was consistent with the comparable COLA payments made by the other comparable pension plans in the Yukon (including YEC's plan). Notably, that evidence was not before the AUC when it issued Decision 2011-391 (nor the related R&V decision). The Mercer Comp Study also showed that Yukon Electrical's overall compensation, including awarded COLA, was below market median levels. Again, this evidence was not before the AUC when it issued Decision 2011-391.
80. The New Pension Evidence was unchallenged. There was no evidence on the record to support a finding that Yukon Electrical's full COLA Costs were imprudent. The only available evidence — the New Pension Evidence — demonstrated that those costs were reasonable and prudent, and should therefore be allowed in rates. Notwithstanding the more recent evidence specifically focused on Yukon Electrical, however, the Board instead took as determinative the AUC's determinations in Decision 2011-391, which were rendered based on evidence with respect to 2011 forecasts relating to Alberta utilities that are separate entities from Yukon Electrical.
81. Thus, in Yukon Electrical's respectful submission, the COLA Ruling should be reviewed because it:
- (a) was made without evidence;
 - (b) was inconsistent with the New Pension Evidence — the only evidence on the record of the GRA proceeding relevant to the COLA Costs; and
 - (c) was unsupported by the evidence on the record of the GRA proceeding.

iv. The COLA Ruling errors have significant material implications

82. As outlined in paragraph 43 of this Application, the errors in the COLA Ruling will result in the disallowance of significant costs that Yukon Electrical will be required to incur. This alone demonstrates that the COLA Ruling errors have significant material implications for Yukon Electrical.
83. Additionally, Yukon Electrical and its shareholders rely on a utility's right to recover its prudently incurred costs in making investment decisions. Therefore, any regulatory precedent that supports the disallowance of utility costs, without regard for the prudence of those costs, has significant material implications for Yukon Electrical and its shareholder.

V. THE ROE AND EQUITY RATIO RULINGS

84. As the Board has recognized, a utility's ROE and capital structure are linked.⁶³ Accordingly, the ROE Ruling and the Equity Ratio Ruling are addressed together in the following section of this Application.

A. Background

i. Yukon Electrical's Last GRA and the BCUC Generic Cost of Capital Model

85. In its decisions regarding Yukon Electrical's 2008-2009 Phase 1 GRA and YEC's 2008-2009 GRA issued February 12, 2009 and September 8, 2009, respectively, the Board adopted a formula-based approach to determining ROE issues.⁶⁴ Specifically, the Board adopted the British Columbia Utilities Commission ("BCUC") generic cost of capital ("GCC") model since it was "the most appropriate as it has been the most recently reviewed, and is generally accepted by the parties".⁶⁵ The Board further ruled that the BCUC GCC model "is a precedent for this jurisdiction and will continue to be the precedent for this jurisdiction until otherwise ordered by this Board."⁶⁶ The Board also ruled that "when using the BCUC generic cost of capital, a risk premium is required for Yukon utilities."⁶⁷
86. Under the BCUC GCC model adopted by the Board, the ROE and capital structure are set for a benchmark utility. Other utilities' respective ROEs are then adjusted upwards or downwards, using a ROE risk premium "adder" or "subtractor," depending on how each utility's business risk compares to the benchmark utility, while capital structure generally remains constant. By adopting the BCUC model, the Board rejected the AUC GCC approach of setting a generic ROE for all utilities, and then adjusting for higher (or lower) than average business risk by increasing (or decreasing) each utility's common equity ratio.⁶⁸
87. In Board Order 2014-06 regarding Yukon Electrical's 2013-2015 Phase 1 GRA, the Board states that:

...at the time of Board Order 2009-02, the BCUC benchmark utility was FortisBC. For the most recent BCUC decision, the benchmark utility is Fortis Energy.⁶⁹

In fact, there was no change in the BCUC benchmark utility between the time of Board Order 2009-2 and the most recent BCUC decision. Terasen Gas Inc. ("TGI", now known as FortisBC Energy Inc. or "FEI"), a gas utility, was the BCUC benchmark utility at the time of Board Order 2009-2. FEI continues to be the BCUC

⁶³ See e.g. Appendix A to Board Order 2009-2, page 27

⁶⁴ Appendix A to Board Order 2009-2, page 29; Appendix A to Board Order 2009-8, paragraph 280

⁶⁵ Appendix A to Board Order 2009-2, page 29; Appendix A to Board Order 2009-8, paragraph 281

⁶⁶ Appendix A to Board Order 2009-8, paragraph 252 [Emphasis added]

⁶⁷ Appendix A to Board Order 2009-2, page 29; Appendix A to Board Order 2009-8, paragraph 282 [Emphasis added]

⁶⁸ Appendix A to Board Order 2013-01, paragraph 224

⁶⁹ Appendix A to Board Order 2014-06, page 50

benchmark utility in the most recent BCUC generic cost of capital decision. To summarize:

Table 4 – Summary of British Columbia Utilities

	BCUC Benchmark Utility	B.C. Electrical Utility
Company name at the time of Board Order 2009-2	Terasen Gas Inc. ("TGI") (gas utility)	FortisBC Inc. ("FBC")
Company name at the time of the 2013 BCUC generic cost of capital decision (Order G-75-13) – May 2013	FortisBC Energy Inc. ("FEI") (gas utility) (name changed from Terasen Gas Inc. effective March 1, 2011)	FortisBC Inc. ("FBC")

88. Table 5 shows the approved 2008-2009 ROEs and common equity ratios approved by the BCUC/Board for the BCUC benchmark utility, FBC (BC electrical utility), Yukon Electrical and YEC:

Table 5 – 2008/2009 Allowed ROEs and Common Equity Ratios

Metric \ Utility	BCUC Benchmark	FBC	Yukon Electrical	YEC⁷⁰
2008 Allowed ROE	8.62% ⁷¹	9.02% ⁷²	9.08%	9.14%
2009 Allowed ROE	8.47% ⁷³	8.87% ⁷⁴	8.93%	8.99%
2008-2009 Allowed Common Equity Ratio	35.01% ⁷⁵	40.00% ⁷⁶	40.00% ⁷⁷	40.00% ⁷⁸

⁷⁰ YEC's final approved ROE for each year is reduced by 50 basis points in accordance with OIC 1990/95.

⁷¹ BCUC Letter No. L-93-07

⁷² 40 basis point risk premium over the benchmark approved in BCUC Order G-52-05; FBC allowed ROE for 2008 confirmed in BCUC Generic Cost of Capital (GCOC) Proceeding – Stage 2, FortisBC Inc. Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1 (Exhibit B 1-73), page 76

⁷³ BCUC Letter No. L-55-08

⁷⁴ 40 basis point risk premium over the benchmark approved in BCUC Order G-52-05; FBC allowed ROE for 2009 confirmed in BCUC Generic Cost of Capital (GCOC) Proceeding – Stage 2, FortisBC Inc. Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1 (Exhibit B 1-73), page 76

⁷⁵ BCUC Order G-14-06

⁷⁶ BCUC Order G-52-05

⁷⁷ Board Order 2009-2

⁷⁸ Board Order 2009-8

89. Table 6 shows the differences in the allowed 2008-2009 ROEs and common equity ratios from the BCUC benchmark utility :

Table 6 – 2008/2009 Allowed ROEs and Common Equity Ratios As Compared to the BCUC Benchmark Utility

Metric \ Utility	FBC	Yukon Electrical	YEC
2008 Allowed ROE Premium	+0.40%	+0.46%	+0.52%
2009 Allowed ROE Premium	+0.40%	+0.46%	+0.52%
2008-2009 Allowed Common Equity Ratio Premium	+5.00%	+5.00%	+5.00

90. Notably, in Yukon Electrical's 2008-2009 GRA, the Board awarded Yukon Electrical a risk premium of 46 basis points above the BCUC benchmark ROE, based on the midpoint between the risk premiums awarded to YEC (52 basis points) and FBC (40 basis points), and a capital structure with a 5% higher common equity ratio as compared to the BCUC benchmark.
91. In December 2009, shortly after the issuance of Board Orders 2009-2 and 2009-08, the BCUC increased its benchmark ROE to 9.5% (effective July 1, 2009) and its benchmark equity ratio to 40% (effective January 1, 2010).⁷⁹
92. Two further aspects of Yukon Electrical's penultimate GRA should also be noted:
- (a) In setting an equity ratio of 40% for Yukon Electrical in Board Order 2009-2, this Board also held that this equity ratio would be similar to the equity ratio of 39.57% for Northland Utilities (Yellowknife) Limited approved by the Northwest Territories Public Utilities Board in Decision 12-2005;⁸⁰ and
 - (b) the Board rejected the use of the stand-alone principle in determining capital structure.

ii. The 2013-01 YEC Rulings

93. In March 2013, the Board issued Order 2013-01 regarding YEC's 2012-2013 GRA. In that decision, the Board set YEC's approved ROE at 8.25% for 2012 and 2013 on 40% common equity ratio (collectively, the "**2013 YEC Rulings**").⁸¹ The 2013 YEC Rulings must be put in their appropriate context, however. To do that, it is important to understand the approach of YEC in its 2012-2013 GRA.
94. In terms of ROE, YEC had sought to maintain its previously-approved 52 basis point risk premium on top of the BCUC benchmark ROE, as was approved by the

⁷⁹ BCUC Order G-158-09

⁸⁰ YUB-YECL-31; YUB-YECL-33(b) at pp. 2-4 and Attachment 1 at pp. 22-25

⁸¹ Appendix A to Board Order 2013-01, paragraphs 230 and 202

Board in YEC's 2008-2009 GRA. Since the BCUC benchmark had not been reviewed since 2009, YEC used the more recent 8.75% benchmark ROE approved by the AUC in 2011. YEC then added its previously-approved 52-basis point risk premium, then subtracted 50 basis points pursuant to OIC 1995/90, resulting in an applied-for ROE of 8.77%. Certain interveners argued that YEC's proposal to apply a risk premium to the benchmark Alberta return was inappropriate because the risk premium was used in the BCUC GCC model, whereas the Alberta GCC model provided compensation for additional risk via a higher common equity ratio. While the Board accepted YEC's use of the Alberta benchmark ROE (because it was more current), the Board declined YEC's proposed risk premium because the Board found that the "risk premium from one model [i.e. the BCUC model] cannot be automatically transferred to the other model [i.e. the Alberta model]".

95. In terms of capital structure, YEC had applied for a 40% common equity ratio — the same capital structure since 1992 (and the Board had approved that capital structure as recently as 2009).⁸² In maintaining YEC's capital structure, the Board specifically noted YEC's submission that there was "no reasonable or tested evidence upon which the Board could support a revision of YEC's capital structure".⁸³ Indeed, neither YEC nor any intervenor in YEC's 2012-2013 GRA proceeding provided any evidence to support a change to YEC's capital structure.
96. In sum, the 2013-01 YEC Rulings resulted from the following factors:
 - (a) YEC only sought to maintain its previously approved ROE risk premium (without any evidence in support of that risk premium);
 - (b) YEC proposed to have that risk premium applied on top of the Alberta benchmark ROE, rather than the BCUC benchmark ROE, but failed to account for the differences in the Alberta and BCUC GCC models; and
 - (c) YEC chose to maintain its capital structure and no evidence was filed in support of a change to its capital structure.

iii. 2013 BCUC Generic Cost of Capital Proceeding

97. On May 10, 2013, the BCUC issued Order G-75-13⁸⁴ in which the BCUC set the ROE for the benchmark utility⁸⁵, FEI (a gas utility), to 8.75% and the benchmark common equity ratio for FEI at 38.5% (both effective January 1, 2013).⁸⁶ In

⁸² Appendix A to Board Order 2013-01, s. 3.5.2

⁸³ Appendix A to Board Order 2013-01, paragraph 201

⁸⁴ YEC-YECL-13(a) Attachment 1, BCUC Order G-75-13

⁸⁵ Previously, the BCUC referred to a "low-risk benchmark utility". However, in Order G-75-13, the BCUC determined that terminology was inappropriate: YEC-YECL-13(a) Attachment 1, BCUC Order G-75-13, page 123

⁸⁶ The BCUC also adopted an automatic adjustment mechanism ("AAM") formula for annually setting the ROE of the benchmark between BCUC GCC proceedings, commencing January 1, 2014. The AAM adopted by the BCUC would become operative if long term Canada bond yields were to meet or exceed 3.8%: GRA, page 8-6.

establishing an updated benchmark ROE and capital structure, the BCUC reviewed the long- and short-term risk of the benchmark utility, FEI. The BCUC noted eight primary factors that influenced FEI's long-term risk, and found in respect of each of those factors either no evidence that the risk associated with any of those factors had increased, or that the risk had decreased.⁸⁷ The BCUC also found that there had not been a material change to FEI's short-term risk.⁸⁸ Nevertheless, the benchmark ROE and common equity ratio established by the BCUC in 2013 (i.e. at the time of Yukon Electrical's 2013-2015 GRA) were both higher than those in effect when Board Order 2009-2 was issued, as outlined in Table 7:

Table 7 – Allowed ROEs and Common Equity Ratios for the BCUC Benchmark Utility

Utility	ROE			Common Equity Ratio		
	As of Yukon Electrical's 2008-2009 GRA	As of YEC's 2012-2013 GRA	As of Yukon Electrical's 2013-2015 GRA	As of Yukon Electrical's 2008-2009 GRA	As of YEC's 2012-2013 GRA	As of Yukon Electrical's 2013-2015 GRA
FEI	8.47%	9.50%	8.75%	35%	40%	38.5%

98. No determination of FBC's approved ROE and common equity ratio premiums were made in Order G-75-13 regarding Stage 1 of the BCUC 2013 General Cost of Capital proceeding. The approved ROE and common equity ratio premiums for the non-benchmark utilities were subject to a separate proceeding, the results of which were not known until March 25, 2014.

iv. Yukon Electrical's GRA

99. In its 2013-2015 GRA filed May 27, 2013, Yukon Electrical:
- (a) applied to maintain its previously approved 46 basis point ROE risk premium during the test period;
 - (b) proposed to have that risk premium applied on top of the most recently approved BCUC benchmark ROE (8.75%, meaning Yukon Electrical's total requested ROE was 9.21%, subject to adjustment),⁸⁹ and
 - (c) applied for a 4% increase in its common equity ratio during the test period (from 40 to 44%).⁹⁰

⁸⁷ YEC-YECL-13(a) Attachment 1, BCUC Order G-75-13, s. 4.2

⁸⁸ YEC-YECL-13(a) Attachment 1, BCUC Order G-75-13, page 42

⁸⁹ Yukon Electrical also proposed to have any adjustments to the BCUC benchmark ROE pursuant to the AAM incorporated into its ROE via a proposed ROE deferral account: GRA, page 8-5

⁹⁰ GRA, page 8-6

100. Yukon Electrical filed significant evidence in the GRA proceeding in support of requested ROE and capital structure. For instance:
- (a) Yukon Electrical explained its business risks (including through uncontroverted expert evidence on its business risks), and explained how its business risk had increased modestly since its 2008-2009 GRA due to changes in its market demand, operational costs and generation assets;⁹¹
 - (b) Yukon Electrical noted the higher ROEs and capital structures recently approved for utilities in BC and the Northwest Territories — including the 9.10% ROE and 43.5% common equity ratio approved by the Northwest Territories Public Utilities Board for Northland Utilities (Yellowknife) Ltd., which faces similar business risk to Yukon Electrical;⁹²
 - (c) Yukon Electrical provided a table comparing it to other utilities in BC and the Northwest Territories, including FEI (the BCUC benchmark utility, a gas utility), FBC (electrical utility that was used by the Board as part of the justification for the 40 basis point premium awarded to Yukon Electrical in Board Order 2009-2) and Northland Utilities (Yellowknife) Ltd.;⁹³
 - (d) Yukon Electrical noted that the increasing amount of generation assets in its rate base increased its business risk (as compared with the risks it faced at the time of its 2008-2009 GRA),⁹⁴ and
 - (e) Yukon Electrical explained that under the stand-alone principle, its cost of capital should be equivalent to that which would be faced if it was raising capital in the public markets on the strength of its own business and financial parameters;⁹⁵ and
 - (f) Yukon Electrical calculated its financial credit metrics (FFO/Debt and FFO Interest Coverage) and noted that its metrics continued to fall within the acceptable range (as suggested by its expert).⁹⁶
101. No conflicting evidence was filed by interveners in the GRA. Yukon Electrical specifically noted and relied upon most of the foregoing evidence in its argument in supporting its requested ROE and capital structure. Yukon Electrical also argued that the Board should revisit its previous rejection of the stand-alone principle in Board Order 2009-2, and the Yukon Electrical "should not be penalized simply because YEC, for whatever reason, chose not to apply for an increase to its historical capital structure that has been in place since the early 1990s".

⁹¹ GRA, pages 8-4 and 8-5; YUB-YECL-33(b) Attachment 1; YUB-YEC-31; YUB-YECL-33(a); LE-YECL-11(a)

⁹² GRA, page 8-4; UCG-YECL-30(a); WL-YECL-17(a); UCG-YECL-30(g)

⁹³ YUB-YECL-33(b), page 4 of 5

⁹⁴ LE-YECL-11(a)

⁹⁵ UCG-YECL-30(e)

⁹⁶ WL-YECL-17(b) Attachment 1; UCG-YECL-30(g)

102. Table 8 shows the approved 2013 ROEs and common equity ratios approved by the Board/BCUC for the BCUC benchmark utility, FBC (BC electrical utility), Yukon Electrical and YEC:

Table 8 – 2013 Allowed ROEs and Common Equity Ratios

Metric \ Utility	BCUC Benchmark	FBC	Yukon Electrical	YEC
2013 Allowed ROE	8.75%	40 basis point premium over BCUC benchmark (9.15%) ⁹⁷	No premium over BCUC benchmark (8.75%)	No longer tied to BCUC benchmark (Board Order 2013-01)
2013 Common Equity Ratio	38.50%	1.50% premium over BCUC benchmark (40.00%) ⁹⁸	1.50% premium over BCUC benchmark (40.00%) (reduced from 5.00% premium awarded in Board Order 2009-2)	No longer tied to BCUC benchmark (Board Order 2013-01)

103. In rendering the ROE Ruling, the Board adopted the Utilities Consumer Group's argument that "no assessment" had "been provided regarding the comparability of Yukon Electrical:

The Board agrees with the submissions of UCG that no assessment has been provided within this proceeding regarding the comparability of YECL to the BCUC benchmark utility Fortis Energy. The previous risk premium was based on FortisBC, which is an electrical distribution company. BCUC Order G-75-13 — the Stage 1 GCOC proceeding decision dated May 10, 2013 — identifies Fortis Energy as a gas distribution utility. Other than it being a distribution and regulated utility, no other comparisons to YECL can be gleaned from the benchmark decision. As a result, the determination of whether a risk premium should be applied is not clear.⁹⁹

104. The Board then found that Yukon Electrical had "not established a prima facie case to quantify a risk premium over the BCUC benchmark utility".¹⁰⁰

⁹⁷ No update to the 40 basis point ROE premium and 40% common equity ratio awarded to FBC for 2008 and 2009 was available at the time of filing of Yukon Electrical's 2013-2015 GRA. Subsequently, on March 25, 2014, the BCUC issued Order G-47-14 which reaffirmed the 40 basis point ROE premium and 40% common equity ratio for FBC effective January 1, 2013. BCUC Order G-47-14 was issued twenty-nine days prior to Board Order 2014-06.

⁹⁸ *Ibid.*

⁹⁹ Appendix A to Board Order 2014-06, s. 8.1.1, page 51

¹⁰⁰ *Ibid.*

105. In rendering the Equity Ratio Ruling, the Board relied upon its prior rejection of the stand-alone principle in Appendix A to Board Order 2009-2. The Board, while recognizing that it had done so previously, noted that it had "not relied upon the results of generic proceedings from other jurisdictions" but instead was "using utilities within Yukon [i.e. YEC and Yukon Electrical] in its decision-making". Citing Yukon Electrical's acknowledgements that YEC faced moderately higher business risk than it, and its business risk was comparable to the risk it faced at the time of its 2008-09 GRA, the Board determined that "it would not make sense to approve an equity ratio for YECL higher than that approved for YEC" and that "the equity thickness presented for the NWT jurisdictions or for the BCUC GCOC benchmark utility is not comparable to YECL."¹⁰¹

B. Grounds for R&V

106. Yukon Electrical respectfully submits that the Board should reconsider the ROE Ruling and the Equity Ratio Ruling because they were premised on errors of fact, law and/or jurisdiction that raise substantial doubts as to the correctness of the rulings. Specifically, in rejecting Yukon Electrical's request for a 46 basis point equity risk premium and a 4% increase in common equity ratio, and in setting Yukon Electrical's allowed ROE at 8.75% with a 40% common equity ratio:
- (a) the Board committed errors of law and jurisdiction by failing to set a fair return on rate base for Yukon Electrical;
 - (b) the Board committed an error of law by applying the wrong test to determine a fair return for Yukon Electrical;
 - (c) the Board committed an error of fact or law by overlooking or disregarding Yukon Electrical's extensive evidence regarding its business risk relative to other utilities (besides YEC);
 - (d) the Board committed an error of law or jurisdiction by failing to apply the stand-alone principle in setting Yukon Electrical's capital structure; and
 - (e) the Board committed an error of law or jurisdiction by unfairly deviating from its recent prior capital structure rulings.
107. Each of those points is explained below in Subsection V.B.i through V.B.v of this Application, respectively. Following that, Yukon Electrical explains why the errors underlying the ROE Ruling have significant material implications in Subsection V.B.vi of this Application.
- i. The Board committed errors of law and jurisdiction by failing to set a fair return on rate base for Yukon Electrical**
108. The Board is legally required to set a fair return on rate base for Yukon Electrical. This obligation is jurisdictional, having been enshrined in subsection 32(2) of the PUA, the Board's constating legislation. Subsection 2(1) of OIC 1995/90 also

¹⁰¹ Appendix A to Board Order 2014-06, s. 8.1.3.1, page 54

requires the Board to "include in the rates of...the Yukon Electrical Company Limited provision to recover a fair return on [its] equity used to finance [its] rate base." As noted above, section 3 of OIC 1995/90 requires the Board to review and approve rates "in accordance with the principles established in Canada for utilities, including those principles established by regulatory authorities of the Government of Canada or of a province regulating hydro and non-hydro electric utilities". The ROE and Equity Ratio Rulings failed to satisfy these because they did not accord with the well established fair return standard.

109. The leading Canadian decision on the fair return standard is the Supreme Court of Canada's decision in *Northwestern Utilities Ltd. v. Edmonton (City)* ("**Northwestern**").¹⁰² In addition to NUL, two decisions of the Supreme Court of the United States complete the "fair return standard trilogy" and are well accepted in Canadian law: *Bluefield Waterworks & Improvement Company v. Public Service Commission of the State of West Virginia et al.* ("**Bluefield**"),¹⁰³ and *Federal Power Commission et al. v. Hope Natural Gas Co.* ("**Hope**").¹⁰⁴
110. In NUL, the Supreme Court of Canada framed the relationship between just and reasonable rates and the fair return standard in relation to the rate-fixing responsibility of the Alberta Public Utilities Board, and noted that the Board was required to consider the rate of return available from other investments:

The duty of the Board was to set fair and reasonable rates; rates which, under the circumstances, would be fair to the consumer on the one hand, and which, on the other hand, would secure to the company a fair return for the capital invested. By a fair return is meant that the company will be allowed as large a return on the capital invested on its enterprise (which will net to the company) as it would receive if it were investing the same amount in other securities possessing an attractiveness, stability and certainty equal to that of the company's enterprise. In fixing this net return the Board should take into consideration the rate of interest which the company is obliged to pay upon its bonds as a result of having to sell them at a time when the rate of interest payable thereon exceeded that payable on bonds issued at the time of the hearing. To properly fix a fair return the Board must necessarily be informed of the rate of return which money would yield in other fields of investment.¹⁰⁵ [Emphasis added]

111. On the same issue, the Supreme Court of the United States stated in *Bluefield*:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding, risks and uncertainties, but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and

¹⁰² *Northwestern Utilities Ltd. v. Edmonton (City)*, [1929] S.C.R. 186, [1929] 2 D.L.R. 4 [**Northwestern**]

¹⁰³ *Bluefield Waterworks & Improvement Company v. Public Service Commission of the State of West Virginia*, 262 U.S. 679 (1923) [**Bluefield**]

¹⁰⁴ *Federal Power Commission et al. v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) [**Hope**]

¹⁰⁵ *Northwestern*, pages 6-7

economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.¹⁰⁶

112. Similarly, in *Hope*, the Supreme Court of the United States observed:

...the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.¹⁰⁷ [Citations omitted; emphasis added]

113. From this trilogy are derived the “comparable investment,” “financial integrity” and “capital attraction” tests.¹⁰⁸ A fair return must meet each of these three tests:

- (a) the *comparability* component of the fair return standard requires that a utility be permitted to earn as large a return for its investors as they would receive if they were investing the same amount in other securities possessing an attractiveness, stability and certainty equity to that of the company's enterprise;¹⁰⁹
- (b) the *financial integrity* component of the fair return standard provides that a utility shall be permitted to earn a return that is sufficient to assure confidence in the financial integrity of the enterprise;¹¹⁰ and
- (c) the *capital attraction* component of the fair return standard provides that a utility shall be permitted to earn a return sufficient so as to maintain its credit and to attract capital.¹¹¹

114. In Yukon Electrical's submission, the ROE and Capital Structure Rulings failed to satisfy the comparability test. The essence of that test is that it requires a regulator to consider returns available from other comparable investments in setting the awarded return and capital structure for a utility. That, in turn, requires consideration for the returns awarded to utilities in other jurisdictions. As noted

¹⁰⁶ *Bluefield*, pages 692-693

¹⁰⁷ *Hope*, page 603

¹⁰⁸ See e.g. Alberta Energy & Utilities Board Decision 2004-052, Generic Cost of Capital (July 2, 2014), where the Alberta Energy & Utilities Board cited with approval the comparable investment, financial integrity and capital attraction tests; see also Major and Priddle for an extensive discussion of the fair return standard and its widespread acceptance with Canadian regulators.

¹⁰⁹ In *Northwestern*, at page 8, the Supreme Court of Canada unequivocally stated that a utility will be allowed “...as large a return on the capital invested in its enterprise...as it would receive if it were investing the same amount in other securities possessing an attractiveness, stability and certainty equal to that of the company's enterprise...”

¹¹⁰ In *Northwestern*, at page 8, the Court referred to “stability and certainty”. The Supreme Court of the United States stated in *Bluefield*, at page 693, that “[t]he return should be reasonably sufficient to assure confidence in the financial soundness of the utility...” and stated in *Hope*, at page 608, “[t]hat return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise...”

¹¹¹ The Supreme Court of the United States stated in *Bluefield*, at page 693, that “[t]he return...should be adequate...to enable it [the utility] to raise the money necessary for the proper discharge of its public duties”. In *Hope*, at page 608, the Court stated: “[t]hat return, moreover, should be sufficient...so as to maintain its credit and to attract capital”.

above, the Board acknowledged in the Board Order that "it had not relied upon the results of generic proceedings from other jurisdictions" and instead confined its consideration of the equity ratio awarded to YEC, while the Board also failed to set Yukon Electrical's ROE at a level that reflected Yukon Electrical's risk relative to utilities in other jurisdictions. The ROE and capital structure awarded to Yukon Electrical in the Board Order, according to the uncontroverted evidence before the Board, was the same as utilities in BC with lower business risk, and was lower than utilities in the NWT with comparable business risk.

ii. The Board committed an error of law by applying the wrong test to determine a fair return for Yukon Electrical

115. In Yukon Electrical's submission, the Board's determination that Yukon Electrical had "not established a prima facie case to quantify a risk premium over the BCUC benchmark utility"¹¹² shows that the Board committed an error of law by applying the wrong test in establishing Yukon Electrical's fair return. There is no legislation, nor any regulation, that requires Yukon Electrical to "establish a prima facie case to quantify a risk premium" over the BCUC benchmark utility. Yukon Electrical is not aware of any prior Board decision that has imposed such a requirement.
116. Additionally, the Board appears to have determined that the capital structure and risk premium awarded to YEC should be the overriding factor in setting Yukon Electrical's cost of capital, without regard for the particular considerations that drive the cost of capital sought by YEC, a government-owned utility.
117. In Yukon Electrical's respectful submission, neither approach is correct. Rather, the Board was required to consider the fair return standard in determining a fair return for Yukon Electrical. This required the Board to have regard for cost of capital determinations in respect of utilities other than just YEC. The Board Order provides no indication that the Board did so.

iii. The Board committed an error of fact or law by overlooking Yukon Electrical's extensive evidence regarding its business risk relative to other utilities (besides YEC)

118. As noted above in Section IV.B.iii of this Application, it is an error of law for an administrative decision maker to:
 - (a) overlook or misapprehend relevant and conclusive evidence;
 - (b) not base its decision on the facts before it; or
 - (c) make a finding of fact that is contrary to the evidence before it.
119. In Yukon Electrical's submission, it is clear on the face of the Board Order that the Board overlooked or disregarded much of the significant evidence filed by

¹¹² Appendix A to Board Order 2014-06, s. 8.1.1, page 51

Yukon Electrical in the GRA proceeding in support of its requested ROE and capital structure. In particular:

- (a) in determining that Yukon Electrical had "not established a prima facie case to quantify a risk premium over the BCUC benchmark utility", the Board appears to have overlooked or misapprehended the specific and uncontroverted evidence provided by Yukon Electrical comparing it with Fortis Energy Inc. (among other utilities), and made a finding of fact that was contrary to that evidence;¹¹³ and
- (b) the Board, in reducing Yukon Electrical's awarded ROE relative to utilities in other jurisdictions while maintaining Yukon Electrical's capital structure, overlooked or misapprehended the uncontroverted evidence provided by Yukon Electrical regarding its increased business risk.¹¹⁴

iv. The Board committed an error of fact or law by failing to apply the stand-alone principle in setting Yukon Electrical's capital structure

- 120. The stand-alone principle is a well accepted principle that has been applied by federal and provincial regulatory agencies across Canada.¹¹⁵ The National Energy Board and the Alberta utilities regulator have both referred to it as "a fundamental concept of utility regulation",¹¹⁶ while the BCUC recently reaffirmed the "long history and importance of the stand-alone principle in Canadian utility regulation."¹¹⁷
- 121. As noted above, section 3 of OIC 1995/90 requires the Board to set Yukon Electrical's rates in accordance with the principles established in Canada for utilities, including by regulatory authorities of the Government of Canada and by provinces regulating hydro and non-hydro electric utilities. The stand-alone principle is unequivocally one such principle. Therefore, because the Board relied upon its prior rejection of the stand-alone principle in Appendix A to Board

¹¹³ YUB-YECL-33(b), page 4 of 5

¹¹⁴ GRA, pages 8-4 and 8-5; YUB-YECL-33(b) Attachment 1; YUB-YEC-31; YUB-YECL-33(a); LE-YECL-11(a)

¹¹⁵ See e.g. National Energy Board Reasons for Decision RH-R-1-2002, Review of RH-4-2001, Cost of Capital Decision, TransCanada PipeLines Limited (February 2003) [NEB RH-R-1-2002], pages 25-26; Alberta Energy and Utilities Board Decision 2001-92, GENCO and DISCO 2000 Pool Price Deferral Accounts Proceeding, Part K: Recovery Period, Carrying Cost Rates, Collection Issues, and Hedging Issues (December 12, 2001); BCUC Order G-75-13, page 100; Manitoba Public Utilities Board Order # 135/05 Centra Gas Manitoba Inc., An Order Arising Out of Orders 103/05 and 115/05 (October 12, 2005); Ontario Energy Board Order RP-2002-0158, Applications by Union Gas Limited and Enbridge Gas Distribution Inc. for a Review of the Board's Guidelines for Establishing their Respective Return on Equity (January 16, 2004); Régie de L'Énergie Decision D-2014-034 (March 4, 2014),
online: <http://www.canlii.org/fr/qc/qcrde/doc/2014/2014canlii9733/2014canlii9733.html>

¹¹⁶ NEB RH-R-1-2002, page 25; EUB Decision 2001-92, page 24;

¹¹⁷ YEC-YECL-13(a) Attachment 1, BCUC Order G-75-13, page 100

Order 2009-2 in rendering the Equity Ratio Ruling, the Board failed to comply with its legal and jurisdictional obligation under section 3 of OIC 1995/90.¹¹⁸

v. The Board committed an error of law or jurisdiction by unfairly deviating from its recent prior capital structure rulings

122. It is readily apparent that in preparing the GRA and participating in the GRA proceeding, Yukon Electrical had regard for and relied upon the Board's rulings that the BCUC GCC model "is a precedent for this jurisdiction and will continue to be the precedent for this jurisdiction until otherwise ordered by this Board"¹¹⁹ and that "when using the BCUC generic cost of capital, a risk premium is required for Yukon utilities".¹²⁰ The Board abandoned those rulings in Board Order 2014-06, however, and did so without any specific prior notice to Yukon Electrical that those prior rulings were subject to review in the GRA proceeding. In addition, no explanation or rationale was provided as to why the previously approved approach was not applicable. In this regard, Yukon Electrical notes that FBC continues to have a 40 basis point ROE premium over the BCUC benchmark (see p. 27 hereof); and the YUB used this FBC premium in determining Yukon Electrical's ROE premium in Decision 2009-2. No evidence was provided by any party in the current GRA that would justify a reduction in this previously approved ROE premium.
123. In Yukon Electrical's respectful submission, when the Board issues a specific ruling about something constituting a precedent for the Yukon, the Board should reasonably expect that parties such as Yukon Electrical will rely on that ruling in preparing filings and their case before the Board. If the Board intends to abandon previously accepted approaches or processes, to prevent procedural unfairness to parties, the Board should provide specific prior notice to parties so that they can prepare their case accordingly and there should be some evidence to support such a dramatic change. The Board did not provide such notice in the GRA proceeding and no evidence exists to support the change in position. The failure to do so resulted in a procedurally unfair process, with Yukon Electrical being deprived of its right to natural justice, including the right to know the case it had to meet.¹²¹

vi. The ROE Ruling and Equity Ratio Ruling errors have significant material implications

124. The errors in the ROE Ruling and the Equity Ratio Ruling deny Yukon Electrical a fair return. Yukon Electrical estimates the annual financial impact of those

¹¹⁸ While Yukon Electrical did not appeal or apply to review and vary the Board's determination with respect to the application of the stand-alone principle in Appendix A to Order 2009-2, Yukon Electrical submits that the failure of a party to object to a prior error of law does not foreclose their ability to do so in the future, and cannot absolve the Board from its statutory and jurisdictional obligations.

¹¹⁹ Appendix A to Board Order 2009-8, paragraph 252

¹²⁰ Appendix A to Board Order 2009-2, page 29; Appendix A to Board Order 2009-8, paragraph 282

¹²¹ See e.g. *Flamborough (Town) v. Canada (National Energy Board)*, [1987] FCJ No. 460

errors to be approximately \$1,545,000¹²² for the test period. This alone demonstrates that the ROE Ruling and the Equity Ratio Ruling errors have significant material implications for Yukon Electrical.

125. Additionally, Yukon Electrical and its shareholder rely on a utility's right to earn a fair return in making investment decisions. Any contrary regulatory precedent has significant material implications for Yukon Electrical and its shareholder.

VI. COMMUNICATIONS

126. Communications related to this proceeding should be directed to Yukon Electrical and its legal counsel as follows:

- (i) The Yukon Electrical Company Limited
100, 1100 Front Street
Whitehorse, YT Y1A 3T4
Attention: Mr. Dwight Redden, P. Eng.
General Manager
Phone: (867) 633-7003
dwight.redden@atco.com
- (ii) ATCO Electric Ltd.
10035 Jasper Avenue
Edmonton, AB T5J 2V6
Attention: Mr. James Grattan
Director, Regulatory
Phone: (780) 733-2489
james.grattan@atcoelectric.com
- (iii) Bennett Jones LLP
4500 Bankers Hall East
855 – 2nd Street SW
Calgary, AB T2P 4K7
Attention: Mr. Loyola Keough
Partner
Phone: (403) 298-3429 Fax: (403) 265-7219
keoughl@bennettjones.com

VII. RELIEF REQUESTED

127. For the foregoing reasons, Yukon Electrical respectfully requests that the Board, pursuant to section 62 of the PUA and rule 31 of the Board Rules, should convene a phase II review on the merits of the GRA Rulings or proceed directly to:

(a) vacate the Bi-Fuel Ruling (as discussed above in Section III);

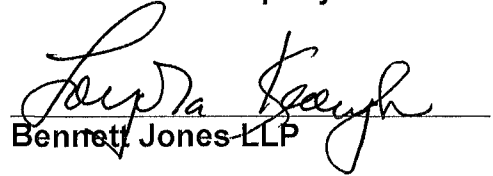
¹²² Impact of ROE Ruling: \$190,000 for 2013, \$223,000 for 2014, \$245,000 for 2015; Impact of Equity Ratio Ruling: \$258,000 for 2013, \$314,000 for 2014, \$315,000 for 2015 (Compliance Filing, Attachments 1-3)

- (b) vacate the COLA Ruling (as discussed above in Section IV); and
- (c) vary the ROE Ruling and Equity Ratio Rulings (as discussed above in Section V) to grant the relief requested in the GRA.

ALL OF WHICH is respectfully submitted this 27th day of October, 2014

The Yukon Electrical Company Limited

Per:


Bennett Jones LLP

Project: Watson Lake Bi-Fuel Project

Cost Comparison

Reference	Lease of Equipment from ATCO Gas	Purchase of Equipment from ATCO Gas
Base Year	2015	2015
In-Service Year	2015	2015

Revenue Requirement	Lease of Equipment from ATCO Gas	Purchase of Equipment from ATCO Gas
(from base year)		
CPV @ Year 5	\$996,181	\$1,096,312
CPV @ Year 10	\$1,859,113	\$1,826,424
CPV @ Year 15	-	-
CPV @ Year 20	-	-
CPV @ Year 25	-	-
CPV @ Year 40	-	-

Capital Cost Summary

(2015 Dollars)	Lease of Equipment from ATCO Gas	Purchase of Equipment from ATCO Gas
Generation	\$0	\$2,025,100
Distribution	\$0	\$0
Communication	\$0	\$0
Other	\$0	\$0
Total	\$0	\$2,025,100

(Includes ES&G, escalation, & AFUDC)

Generation	\$0	\$2,025,100
Distribution	\$0	\$0
Communication	\$0	\$0
Other	\$0	\$0
Total	\$0	\$2,025,100

Cost Comparison

Year	Lease of Equipment from ATCO Gas	Purchase of Equipment from ATCO Gas	
2015	\$88,000	\$145,515	
2016	\$336,313	\$422,798	-\$86,484
2017	\$569,872	\$671,922	-\$102,050
2018	\$789,554	\$895,606	-\$106,053
2019	\$996,181	\$1,096,312	-\$100,131
2020	\$1,190,532	\$1,276,275	-\$85,743
2021	\$1,373,334	\$1,437,518	-\$64,184
2022	\$1,545,274	\$1,581,876	-\$36,601
2023	\$1,706,998	\$1,711,009	-\$4,011
2024	\$1,859,113	\$1,826,424	\$32,689
2025	\$1,954,497	\$1,922,074	\$32,423

ATCO Electric Yukon Project Economic Evaluation

Input data in blue

Lease of Equipment from ATCO Gas

Cost Impact

Assumptions:

1 Financial Parameters

Distribution Capital Structure and Cost

	Return	Ratio	B.T. Cost	A.T. Cost
Debt	5.74%	60.00%	3.44%	3.44%
Preferred	0.00%	0.00%	0.00%	0.00%
Common	8.75%	40.00%	5.00%	3.50%
TOTALS		100.00%	8.44%	6.94%

Generation Capital Structure and Cost

	Return	Ratio	B.T. Cost	A.T. Cost
Debt	5.74%	60.00%	3.44%	3.44%
Preferred	0.00%	0.00%	0.00%	0.00%
Common	8.75%	40.00%	5.00%	3.50%
TOTALS		100.00%	8.44%	6.94%

Incremental Depreciation Rates:

	Service Life	Rate
Generation	20	5.00%
Distribution	20	5.00%

Income Taxes and Escalation

	2011	2012	2013	2014	>=2015
Federal and Territorial Income Tax	31.50%	30.00%	30.00%	30.00%	30.00%
Escalation					
Capital		2.00%	2.00%	2.00%	2.00%
O & M		2.00%	2.00%	2.00%	2.00%

2015 Income Taxes	30.00%

2 All analysis are based on 11 years of costs.

3 Embedded distribution capital and O&M costs are not considered in analysis.

4 Base Year (\$)	2015
In-Service Year	2015

5 Incremental Capital Spending:

	Annual Escalation Factor	1.000	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
	Compounded Escalation Factor	1.000	1.020	1.040	1.061	1.082	1.104	1.126	1.149	1.172	1.195	1.219	1.243	1.268	1.294	1.319	1.346
	ISD Index	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2030
Enter capital expenditures in 2015 dollars (include ES&C and Contingency)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 16
Generation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital Cost (2015\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital Cost (Nom\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Source:

7 Incremental Operation and Maintenance Costs:

Annual Escalation Factor	1.000	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Compounded Escalation Factor	1.000	1.020	1.040	1.061	1.082	1.104	1.126	1.149	1.172	1.195	1.219	1.243	1.268	1.294	1.319	1.346
ISD Index	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

O&M Calculated based on Percentage of Rate Base (Nom\$)

No

 (yes or no) Manually enter O&M in next section

If non-linear O&M is required, manually input the data into the Manual Input table.
O & M based on a percentage of capital cost at ISD, escalated thereafter.

O&M Rates	2015 Year 1	2016 Year 2	2017 Year 3	2018 Year 4	2019 Year 5	2020 Year 6	2021 Year 7	2022 Year 8	2023 Year 9	2024 Year 10	2025 Year 11	2026 Year 12	2027 Year 13	2028 Year 14	2029 Year 15	2030 Year 16
Generation Rate =	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Rate =	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications Rate =	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications Rate =	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other Rate =	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

O&M Manual Input (2015\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation O&M	\$88,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$176,000	\$0	\$0	\$0	\$0	\$0
Distribution O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	\$88,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$264,000	\$176,000	\$0	\$0	\$0	\$0	\$0

Escalated Manually Input O&M (Nom\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation O&M	\$88,000	\$269,280	\$274,666	\$280,159	\$285,762	\$291,477	\$297,307	\$303,253	\$309,318	\$315,504	\$214,543	\$0	\$0	\$0	\$0	\$0
Distribution O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	\$88,000	\$269,280	\$274,666	\$280,159	\$285,762	\$291,477	\$297,307	\$303,253	\$309,318	\$315,504	\$214,543	\$0	\$0	\$0	\$0	\$0

ATCO Electric Yukon Project Economic Evaluation

Input data in blue

Purchase of Equipment from ATCO Gas

Cost Impact

Assumptions:

1 Financial Parameters

Distribution Capital Structure and Cost

	Return	Ratio	B.T. Cost	A.T. Cost
Debt	5.74%	60.00%	3.44%	3.44%
Preferred	0.00%	0.00%	0.00%	0.00%
Common	8.75%	40.00%	5.00%	3.50%
TOTALS			8.44%	6.94%

Generation Capital Structure and Cost

	Return	Ratio	B.T. Cost	A.T. Cost
Debt	5.74%	60.00%	3.44%	3.44%
Preferred	0.00%	0.00%	0.00%	0.00%
Common	8.75%	40.00%	5.00%	3.50%
TOTALS			8.44%	6.94%

Incremental Depreciation R

Service Life	Rate
Generation	205.00%
Distribution	205.00%

Income Taxes and Escalation

	2011	2012	2013	2014	>=2015
Federal and Provincial Income Tax	31.50%	30.00%	30.00%	30.00%	30.00%
Escalation					
Capital		2.00%	2.00%	2.00%	2.00%
O & M		2.00%	2.00%	2.00%	2.00%

2015 Income Taxes	30.00%

2 All analysis are based on 11 years of costs.

3 Embedded distribution capital and O&M costs are not considered in analysis.

4 Base Year (\$)2015
In-Service Date2015
WARNING: Capital expenditures are occurring in/after ISD year

5 Incremental Capital Spending:

	Annual Escalation Factor	1.000	1.000	1.000	1.000	1.000	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
	Compounded Escalation Factor	1.000	1.000	1.000	1.000	1.000	1.020	1.040	1.061	1.082	1.104	1.126	1.149	1.172	1.195	1.219
	ISD Index	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Enter capital expenditures in 2015 dollars (include ES&G and Contingency)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation	\$2,025,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$2,025,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
(inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital Cost (2015\$)	\$2,025,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital Cost (Nom\$)	\$2,025,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Source:

7 Incremental Operation and Maintenance Costs:

Annual Escalation Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.020	1.020	1.020	1.020	1.020
Compounded Escalation Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.020	1.040	1.061	1.082	1.104
ISD Index	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

O&M Calculated based on Percentage of Rate Base (Nom\$)

No

(yes or no)

Manually enter O&M in next section

If non-linear O&M is required, manually input the data into the Manual Input table.
O & M based on a percentage of capital cost at ISD, escalated thereafter.

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
O&M Rates		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation Rate =	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Rate =	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications Rate =	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications Rate =	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other Rate =	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

O&M Manual Input (2015\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation O&M	\$13,667	\$41,273	\$42,099	\$42,941	\$43,800	\$44,676	\$45,569	\$46,480	\$47,410	\$48,358	\$32,666	\$0	\$0	\$0	\$0	\$0
Distribution O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	\$13,667	\$41,273	\$42,099	\$42,941	\$43,800	\$44,676	\$45,569	\$46,480	\$47,410	\$48,358	\$32,666	\$0	\$0	\$0	\$0	\$0

Escalated Manually Input O&M (Nom\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Generation O&M	\$13,667	\$41,273	\$42,099	\$42,941	\$43,800	\$44,676	\$45,569	\$46,480	\$47,410	\$48,358	\$32,666	\$0	\$0	\$0	\$0	\$0
Distribution O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transmission Communications O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution Other O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	\$13,667	\$41,273	\$42,099	\$42,941	\$43,800	\$44,676	\$45,569	\$46,480	\$47,410	\$48,358	\$32,666	\$0	\$0	\$0	\$0	\$0

Ratepayer Impacts from Watson Lake Bi-Fuel Project (\$million)

		2015	2016	2017	2018	2019	Total Cost (Savings)
Capital Cost (\$million) at yr end							
Total	LNG	2.85	-	-	-	-	
Net	LNG	2.78	2.64	2.49	2.35	2.21	
Annual Capital Cost (\$million)							
Deprec	LNG	0.07	0.14	0.14	0.14	0.14	
Return	LNG	0.12	0.23	0.22	0.21	0.19	
O&M	LNG	0.01	0.04	0.04	0.04	0.04	
Total	LNG	0.20	0.41	0.40	0.39	0.38	
Annual Fuel Cost (\$million)							
Forecast Generation (GWh)		15.3	15.3	15.3	15.3	15.3	
% Diesel Displaced by LNG		7%	32%	50%	50%	50%	
Fuel Cost							
	LNG	0.18	0.80	1.25	1.25	1.25	
	Diesel	0.33	1.51	2.35	2.35	2.35	
Difference		(0.15)	(0.70)	(1.10)	(1.10)	(1.10)	
Net Ratepayer Impact (\$million)							
	LNG + Diesel	0.38	1.22	1.66	1.65	1.63	
	Diesel	0.33	1.51	2.35	2.35	2.35	
Cost (Savings)		0.05	(0.29)	(0.70)	(0.71)	(0.72)	(2.36)

Notes:

1. Presentation and fuel cost assumptions are consistent with those presented by YEC and accepted by the Board in the YEC LNG Project proceeding (Exhibit B-13, YEC LNG Part 3 Update Filing Appendices, March 27, 2014, Table 1)
2. All capital costs depreciated over 20 years; return on mid-year rate base at 8.5%/year
3. Diesel fuel costs at 30.8 c/kWh other diesel (grid average) (consistent with YEC)
4. LNG delivered fuel costs at 14.0 c/kWh (assumes supply from Fortis at Tilbury, BC at an AECO gas price of \$4.50 per MMBtu plus \$0.30/MMBtu [to reflect Sumas equivalent price], using A-Train units for delivery to Watson Lake on route to Whitehorse with updated haul cost of \$6.59/MMBtu [\$5.99/MMBtu plus 10% for initial low utilization] (consistent with YEC)), adjusted for change in efficiency of units, resulting in total cost of LNG of 16.4 c/kWh
5. Capital includes cost of purchasing storage and vapourization equipment from ATCO Gas for \$2.025 million
6. GWh represent total forecast generation at the Watson Lake Plant.
7. O&M costs assume only Storage and Vapourization maintenance costs; transportation-related costs are included in the 16.4c/kWh rate for LNG FOB Watson Lake.
8. Assumed commissioned September 1 2015, displacing 70% of diesel for one 750 kW (95% availability) engine. Utilization ramps up to full plant converted at 50% displacement by mid-2016.

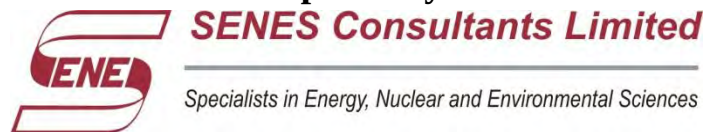
**Literature Review:
Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations**

Prepared for:



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28 November 2012

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1.0 INTRODUCTION

The Yukon Electrical Company Limited (YECL) is proposing to conduct a pilot-scale dual-fuelled power generation testing program at its current power generating station in Watson Lake, YK. The pilot-scale testing program will determine the feasibility of operating one of the diesel generators on a combination of diesel and natural gas. If the pilot scale program is successful, YECL will consider converting the remaining five units at the station to dual-fuelled operation.

YECL is proposing to use a ComAp Bi-Fuel™ system on a Cat 3508 700kW engine at the Watson Lake generating station. It should be noted that the term *Bi-Fuel* can be defined as the simultaneous combustion of two fuels. In the case of the Bi-Fuel System, natural gas is utilized in conjunction with diesel fuel to operate the engine. After conversion, the engine is able to operate on either 100% diesel fuel, or alternately, on a mixture of diesel fuel and natural gas (or other methane-based fuels). At no time would the engine be able to operate on natural gas exclusively. In practice, the terms *Bi-Fuel* and *Dual Fuel* are often used interchangeably, and this is the way that the terms are used in this report and in the literature cited in this report.

As part of the assessment of the dual-fuelled testing program, YECL retained SENES to provide assistance on air quality-related issues for the proposed testing program. SENES completed a dispersion modelling analysis of emissions from the existing diesel-fuelled generators at the Watson Lake station in 2009 in support of the station's permit renewal application. Since emissions for the dual-fuelled generators will differ from pure diesel-fuelled operation, a literature search was conducted to assess the potential effect that converting from diesel to dual-fuel operation might have on anticipated air contaminant emissions and subsequent air concentrations for common air contaminants.

Only a limited number of published papers were identified in the literature search which were considered to be directly applicable to the YECL pilot-scale testing program. However, the information gathered from these published studies is sufficient to provide an estimate of the likely changes in emissions that could result from the switch from diesel to dual-fuelled operation, and the potential effect these emission changes would have on predicted ambient concentrations based on the previous air dispersion modelling analysis.

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2.0 CHANGES IN EMISSIONS

The following provides a summary of information about the types of changes in emissions of nitric oxide (NO), carbon monoxide (CO), unburned hydrocarbons (HC), sulphur dioxide (SO₂) and soot or particulate matter (PM) that have been reported in published literature on the differences between operating power generators on diesel only and on a combination of diesel and natural gas.

2.1 NO EMISSIONS

The overall conclusion of all published sources reviewed for this report is that dual-fuel operation results in lower nitrogen oxide (NO_x) emissions. A study was performed by R.G. Papagiannakis and D.T. Hountalas (2003) observing emissions of contaminants during dual-fuel operation of a diesel engine using natural gas as the secondary fuel. The study showed that NO emissions are lower during dual-fuel operation when natural gas is used as the secondary fuel. According to the study,

“...a possible explanation...is the less intense premixed combustion, the reduction of gas temperature due to increase of the specific heat capacity, the slower combustion and finally the reduction of oxygen concentration due to presence of the natural gas mass ration, which replaces an equal amount of air in the cylinder charge.”

Abdelghaffar (2011), citing previous work by Papagiannakis and Hountalas, also stated that NO_x concentrations in exhaust are lower for dual-fuelled operation compared to normal diesel operation. This was also confirmed by R.G. Papagiannakis et al. (2010) who showed in a controlled study that:

“...for the same combination of engine operating conditions (i.e., engine speed and load), the increase of the liquid fuel supplementary ratio ($x > 0\%$) [the higher the percentage of natural gas] leads to lower NO concentrations compared to the ones observed under normal diesel operation ($x = 0\%$).”

The study also noted that at high loads and engine speeds, NO emissions start to increase beyond a certain natural gas percentage. R.G. Papagiannakis et al. (2010) speculate that this is caused by warmer engine temperatures and an increase in turbulence within the combustion chamber.

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Figure 2.1 shows the changes in NO emissions reported by Papagiannakis et al. (2010) for various engine loads, engine speeds and the relative proportion of natural gas substitution for diesel in the fuel. The authors reported that:

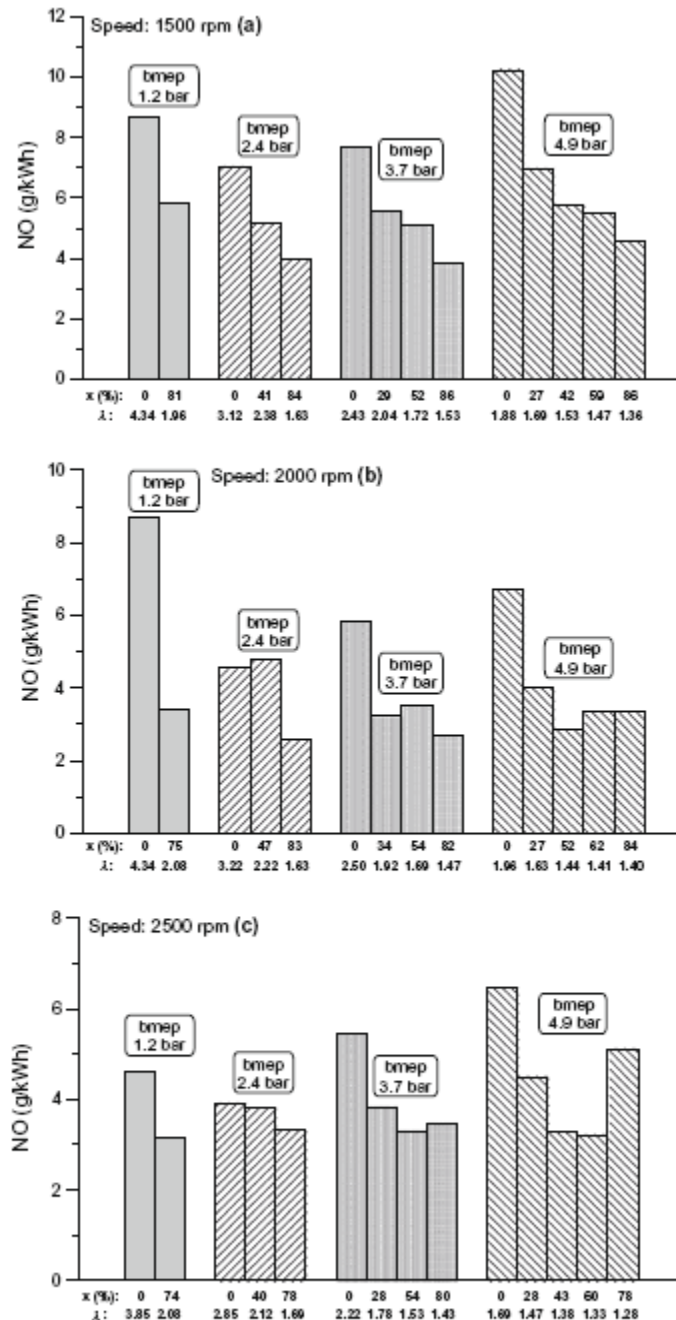
- at low and intermediate load conditions and for all engine speeds
 - Increased gaseous fuel substitution results in a decrease in NO emissions, with reductions of up to 60% at low load operation
- at high load and low engine speeds, NO emissions may be reduced by up to 47%
- at high load and high engine speeds, specific NO emission rates start to decrease with the increase in diesel fuel substitution rates, but still remain lower than when the engine is run on diesel alone.

At 80% load and high engine speed, Papagiannakis et al. (2010b) estimated that NO emission concentrations could, theoretically, approach or slightly exceed emissions under normal diesel fuel operations at high inlet air temperatures (90°C), but would remain lower than for diesel only operations at lower inlet air temperatures.

Similar results are shown in Sahoo et al. (2009), who reported that:

“...at low loads the NOx concentration under dual fuel operation is slightly lower compared to the one under normal diesel operating conditions...At higher load, the NOx concentration under dual fuel operation is considerably lower compared to the one under normal diesel operation.”

As indicated in Figure 2.2, Sahoo et al. reported that NOx concentrations under dual-fuel operations were slightly lower than for normal diesel operations at low engine loads, but considerably lower at high engine loads. The authors also noted that the increase in engine speed under dual-fuel operation resulted in further decreases in NOx concentrations as compared with normal diesel operation.

*Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations***Figure 2.1: NO Emissions at Various Loads, Engine Speeds and Natural Gas Percentages**
(Source: Papagiannakis et al. 2010)**Fig. 4.** Bar chart diagram of the emitted specific nitric oxide (NO) at various loads (bmep) as function of the supplementary ratio 'x' and corresponding total relative air-fuel ratio 'λ', for the engine speeds of 1500 rpm (a), 2000 rpm (b), and 2500 rpm (c).

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Figure 2.2: NO_x Emissions for Dual-fuel and Normal Diesel Operation at Various Loads and Engine Speeds (Source: Sahoo et al. 2009)

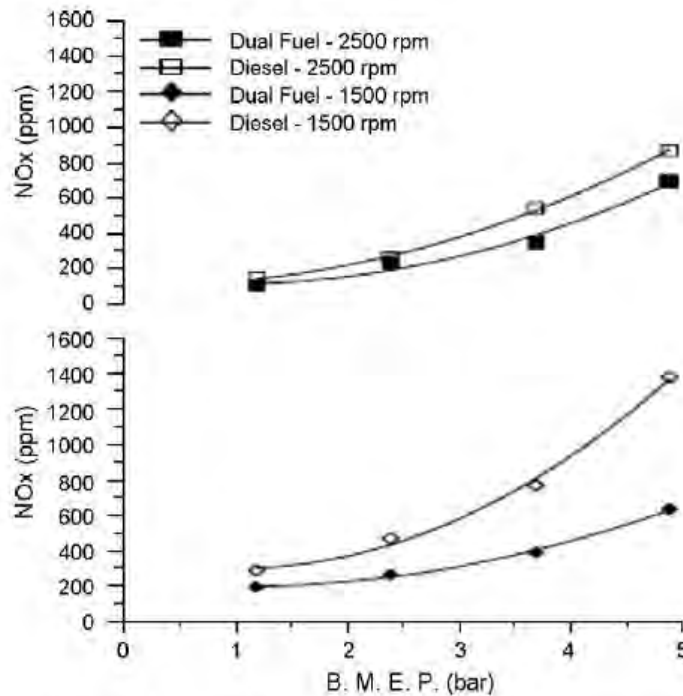


Fig. 10. Variation of nitric oxide under normal diesel and dual-fuel operation versus load at 1500 and 2500 rpm engine speed [19].

2.2 CO EMISSIONS

All published sources considered in this literature review were in agreement that dual-fuel operation results in an increase in CO concentrations in exhaust emissions. The increases are highest at low engine load and low inlet air temperatures, with theoretical maximum increases in CO emissions of up to 600% (Papagiannakis et al. 2010b). Emission increases of 200-300% for dual-fuel operations would be more typical at high engine loads.

According to the R.G. Papagiannakis and D.T. Hountalas (2003) study:

“..in general CO emission values under dual fuel operation are considerably higher compared to normal diesel operation.”

Increased CO emissions are a result of the slow combustion rate of the gaseous fuel, “*which maintains the charge temperature at low levels resulting [in] a reduction of the oxidation process of carbon monoxide*”.

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However, the study does note that with high engine loads (80% load), as mass ratios of natural gas increase above ~50%, CO emissions begin to decrease. This reduction is assumed to be the result of higher gas temperatures and faster combustion rates.

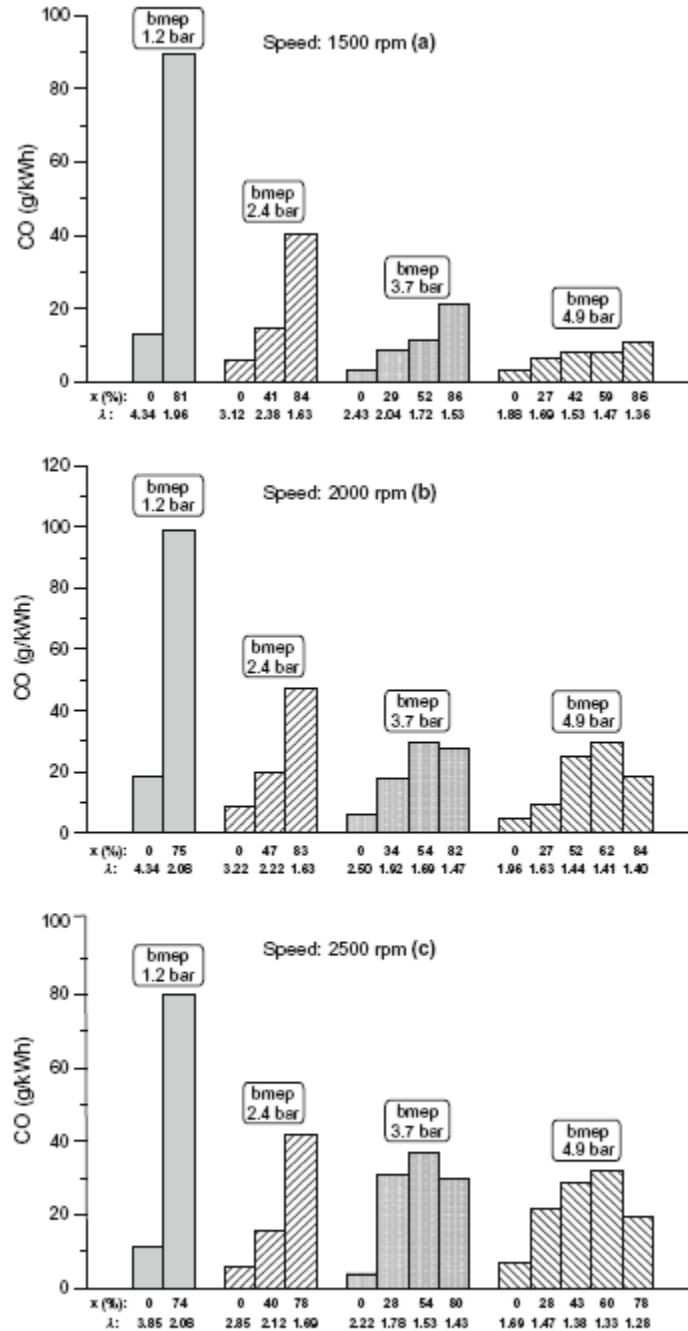
In Papagiannakis et al. (2010), tests showed that:

“for the same operating point (i.e., engine speed and load) CO emissions under dual fuel operation are significantly higher compared to the respective [emissions] under normal diesel operations.”

According to the 2010 study, and as indicated in Figure 2.3, this effect is more pronounced at low loads where the increase of CO emissions can be up to 600%. At intermediate loads, the maximum increase in CO emissions is up to 270%. At high engine loads and low engine speeds, the maximum increase in CO emissions is only 70% compared to that under normal diesel only operations.

Based on a third study performed by Papagiannakis et al. (2010b):

“..the negative impacts of dual fuel operation on CO emissions could be curtailed by preheating air intake and increasing pilot fuel quantity as well. However, this appears to affect negatively NO emissions with the effects [becoming] more intense at high engine load. Thus from the viewpoint of pollutant emissions, the increase of the pilot fuel quantity has to be accompanied by a limited increase of intake air temperature.”

*Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations***Figure 2.3: CO Emissions at Various Loads, Engine Speeds and Natural Gas Percentages**
(Source: Papagiannakis et al. 2010)**Fig. 5.** Bar chart diagram of the emitted specific carbon monoxide (CO) at various loads (bmep) as function of the supplementary ratio 'x' and corresponding total relative air-fuel ratio 'λ', for the engine speeds of 1500 rpm (a), 2000 rpm (b), and 2500 rpm (c).

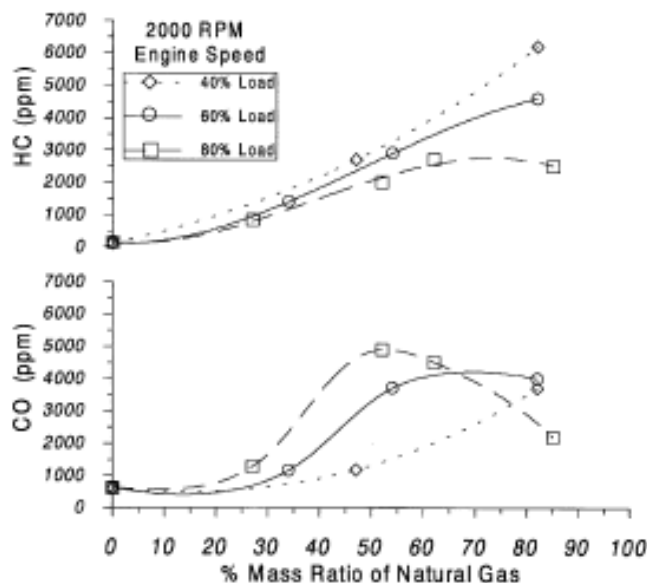
*Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations***2.3 UNBURNED HC EMISSIONS**

Emissions of unburned hydrocarbons can be expected to increase in dual-fuel mode operations as compared with diesel only operations. Papagiannakis and Hountalas (2003) showed that as the fractional mass ratios of natural gas increases in the fuel feed to the engine, unburned HC emissions increase for all load levels. The study speculated that this increase was caused by:

“..the filling of crevice volumes with unburned mixture of air and gaseous fuel during compression and combustion while the cylinder pressure continues to rise”.

Figure 2.4 indicates that, at low engine loads (i.e., 40% load factor), HC emissions increase with the increasing percentage of natural gas added to the dual fuel mix. As the load factor increases, the emission of unburned HC decreases somewhat, but always remains greater than that for normal diesel only operations. The magnitude of the increase may range from a 2500 fold increase at high load factor above the level and 70% natural gas ratio to over 6000 times that of diesel only operations at low load and 80% natural gas ratio.

Figure 2.4: Unburned HC and CO Concentrations as a Function of Natural Gas Ratio for Various Engine Loads (Source: Papagiannakis and Hountalas 2003)



The authors reported that in the high load scenario, the slight decrease in unburned HC emissions for the high load factor scenario observed after ~70% natural gas ratio is minimal. The slight decrease is attributed to higher burnt gas temperatures which promote oxidation of unburned

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hydrocarbons. These results were confirmed by Papagiannakis et al. (2010) who showed that the difference is “more intense at low load conditions, thus revealing the considerable amount of gaseous fuel escaping the combustion process.” This is illustrated in Figure 2.5 below.

Figure 2.5: Unburned HC Emissions at Various Loads, Engine Speeds and Natural Gas Percentages (Source: Papagiannakis et al. 2010)

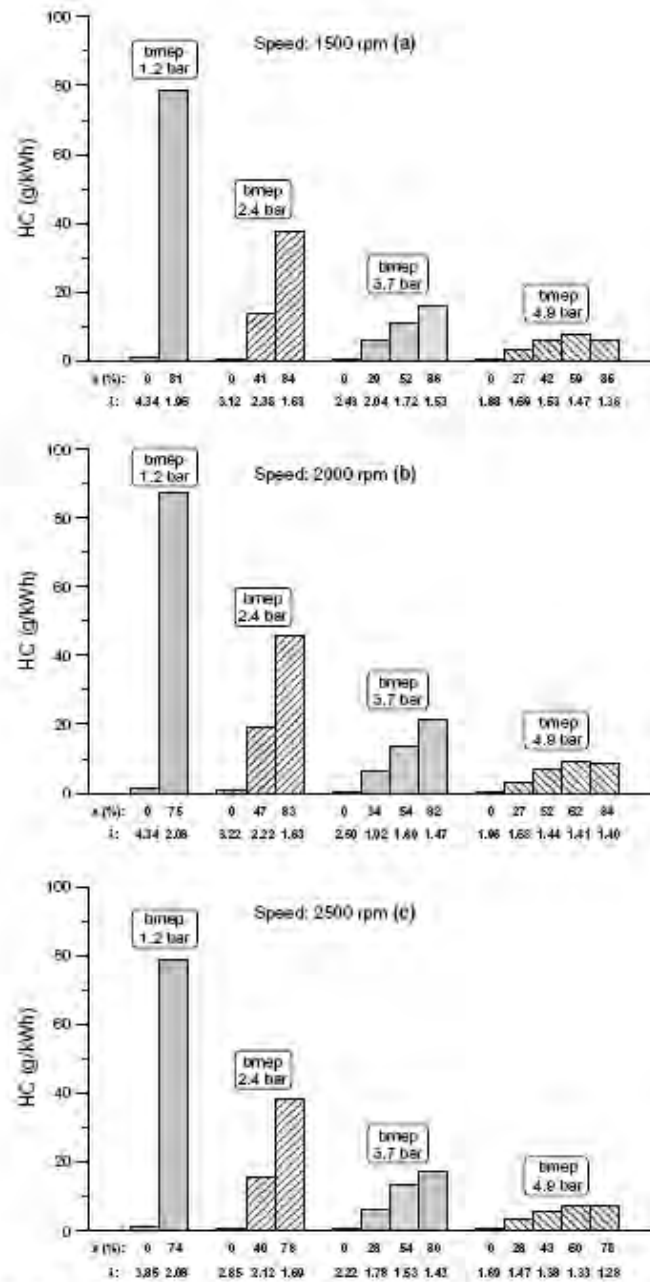


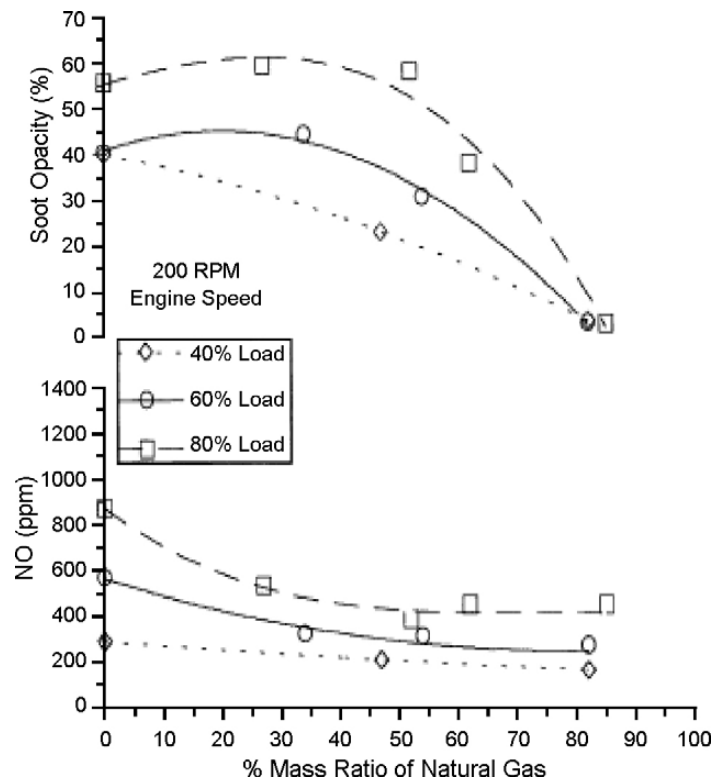
Fig. 6. Bar chart diagram of the emitted specific unburned hydrocarbons (HC) at various loads (bmep) as function of the supplementary ratio 'x' and corresponding total relative air-fuel ratio λ , for the engine speeds of 1500 rpm (a), 2000 rpm (b), and 2500 rpm (c).

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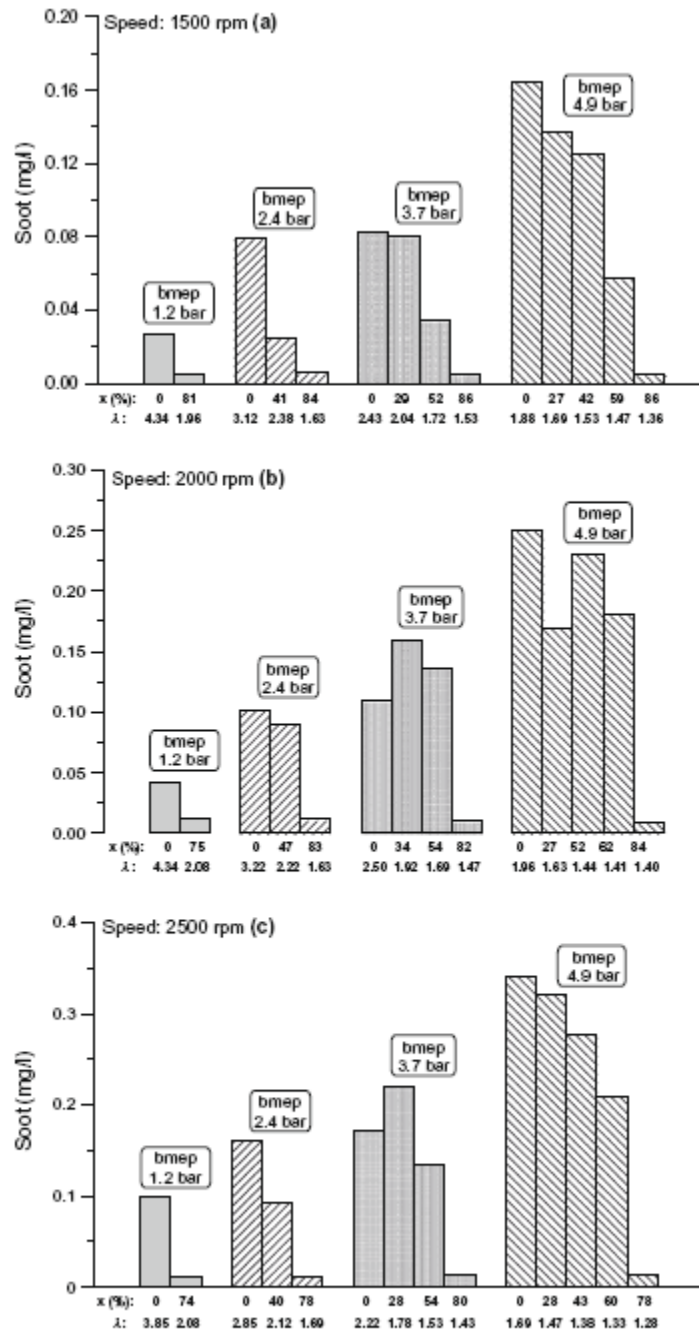
2.4 PARTICULATE MATTER (PM) OR SOOT

Dual-fuel operation results in substantially lower PM emissions as compared with normal diesel only operations, and this effect is greatest at high engine loads and near stoichiometric air-fuel ratios (Papagiannakis et al. 2010). This is illustrated in Figure 2.6.

Figure 2.6: Soot Opacity and NO Concentration as a Function of Natural Gas Ratio for Various Engine Loads (Source: Papagiannakis and Hountalas 2003)



Papagiannakis and Hountalas (2003) observed that soot production decreases at partial load factors as the percent mass ratio of natural gas increases. At higher loads and low percent mass ratios, soot initially increases (as the charge temperature is inferior to pure diesel operation), but then begins to decrease as the percent mass ratio of natural gas increases further. According to the authors: *“This is probably due to the higher gas temperature that promotes soot oxidation rate contributing to a further decrease of soot concentration”*. This is corroborated by Papagiannakis et al. (2010), however it was also reported in the latter study that, at high engine loads and an engine speed of 2000 rpm, an increase in PM emissions was noted between 27% and 52% natural gas, which was then reduced once more as the percentage of natural gas was increased further.

*Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations***Figure 2.7: Soot emissions at Various Loads, Engine Speeds and Natural Gas Percentages**
(Source: Papagiannakis et al. 2010)**Fig. 7.** Bar chart diagram of the emitted soot (smoke) density at various loads (bmep) as function of the supplementary ratio 'x' and corresponding total relative air-fuel ratio 'λ', for the engine speeds of 1500 rpm (a), 2000 rpm (b), and 2500 rpm (c).

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2.5 CONTROLLED FUELLING

A study conducted by Abdelghaffar (2011) examined the effect of dual-fuel versus controlled dual-fuel operation modes on air emissions. In controlled dual-fuel mode, the amount of diesel fuel injected into the engine with the natural gas is manually controlled. Experiments showed that while emissions of CO and HC increased in dual-fuel mode, the emission increases can be reduced if the amount of diesel fuel injected into the engine is controlled. Controlled fuel injection also decreases NOx emissions.

*Air Contaminant Emissions from Dual-Fuelled
and Conventional Diesel Generator Operations***3.0 CONCLUSIONS**

The overall conclusion of the literature review is that emissions of NO_x and PM from the pilot scale testing of one unit at the Watson Lake generating station would be expected to decrease in dual-fuel mode operation, while emissions of CO and unburned HC would be expected to increase. SO₂ emissions are a function of the amount of sulphur in the fuel fed to the engine. As such, any decrease in the overall amount of sulphur in dual-fuel operation as compared with diesel only operation will result in a proportional decrease in SO₂ emissions.

Table 3.1 lists the maximum predicted concentrations of common air contaminants for emissions from the six generating units at the YECL Watson Lake generating station based on diesel fuel operation. The data indicate that the incremental contribution (i.e., excluding background air quality from other sources) of YECL emissions to ambient air quality levels in Watson Lake is well below the ambient air quality standards that were adopted for the Yukon in 2010. The highest contributions are for 24-hour average PM_{2.5} and 1-hour average NO₂ concentrations. Under dual-fuel operation, the emission of both of these contaminants would be expected to decrease further. The YECL contribution to SO₂ concentrations is marginal, such that any changes in SO₂ emissions would have no measurable effect on ambient air concentrations.

Table 3.1: Summary of Maximum Predicted Concentrations for Simultaneous Operation of Six Diesel Engines at the YECL Watson Lake Generating Station

Pollutant	Timeframe	Maximum Predicted Concentration ¹ µg/m ³	Yukon Standards µg/m ³	% of Yukon Standard
NO ₂	1 Hour	88.40	400	22.1%
	24 Hour	26.77	200	13.4%
	Annual	1.44	60	2.4%
PM _{2.5}	24 Hour	8.81	30	29.4%
SO ₂	1 Hour	1.86	450	0.4%
	24 Hour	0.77	150	0.5%
	Annual	0.04	30	0.1%
CO	1 Hour	333.85	15000	2.2%

¹excluding background concentrations

However, as discussed in Section 2.2 above, CO emissions may increase substantially for dual fuel operations over current diesel only operations. The increase may be on the order of 200-270% under intermediate engine load operations, to as much as 600% increase at low engine load operations. At high engine load operations, the increase in CO emissions would be lower at only about 70% as compared with diesel only operations. Because the data in Table 3.1

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represent the joint contributions assuming the operation of all six units at the Watson Lake generating station, a 600% increase in CO emissions from the one unit undergoing dual-fuel pilot testing will not result in a concomitant 600% increase in the incremental impact of CO emissions from the station as a whole. Assuming an equal contribution from all six units to the maximum predicted 1-hour average CO concentration of $333.85 \mu\text{g}/\text{m}^3$, a 600% increase in CO emissions from the one dual-fuel pilot test unit would result in a maximum 1-hour average CO concentration of $612.06 \mu\text{g}/\text{m}^3$, or a factor 1.8 increase over the total CO concentration from all six units running on diesel alone. This would represent 4.1% of the Yukon ambient air quality standard for 1-hour average CO concentrations.

Although the emission of unburned hydrocarbons is likely to increase under dual-fuel operation more than for any other contaminant, the emission of these compounds is relatively low under diesel only operations. The primary HC contaminant of potential concern would be benzene. The increase in HC emissions will amount to a relatively large increase of small initial quantities. There are no Yukon ambient air quality standards for any of the HC contaminants whose emissions are likely to increase.

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CW-YECL-4

Reference: YECL Application, Appendix 4, Watson Lake Unit 2 replacement

Issue/sub-issue: Capital Expenditures

Preamble: YECL provides a business case for the Watson Lake replacement

Request:

- (a) In the business case, YECL refers to a project in the 2013-2015 General Rate Application. Please provide specific reference to where this project was addressed in the decision related to the 2013-2015 General Rate Application. In the response, please fully explain why the project was not completed in the 2013-2015 time frame. In the response, please provide the forecast and approved cost per year for this project.
- (b) Please explain how YECL was able to maintain safe and reliable service if the project was deferred.
- (c) Please provide the business case from the 2013-2015 General Rate Application related to the Watson Lake Unit 2 replacement. Further, please clearly identify all changes between the 2013-2015 business case and the current business case.
- (d) YECL provides a list of units 1-6. Please provide the overall lifecycle strategy for each unit, and the overall plan for the replacement of each unit.
- (e) On page 2 of the business case, in the background section, YECL discusses the AC Generator. Please fully explain how each of the diesel engine and the AC Generator have reached end of life.
- (f) In Figure 1, YECL provides the capacity of each unit. The installed capacity is 5,500 kW and the firm capacity is 4,050 kW. On page 2 of the business case, YECL asserts that there is a need for increased capacity based on recent peaks of 3,205 kW. YECL indicates that major overhauls take 4-6 weeks. Please fully explain why major overhauls are not scheduled for periods of low demand. In the response, please provide a graph that shows the monthly peak demand for each of the last 5 years.

Response:

- (a) Board Order 2014-06; Appendix A, Section 10.8 identifies major capital projects in which interveners took issue with and the resultant decision by the YUB. This project was not identified within this section.

As identified in the business case for this project in Appendix 4;

"The project was originally planned to be completed in 2015. After the replacement of Watson Lake Unit #4 in early 2014 the new unit became the main unit in the Watson Lake power plant. This resulted in a decrease of operating hours on all units including Unit #2. As a result ATCO Electric Yukon was able to defer this project to 2016."

- (b) A recent replacement of Unit #4 and scheduled maintenance to ensure availability and operation of the existing units allowed for the safe, reliable operation of the power system. AEY also has a mobile generator available if failure of the unit occurred before replacement.
- (c) Changes between the business case submitted in the 2013-2015 and current GRA in respect to the Watson Lake Unit 2 replacement project are:

- (1) Installed capacity of the power plant as Unit 4 was replaced in 2013.

	2013-2015 GRA	2016-2017 GRA
Capacity Unit 4 (kW)	1500	1450
Installed Capacity (kW)	5550	5500

- (2) Timeline for replacement; from 2015 to 2016 are due to less operating hours than expected.
- (3) Unit Capacity; a recent review of community loading resulted in a 1000 kW unit being selected.
- (4) Project cost; the original forecast cost for 2015 was \$1,350,000 and the current 2016 forecast is \$1,390,000.

The Watson Lake Unit 2 replacement business case from YECL's 2013-2015 GRA business case is provided for in CW-YECL-4(c) Attachment 1.

- (d) There are several facets to AEY's asset management strategy:

Operating Procedures

To ensure safe and efficient operation of its assets AEY follows manufacturer's guidelines for operation and maintenance. Protection settings are configured to prevent damage from occurring (i.e. thermal, over-speed, vibration, current, voltage, frequency, reverse power).

Maintenance Cycles

AEY maintains a forecast for the operating hours of its generating units. This forecast allows for the prediction, planning and preparation for manufacturer recommended maintenance work to be completed on its generating units at identified intervals.

Key Indicators

Key performance indicators are tracked and reported to help identify any unusual or poor performance from an asset.

Contingency Planning

For the isolated generation plants we intend to have firm capacity in excess of peak demand, even during downtime maintenance. This prevents scheduled maintenance from being interrupted by an unexpected contingency situation.

- (e) Replacement of low speed engines near the 100,000 hour mark is an industry practice. For example the Canadian Off Grid Utilities Association planning criteria for 1200 RPM units recommends replacement after 90,000 to 126,000 hours of operation. The current generator in operation was installed on a previous unit and as a result has an operational life in excess of 100,000 hours. When purchasing a new unit, acquiring a matched engine and generator set provided for optimal performance and full warranty from the manufacturer.
- (f) Operational hours, manufacturer guidelines and the current equipment condition are the primary drivers for overhauls. Major overhauls are normally scheduled during periods of low demand. An unplanned event that would cause a unit to be unavailable shifts dispatch priority of units and may cause another unit to operate more hours than originally planned. This could accelerate timelines for overhauls on a unit as operating hours increase unexpectedly.

Please refer to CW-YECL-4(f) Attachment 1 for a graph of the monthly peak demand for the last 5 years. Note that the monthly peaks are provided as the highest average demand over 1 hour whereas the annual peaks are the highest average demand over 1 minute. Using this method, all of the annual peaks will be higher than any of the monthly peaks from that year.



Business Case #13

Watson Lake Unit #2 Replacement



unit would affect plant capacity and contingency.

Technical Drivers:

Additional Generation Capacity Required to Meet Electrical Load: The Watson Lake plant had a recent peak of 3,205kW recorded for the community. With the addition of the new hospital and other forecasted residential loads, this peak is expected to rise. In the case of an unplanned loss of the largest unit in the Watson Lake plant (Unit #4), the remaining generators would not be able to be taken out of service for regular maintenance without negatively impacting customers. A major overhaul of a unit is usually 4-6 weeks in length; the minor overhauls are 1-2 weeks, during which time the unit is out of service.

Figure 1 – Watson Lake Generating Capacity

Watson Lake Generating Facility		
Unit #	Unit Name	Unit Size (kW)
1	CUL 422	800
2	CUL 257	800
3	CUL 352	1,000
4	CUL 258	1,500
5	CUL 466	650
6	CUL 423	800
Installed Capacity (kW)		5,550
Firm Capacity (kW)		4,050

Project Cost:

Forecast costs to complete this project, including the purchase and delivery of a new unit, radiator, heat exchanger and exhaust, and the installation of the unit and connection of its mechanical and electrical systems, are as follows:

· 2015 - \$1,350,000

Alternatives:

Alternative #1: Perform major overhaul on CUL 257. Based on previous operational experience, Yukon Electrical has seen marginal benefit in reliable operation of 1200RPM units that are overhauled past the 100,000 hour mark. The extensive hours on the unit have resulted in stresses and wearing that cannot be fully repaired. Factoring in the current age and state of the AC generator, this alternative does not return the unit to a satisfactory condition in terms of reliable and efficient operation.



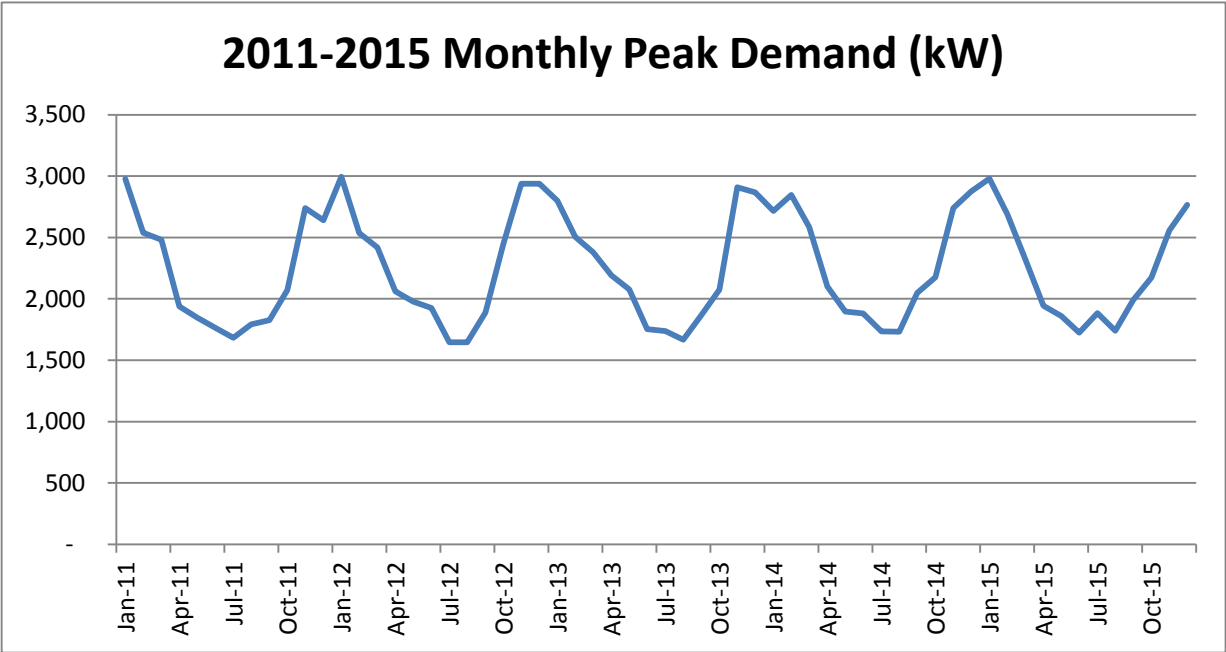
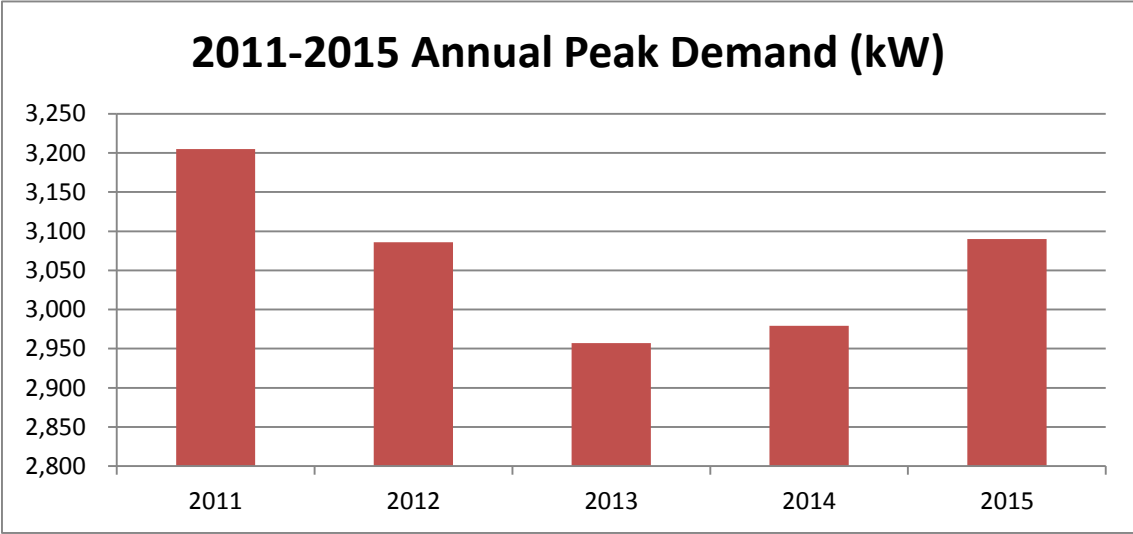
Alternative #2: Replace AC generator and perform major overhaul on unit CUL 257. AC generators are expected to run the life of the engine unit. Purchasing a new unit for another 15,000hrs or less of service is not an effective solution. The generator could be removed and refitted to another unit once CUL 257 is retired; however, this is not ideal as new units are best specified as an engine and generator matched set. Also, coupling this used AC generator to a new unit may, as the engine accumulates hours, put Yukon Electrical in a similar situation as it currently faces with CUL 257. As previously stated, a major overhaul and life extension on a diesel engine with more than 100,000 hours does not guarantee reliable operation.

Alternative #3: Replace CUL 258 with a new, larger size unit. This option addresses the end of life replacement of CUL 257 and the need for additional capacity in the Watson Lake facility.

Recommendation:

Proceed with replacement of CUL 257 with a unit of similar size and generating capacity to continue to meet the community's load and avoid further costs in respect of this unit, which will be at the end of its life.

Year	Annual Peak Demand (kW)
2011	3,205
2012	3,086
2013	2,957
2014	2,979
2015	3,090



CW-YECL-5

Reference: YECL Application, Appendix 5, Old Crow Unit 3 Replacement

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the business case.

Request:

- (a) In the business case, YECL refers to a project in the 2013-2015 General Rate Application. Please provide specific reference to where this project was addressed in the decision related to the 2013-2015 General Rate Application. In the response, please fully explain why the project was not completed in the 2013-2015 time frame. In the response, please provide the forecast and approved cost per year for this project.
- (b) Please explain how YECL was able to maintain safe and reliable service if the project was deferred.
- (c) Please provide the business case from the 2013-2015 General Rate Application related to the Old Crow Unit 3 replacement. Further, please clearly identify all changes between the 2013-2015 business case and the current business case.
- (d) Please provide the 2016 peak load, to the end of July 2016.
- (e) Under the heading "Load Growth," YECL discusses increased load. Please fully discuss changes in the Old Crow economy, and impacts on the peak load, since the forecast was prepared.

Response:

- (a) Board order 2014-06-Appendix A; Section 10.8 identifies major capital projects in which interveners took issue and the resultant decision by the YUB. This project was not identified within this section. A budget of \$500,000, with a timeline of the work being completed in 2015 was put forth and appeared in the in the 2013-2015 GRA.

Delivery time of the new unit was the primary driver for delay in completion of this project. A tender was carried out for the replacement unit in 2015. The resulting time to review proposals, award and receive the unit pushed construction into 2016.

- (b) During this time AEY carried out scheduled maintenance to ensure availability and operation of the units currently installed within the Old Crow generating system.
- (c) Changes between the business case submitted in the 2013-2015 GRA and current GRA in respect to the Old Crow Unit 3 replacement project are:
- (1) Timeline for replacement; 2013-2015 GRA business case proposed work to be completed in 2015; the current business case forecasts this work to be completed in 2016.
 - (2) Unit capacity; a 250 kW unit was proposed in the 2013-2015 GRA business case. This capacity was increased to 600 kW in the current business case after a review of community loading.
 - (3) Project cost. The estimated cost for this project in the 2013-2015 GRA business case was \$ 500,000, in the current business case the cost is \$1,262,000.

The Old Crow Unit 3 replacement business case from YECL's 2013-2015 GRA business case is provided for in CW-YECL-5(c) Attachment 1.

(d)

Month	Peak Demand (kW)
Jan-16	492
Feb-16	513
Mar-16	431
Apr-16	422
May-16	408
Jun-16	401
Jul-16	347

- (e) Load profiles for Old Crow are reviewed annually (at minimum) with the most recent forecast being revised in March 2016. The projects driving the load increase (those identified in the business case) are still expected to proceed. Vuntut Gwich'in Government shares its capital plan with AEY regularly.

It is important to note that priorities and schedules may shift with little notice depending on the community's and the Vuntut Gwich'in Government's priorities.



Business Case #15

Old Crow Unit #3 Replacement



Title: Old Crow Unit #3 Replacement

Summary: Purchase and install a new 250kW unit to replace the existing undersized 170kW unit (CUL 384). Load growth and load duration of Old Crow community have steadily diminished the utilization of the existing unit due to its rated capacity. The new 250kW unit will be installed in the new building in Old Crow (see Business Case #8), as it will not physically fit in the existing building, so the purchase of new switchgear and engine controls components is also required.

Project Description: Purchase new unit complete with manufacturer-supplied and sized, radiator, exhaust and heat exchanger. Unit is to be installed in the new building and, as a result, the purchase of switchgear and engine control components will be required. Install new unit and supplied devices, integrate unit into electrical supply and control systems, connect unit into waste heat and fuel systems.

Project Cost: 2015 - \$500,000

Business and Technical Drivers

Business Drivers: Primary function of utility to provide reliable and efficient supply of electrical energy.

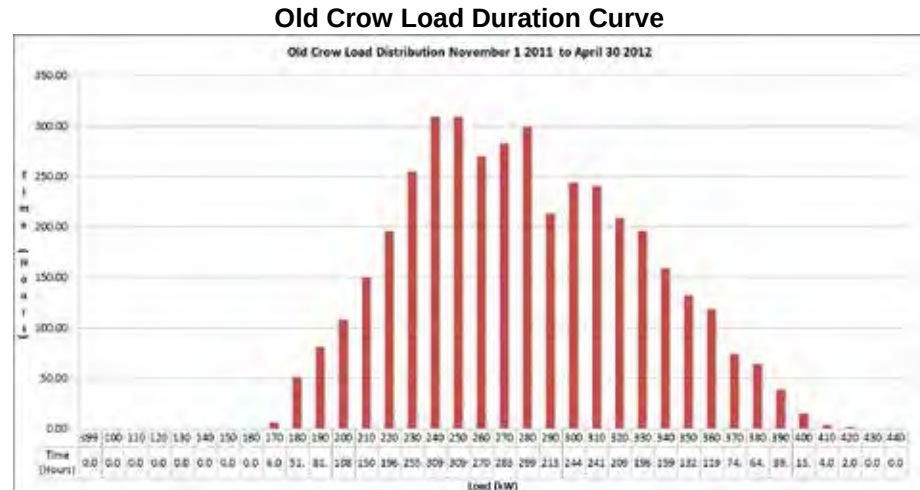
Technical Drivers: Load Growth: Load in Old Crow has grown and, as a result, the annual operational hours of CUL 384 have decreased significantly. In both 2011 and 2012, the unit ran less than 1,000 hours.

CUL 384 Annual Hours of Operation	
Year	Hours
2007	1576
2008	1209
2009	1003
2010	1015
2011	681
2012	939

The annual hours of operation have decreased due to the fact that the hourly average load did not drop under 170kW for the periods January 1 - May 1 and November 1 - December 31. This effectively reduced the Old Crow facility to a two engine plant during these periods. As can be seen in the chart below, the base load of Old Crow



through the winter months is higher than the rating of Old Crow Unit #3.



Plant Efficiency: The next largest unit is rated at 400kW and is dispatched to operate in the range of 150kW - 350kW. Operating at low load levels is inefficient and can negatively affect the unit as proper temperatures will not be maintained.

Alternatives:

Alternative # 1: Status quo; this will result in the Old Crow plant operating as a two unit plant for the majority of the year. In this configuration, when one of the remaining units is offline for scheduled maintenance or an unplanned condition, the plant will not meet the N-1 criteria.

Alternative # 2: Manufacturer was contacted to explore the possibility of increasing the output of the existing 170kW unit. This would decrease the life expectancy of unit. As this unit has completed approximately 75% of its life cycle, it may fail prematurely. Further retrofitting of the generator and other mechanical systems would also be needed. There is no guarantee or warranty for this work.

Alternative # 3: Replace Old Crow Unit #3 with a 250kW unit. This unit will provide a better heat rate for lower loads than the 400kW unit that is currently being used to operate at low load levels. Operational hours for Old Crow Unit #3 would improve.

Recommendation:

Replace Old Crow Unit #3 with a 250kW unit.

CW-YECL-6

Reference: YECL Application, Appendix 6, Destruction Bay Unit 2 Replacement

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the business case

Request:

- (a) In the business case, YECL refers to a project in the 2013-2015 General Rate Application. Please provide specific reference to where this project was addressed in the decision related to the 2013-2015 General Rate Application. In the response, please fully explain why the project was not completed in the 2013-2015 time frame. In the response, please provide the forecast and approved cost per year for this project.
- (b) Please explain how YECL was able to maintain safe and reliable service if the project was deferred.
- (c) Please fully explain any YECL strategy to manage generation units, or other assets, over their life cycle.
- (d) Please provide the business case from the 2013-2015 General Rate Application related to the Destruction Bay Unit 2 replacement. Further, please clearly identify all changes between the 2013-2015 business case and the current business case.
- (e) Please provide the 2016 peak load, to the end of July 2016.

Response:

- (a) In Board order 2014-06; Appendix A, Section 10.8 identifies major capital projects in which interveners took issue and the resultant decision by the YUB. This project was not identified within this section. The project was to be completed in 2015. Delivery time of the new unit was the primary driver for delay in completion of this project. A competitive tender was carried out for the project in 2015 and the delay in receiving the unit pushed construction into 2016.

- (b) A recent replacement of unit #3 and scheduled maintenance to ensure availability and operation of the existing units allowed for the safe, reliable operation of the power system. AEY also has a mobile generator available if failure of the unit occurred before replacement.

- (c) There are several facets to our asset management strategy:

Operating Procedures

To ensure safe and efficient operation of its assets AEY follows manufacturer's guidelines for operation and maintenance. Protection settings are configured to prevent damage from occurring (i.e. thermal, over-speed, vibration, current, voltage, frequency, reverse power).

Maintenance Cycles

AEY maintains a forecast for the operating hours of its generating units. This forecast allows for the prediction, planning and preparation for manufacturer recommended maintenance work to be completed on its generating units at identified intervals.

Key Indicators

Key performance indicators are tracked and reported to help identify any unusual or poor performance from an asset.

Contingency Planning

For the isolated generation plants we intend to have firm capacity in excess of peak demand, even during downtime maintenance. This prevents scheduled maintenance from being interrupted by an unexpected contingency situation.

- (d) Changes between the business case submitted in the YECL 2013-2015 GRA and current GRA in respect to the Destruction Bay Unit 2 replacement project are:
- (1) The project will be completed in 2016 due to delays in the delivery.
 - (2) Unit Capacity. A similar sized unit was proposed in the YECL 2013-2015 GRA business case. As the result of a review of the plant operation and community loading carried out prior to tender the capacity is now 400kW in the current business case.

- (3) Project cost. The estimated cost for this project in the YECL 2013-2015 GRA business case was \$ 600,000; in the current business case has been increased to \$758,000.

Please refer to CW-YECL-6(d) Attachment 1 for the YECL 2013-2015 GRA business case for Destruction Bay Unit 2.

(e)

Month	Peak Demand (kW)
Jan-16	363
Feb-16	356
Mar-16	384
Apr-16	270
May-16	268
Jun-16	262



The Yukon Electrical Company Limited
An **ATCO** Company

Business Case #14

Destruction Bay Unit #2 Replacement



The Yukon Electrical Company Limited
An **ATCO** Company

Title: **Destruction Bay Unit #2 Replacement**

Summary: Replace Unit #2 in Destruction Bay, which is at the end of its life, with a new diesel generator. Based on forecast load growth and Yukon Electrical's planning criteria, the new unit is planned to have similar generating capacity in comparison to the existing unit.

Project Description: Purchase new unit complete with a manufacturer-supplied and specified radiator, exhaust and heat exchanger. Remove existing unit and install new unit and supplied devices, integrate unit into electrical supply and control systems, and connect unit into waste heat and fuel systems.

Project Cost: 2014 - \$600,000

Business and Technical Drivers

Business Drivers: The primary function of the utility is to provide a safe and reliable supply of electrical energy.

Technical Drivers: As of January 2013, the existing unit has 93,054 operating hours. Based on a five-year average, this unit is forecast to run 4,354 hours annually in each of 2013 and 2014 and, as a result, is forecast to have approximately 100,000 operating hours at the time of replacement. Canadian Off Grid Utilities Association planning criteria for 1200 RPM units recommends replacement after 90,000 to 126,000 hours of operation.

Alternatives: Alternative #1: Perform a life extension on the existing unit. Yukon Electrical has determined that life extensions performed on units in excess of 100,000 operational hours do not guarantee reliable operation. The unit may not operate long enough to provide payback of the life extension investment. The result would be poor reliability which could lead to unplanned outages and poor customer service. Replacement of a failed unit in an unplanned situation would leave significant exposure time to inadequate capacity and the lead time to procure and obtain units of this rating can vary from three to nine months.

Alternative # 2: Run unit to failure and not replace. The 2011 recorded system peak load was 389kW and the 2012 peak load was 415kW. The removal of Unit #2, without replacement, would not provide enough available generation to ensure 110% of peak loading with largest unit



The Yukon Electrical Company Limited
An **ATCO** Company

removed (N-1 criteria).

Alternative # 3: Replace unit with a new, similarly sized unit.

Recommendation:

Replace of Destruction Bay Unit #2 in 2014 with a unit of similar size and generating capacity to avoid further costs in respect of this unit, which is at the end of its life.

CW-YECL-7

Reference: YECL Application, Appendix 7, Whistle Bend Subdivision Stage 3c

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the reasonableness of the YECL forecast.

Request:

- (a) Please provide a detailed cost breakdown that identifies the costs between High Voltage cable Low Voltage Cable, Duct Systems for cables, Transformers, Pad-mounted Switching devices, Low Voltage pedestals, Streetlights, related labour or installation for each item, overheads, number of services installed,
- (b) Please provide data similar to the data provided in response to (a) above, for each of Stage 1 and 2.
- (c) Please confirm that the streetlights being installed are LED street lights. If not confirmed, please fully explain.

Response:

- (a) The design for Stage 3c currently has not been finalized. The design remains with the Yukon Government and the City of Whitehorse to finalize. As a final design is not complete, AEY does not have final counts and material required for High Voltage cable, Low Voltage cable, Duct Systems, Transformers, Pad-mounted Switching devices, Low Voltage pedestals, Streetlights and the number of services that will be installed. As such, AEY does not have a detailed estimate prepared at this time.
- (b) Please refer to table below.

Whistle Bend Cost Summary Stages 1 & 2	
Material	1,716,820.67
Labour	858,243.02
Total Project	2,575,063.69
<i>Company investments are not included in these amounts</i>	
Street Lights	224,613.09
Primary Cable	221,989.10
Secondary Cable	86,544.95
Pedestals	64,996.47
Transformers	169,858.51
Other	948,818.55
Total Material Cost	1,716,820.67

- (c) For the local streets, AEY has proposed decorative LED options to the City of Whitehorse. LED street lights are planned for Casca Boulevard (main feeder road) and need to be approved by the developer.

CW-YECL-8

Reference: YECL Application, Appendix 8, McIntyre Substation Replacement

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the reasonableness of the forecasts

Request:

- (a) Please provide the business case from the 2013-2015 GRA that was approved in Board Order 2014-06.
- (b) Please clearly indicate any changes to the business case, including changes in scope, schedule, or costs.
- (c) Please provide a reconciliation of the costs for each of 2016 and 2017 included in this GRA to the forecast costs from the business case.
- (d) Please confirm that the streetlights to be installed are LED street lights. If not confirmed, please fully explain.

Response:

- (a) Please refer to CW-YECL-8(a) Attachment 1.
- (b) The scope and changes to the original business case attached in (a) are outlined in Attachment 11.4 in this Application. The complete schedule for the project is described on page 3 in Appendix #8 of this Application.
- (c) There were no forecast costs for 2016 and 2017 in the YECL 2013-2015 GRA business case.
- (d) The street lights in McIntyre subdivision will be LED streetlights.



Business Case #22

McIntyre Subdivision Replacement Stage 1



Title: McIntyre Subdivision Replacement Stage 1

Summary: This project is to replace the existing 34.5kV underground infrastructure, which was built circa 1977, with new 25kV infrastructure within McIntyre subdivision in Whitehorse due to the end of life condition of the infrastructure. The end of life assessment is based on the degradation of cables and electrical equipment along with inoperability due to safety reasons at many locations throughout the subdivision.

Project Description:

Replacement of all high and low voltage distribution cables, transformers, and high voltage switch cubicles in an underground configuration throughout McIntyre subdivision.

The project will be done in stages to effectively build, transfer and complete construction during the short construction season in the Yukon. The construction plan will be discussed with and have approval of the community as all work will be done curbside in close proximity to property lines.

The majority of low voltage service lines to residences will not be replaced. Many of these services were located and inspected over the last five years in coordination with the subdivision fencing project that Kwanlin Dun First Nation (KDFN) completed.

The electrical infrastructure in the undeveloped areas of the subdivision will not be replaced at this time. An agreement will be put in place to replace that infrastructure when the area is developed.

Project Cost:

2013 - \$475,000
2014 - \$250,000

Business and Technical Drivers

Business Drivers: The electrical infrastructure is circa 1977. There have been failures of high voltage cables that have caused extended outages to a large number of customers. There are many pieces of equipment (transformers and switch cubicles) that cannot be operated safely. Also, there are many cable switch points that cannot be operated at all. This makes troubleshooting and sectionalizing of the distribution system impossible during unplanned outages in many areas of the subdivision. Some equipment cannot be operated due to poor cable condition and is tagged as inoperable in the field. This equipment is in service and can only be serviced or operated by isolating a larger area of the



subdivision to complete work safely.

Technical Drivers:

The high voltage terminations have been discontinued for 10 plus years. Yukon Electrical has a small number of emergency replacements in inventory. There is no availability of these electrical parts. Yukon Electrical also has a limited supply of replacement transformers and high voltage switch cubicles.

Inoperability of the system in multiple locations. This is due to installation as direct buried cable as well as transformers and switch cubicles installed without underground vaults. There is no ability to fix the issue temporarily.

Physical condition of metal service pedestals and transformers have deteriorated and are rusting.

Alternatives:

Alternative #1: Status quo. Underground cable will continue to degrade to the point of failure. Unplanned extended outages to troubleshoot the electrical distribution in the subdivision and repair. Continue to accept the inoperability of the system. Not recommended.

Alternative #2: Replace underground system with overhead electrical infrastructure. Service guidelines in the City of Whitehorse mandate underground electrical service to remain as underground. Not possible.

Alternative #3: Replace end of life underground electrical system.

Recommendation:

Replace the existing 34.5kV underground infrastructure, which is at the end of its life, with new 25kV infrastructure within McIntyre subdivision.

CW-YECL-9

Reference: YECL Application, Appendix 9, Downtown Whitehorse Capacity Improvements.

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the business case.

Request:

- (a) YECL indicates that the driver for the project is load growth in downtown Whitehorse. Please provide total load, number of customers, and peak demand, by month for each of the last five years, for downtown Whitehorse.
- (b) Please confirm that YECL is planning to replace like for like, such as overhead for overhead, an underground for underground. If not confirmed, please fully explain.
- (c) Please confirm that, after completion of this project, YECL will be in compliance with all municipal bylaws and regulations. If not confirmed, please fully explain.
- (d) Please provide an estimate of the incremental cost if all overhead was replaced with underground in the downtown Whitehorse area.

Response:

- (a) Please refer to YUB-YECL-17(b) Attachment 1 – Downtown Whitehorse Capacity Improvement Technical Appendix. Section 2.2 and 2.3 identify the historical and forecasted load growth in downtown Whitehorse.
- (b) AEY will replace like for like (i.e. overhead for overhead and underground for underground) as electrical codes and design criteria allow. In the case of a separation conflict with an existing overhead line it may need to be converted to underground.
- (c) AEY has been working to ensure compliance with all regulatory and legislative requirements for this project. AEY anticipates full compliance and does not foresee any deviation.

(d) On this project there are three pieces to consider:

1. Install Selkirk Substation: This substation was designed as a hybrid overhead and underground substation to find a balance between cost, impact to the surroundings and land area used. Changing the scope to be a 100% underground, greenfield construction, the substation would increase the project costs by roughly \$280,000.
2. Reconductor South River Crossing: Part of this line is already underground as the line passes the SS Klondike site. The cost to put the river crossing conductors on the bridge is approximately an additional \$250,000. This option would also bring increased operating costs to inspect and maintain infrastructure on the bridge.
3. Install New Switching Points: This work does not have an incremental cost to convert to underground without significantly expanding the scope of the project. Conversion to underground would involve converting an entire block or more of overhead line to underground, rather than only adding a gang switch.

CW-YECL-10

Reference: YECL Application, Appendix 10, Paint Mountain Cable Replacement.

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the business case.

Request:

- (a) Please provide a detailed cost estimate for each of the three alternatives.
- (b) Please provide any analysis or reports that demonstrate that the cable is at end of life.

Response:

(a)

Alternative	Description	Cost	Estimate
1	Replace in place	\$417,000	Detailed desktop estimate
2	Install generation	\$500,000 to \$1,000,000	Quote from generator supplier and experience from other utility installations
3	Cable Injection	N/A	This alternative is no longer feasible
4	Proposed Project	\$562,000	Site visit and detailed desktop estimate

The effort put toward each cost estimate corresponds to the viability and degree to which each alternative addresses the project driver. The table above shows the estimate for each alternative as well as the basis and inputs to that cost. Alternatives 1 and 4 received a more detailed estimate as they were the most viable solutions from an operations and cost perspective. Alternative 3 started with discussions with a cable injection contractor, who initially indicated that it was feasible to do cable injection on the rubber insulated cable. During later discussions, after the contractor reviewed detailed maps and technical information, it was deemed not feasible to pursue cable injection. Further, the disconnection of the site from the hydro grid to install a diesel-photovoltaic hybrid generation system does not align with diesel displacement and efficiency goals and would result in higher life cycle costs.

- (b) The determination that the cable serving Paint Mountain customers is at or nearing end of life is based on three factors:
1. Comparing cable age to life expectancy as described in industry literature and experience. Modern cables are expected to have a useful life of 30-50 years. The cable at Paint Mountain is over 50 years old.
 2. Experience with this type of cable: The cable is rubber insulated with three conductors in a single cable. Manitoba Hydro has had poor reliability experience with this type of cable and has been actively replacing them since 1996.
 3. General condition of the cable: The cable is presently damaged and cannot be repaired. AEY has de-rated the cable from three phase use to single phase use only.

CW-YECL-11

Reference: YECL Application, Appendix 11, Destruction Bay Unit 3 Replacement

Issue/sub-issue: Capital Expenditures

Preamble: CW requires information to assess the business case.

Request:

- (a) In the business case, YECL refers to a project in the 2013-2015 General Rate Application. Please provide specific reference to where this project was addressed in the decision related to the 2013-2015 General Rate Application. In the response, please fully explain why the project was not completed in the 2013-2015 time frame. In the response, please provide the forecast and approved cost per year for this project.
- (b) Please explain how YECL was able to maintain safe and reliable service if the project was deferred.
- (c) Please fully explain any YECL strategy to manage generation units, or other assets, over their life cycle.
- (d) Please provide the business case from the 2013-2015 General Rate Application related to the Destruction Bay Unit 2 replacement. Further, please clearly identify all changes between the 2013-2015 business case and the current business case.
- (e) Please provide the 2016 peak load, to the end of July 2016.

Response:

- (a)
 - i. The project was included in the YECL 2013-2015 GRA on page 9-54 under 2014 Capital Expenditures. This project was not specifically addressed in the board decision; however, general comments relating to it are presented in Section 10.6 *Other Projects* on page 69 of Board Order 2016-06 Appendix A.
 - ii. The project was completed within the 2013-2015 timeframe.

- iii. The project is complete and the actual costs and time frame are provided in Appendix 11.
- (b) The project was not deferred. The unit was put into service in Q4 2014.
- (c) There are several facets to our asset management strategy:

Operating Procedures

To ensure safe and efficient operation of its assets AEY follows manufacturer's guidelines for operation and maintenance. Protection settings are configured to prevent damage from occurring (i.e. thermal, over-speed, vibration, current, voltage, frequency, reverse power).

Maintenance Cycles

AEY maintains a forecast for the operating hours of its generating units. This forecast allows for the prediction, planning and preparation for manufacturer recommended maintenance work to be completed on its generating units at identified intervals.

Key Indicators

Key performance indicators are tracked and reported to help identify any unusual or poor performance from an asset.

Contingency Planning

For the isolated generation plants we intend to have firm capacity in excess of peak demand, even during downtime maintenance. This prevents scheduled maintenance from being interrupted by an unexpected contingency situation.

- (d) Please refer to CW-YECL-6(d) Attachment 1 for a copy of the YECL 2013-2015 GRA business case for Destruction Bay Unit 2 Replacement. There was no business case submitted for Destruction Bay Unit 3 Replacement in the YECL 2103-2015 GRA as the forecast costs were \$450,000. There was a detailed write up provided on page 9-54 as below:

"Purchase new unit complete with new manufacturer supplied and sized, radiator, exhaust, and heat exchanger. Remove existing unit, install new unit and supplied devices, integrate unit into electrical supply and control systems, connect unit into waste heat and fuel system."

(e)

Month	Peak Demand (kW)
Jan-16	363
Feb-16	356
Mar-16	384
Apr-16	270
May-16	268
Jun-16	262

CW-YECL-12

Reference: N/A

Issue/sub-issue: Operation and Maintenance

Preamble: In proceedings in Alberta, ATCO utilities are charged a license fee. CW requires information to understand if YECL customers are being asked to pay a license fee to ATCO.

Request:

- (a) Please fully explain if YECL is including any forecast for a license fee, name fee, signature rights or any other charge paid to any parent or affiliate. If such a fee, or charges in lieu of such a fee, is included in forecast costs, please fully explain why such a fee should be paid by customers.

Response:

- (a) AEY has not included any license fee, name fee, or signature right costs in the forecast costs.

CW-YECL-13

Reference: YECL Application, Section 5

Issue/sub-issue: Operation and Maintenance

Preamble: In the table on page 5-1, actual total Operation and Maintenance is \$11,718,000 in 2013, \$11,698,000 in 2014, and \$11,616,000 in 2015. This is a downward trajectory. In 2016 and 2017 forecast total O&M increases each year.

Request:

- (a) Please fully explain why actual O&M is on a downward trend, yet forecast O&M increases each year.
- (b) Please provide a table, in Excel format, similar to the table on page 5-1, which indicates cost per kWh, and cost per customer for each line in the table. In the response, please provide the supporting calculations as well as customers and sales.

Response:

- (a) Actual O&M was on a downward trend from 2013 to 2015 mainly due to declining pension costs and lower IT costs.

Please refer to responses to YUB-YECL-40 through YUB-YECL-46 for further variance explanations.

- (b) Please refer to CW-YECL-13(b) Attachment 1 and CW-YECL-13(b) Attachment 2.

The Yukon Electrical Company Limited
2016 - 2017 General Rate Application
Operations and Maintenance Expenses per MWh
(\$ per MWh)

Line No.	Description	Cross Ref.	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Test Period 2016	Test Period 2017
1	Sales (MWh)	S.2.1 L48 x 1000	316,692	310,232	312,181	324,162	315,816	330,612	313,592	319,289
2										
3	Production per MWh									
4	62600 - Hydro Generation per MWh	S.5.1 L.2 / L.1	0.63	0.98	0.73	1.08	0.82	1.33	0.86	0.84
5	64000 - Supervision and Engineering Diesel per MWh	S.5.1 L.3 / L.1	0.20	0.19	0.20	0.20	0.21	0.20	0.23	0.23
6	64600 - Diesel Generation per MWh	S.5.1 L.4 / L.1	1.15	1.29	1.30	1.33	1.40	1.36	1.56	1.60
7	82600 - Hydro Maintenance per MWh	S.5.1 L.5 / L.1	0.19	0.15	0.19	0.15	0.20	0.16	0.22	0.27
8	84600 - Diesel Maintenance per MWh	S.5.1 L.6 / L.1	3.22	3.76	2.86	3.83	3.63	3.90	3.75	3.51
9			5.39	6.37	5.30	6.58	6.26	6.95	6.62	6.44
10	Distribution per MWh									
11	87000 - Supervision per MWh	S.5.1 L.9 / L.1	0.89	0.88	0.96	0.91	1.03	0.94	1.05	1.08
12	87100 - Brushing per MWh	S.5.1 L.10 / L.1	1.33	1.26	0.84	1.29	1.38	1.31	1.31	1.34
13	87200 - Vehicle Depreciation per MWh	S.5.1 L.11 / L.1	(0.70)	(0.58)	(0.65)	(0.59)	(0.66)	(0.60)	(0.67)	(0.68)
14	87300 - Maintenance per MWh	S.5.1 L.12 / L.1	5.97	5.91	6.28	6.11	6.09	6.26	6.58	6.75
15	87310 - Service to Outside Parties per MWh	S.5.1 L.13 / L.1	0.36	0.33	0.34	0.33	0.43	0.34	0.38	0.39
16	87400 - Underground Line Maintenance per MWh	S.5.1 L.14 / L.1	0.49	0.51	0.35	0.53	0.45	0.54	0.47	0.49
17	87500 - Meter and Meter Testing per MWh	S.5.1 L.15 / L.1	0.60	0.27	0.30	0.28	0.29	0.29	0.30	0.30
18	87700 - Transformer Repair and Replacement per MWh	S.5.1 L.16 / L.1	0.24	0.23	0.15	0.24	0.13	0.25	0.17	0.17
19	87800 - Street Light Maintenance per MWh	S.5.1 L.17 / L.1	0.75	0.58	0.80	0.60	0.64	0.61	0.79	0.81
20			9.93	9.40	9.37	9.70	9.78	9.94	10.37	10.65
21	General per MWh									
22	88400 - Communication per MWh	S.5.1 L.20 / L.1	0.06	0.04	0.08	0.04	0.08	0.04	0.08	0.08
23	88800 - Maintenance Company-Owned Houses per MWh	S.5.1 L.21 / L.1	0.06	0.05	0.09	0.05	0.15	0.06	0.19	0.19
24	88900 - Maintenance Warehouse and Office per MWh	S.5.1 L.22 / L.1	0.45	0.41	0.51	0.42	0.46	0.42	0.51	0.52
25			0.56	0.50	0.68	0.51	0.68	0.52	0.78	0.79
26	Public Information per MWh									
27	70100 - Public Information Administration per MWh	S.5.1 L.25 / L.1	0.07	0.08	0.04	0.08	0.03	0.09	0.05	0.05
28	70200 - General Public Information per MWh	S.5.1 L.26 / L.1	0.38	0.37	0.53	0.38	0.34	0.39	0.39	0.45
29			0.45	0.45	0.57	0.46	0.37	0.48	0.44	0.50
30	Customer Accounting per MWh									
31	71000 - Supervision per MWh	S.5.1 L.29 / L.1	0.15	0.16	0.14	0.16	0.14	0.17	0.15	0.15
32	71100 - Customer Applications and Service Orders per MWh	S.5.1 L.30 / L.1	1.35	1.38	1.36	1.44	1.48	1.48	1.55	1.60
33	71200 - Meter Reading per MWh	S.5.1 L.31 / L.1	1.77	1.66	1.76	1.72	1.89	1.78	1.98	2.04
34	71300 - Customer Billing and Accounting per MWh	S.5.1 L.32 / L.1	2.28	2.29	2.44	2.37	1.89	2.45	1.95	1.99
35	71400 - Revenue Collections per MWh	S.5.1 L.33 / L.1	0.58	0.60	0.62	0.68	0.53	0.70	0.55	0.56
36	71500 - Collection of Delinquent Accounts per MWh	S.5.1 L.34 / L.1	0.43	0.38	0.41	0.42	0.40	0.43	0.41	0.42
37	71800 - Provision for Uncollectible Accounts per MWh	S.5.1 L.35 / L.1	0.24	0.11	0.38	0.11	0.20	0.11	0.27	0.28
38			6.79	6.58	7.12	6.90	6.53	7.12	6.85	7.04
39	Administration and General per MWh									
40	72100 - Administrative per MWh	S.5.1 L.38 / L.1	7.14	6.98	7.21	7.04	6.20	6.56	7.29	7.44
41	72200 - Administrative Corporate per MWh	S.5.1 L.39 / L.1	0.34	0.42	0.48	0.43	0.41	0.44	0.45	0.46
42	72300 - Insurance per MWh	S.5.1 L.40 / L.1	0.74	0.83	0.48	0.64	0.28	0.44	0.32	0.32
43	72400 - Injuries & Damages per MWh	S.5.1 L.41 / L.1	1.95	1.95	1.95	1.95	1.95	1.95	0.35	0.35
44	72500 - Employee Expenses per MWh	S.5.1 L.42 / L.1	0.86	0.85	1.15	0.87	0.94	0.89	1.06	1.08
45	72600 - Training and Safety per MWh	S.5.1 L.43 / L.1	1.42	1.38	1.48	1.42	1.47	1.47	1.59	1.64
46	72700 - Relocation per MWh	S.5.1 L.44 / L.1	0.76	0.50	0.53	0.51	1.37	0.52	1.16	1.16
47	72800 - Miscellaneous General per MWh	S.5.1 L.45 / L.1	0.02	0.00	-	0.00	-	0.00	0.01	0.01
48	72900 - Audit/Legal Fees & Special Studies per MWh	S.5.1 L.46 / L.1	0.64	0.42	0.62	0.49	0.44	0.43	0.58	0.59
49			13.88	13.34	13.91	13.36	13.06	12.70	12.81	13.05
50										
51	Total Operations and Maintenance Expenses per MWh		37.00	36.64	36.94	37.52	36.68	37.72	37.87	38.46

The Yukon Electrical Company Limited
2016 - 2017 General Rate Application
Operations and Maintenance Expenses per Customer
(\$ per Customer)

Line No.	Description	Cross Ref.	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Test Period 2016	Test Period 2017
1	Number of Customers	S.2.1 L45	17,116	17,116	17,351	17,306	17,624	17,597	17,854	18,082
2										
3	Production per Customer									
4	62600 - Hydro Generation per Customer	S.5.1 L.2 / L.1	11.62	18.11	13.59	20.02	15.23	24.63	15.96	15.47
5	64000 - Supervision and Engineering Diesel per Customer	S.5.1 L.3 / L.1	3.73	3.51	3.79	3.62	3.85	3.73	4.19	4.30
6	64600 - Diesel Generation per Customer	S.5.1 L.4 / L.1	21.24	23.93	24.13	24.52	25.97	25.17	28.88	29.55
7	82600 - Hydro Maintenance per Customer	S.5.1 L.5 / L.1	3.48	2.78	3.48	2.84	3.63	2.91	3.99	4.97
8	84600 - Diesel Maintenance per Customer	S.5.1 L.6 / L.1	59.60	69.49	52.98	70.79	67.09	72.18	69.41	64.94
9			<u>99.68</u>	<u>117.82</u>	<u>97.98</u>	<u>121.80</u>	<u>115.78</u>	<u>128.61</u>	<u>122.44</u>	<u>119.22</u>
10	Distribution per Customer									
11	87000 - Supervision per Customer	S.5.1 L.9 / L.1	16.43	16.31	17.82	16.81	19.00	17.35	19.43	19.97
12	87100 - Brushing per Customer	S.5.1 L.10 / L.1	24.54	23.33	15.63	23.82	25.54	24.32	24.19	24.74
13	87200 - Vehicle Depreciation per Customer	S.5.1 L.11 / L.1	(12.88)	(10.73)	(12.06)	(10.94)	(12.13)	(11.16)	(12.33)	(12.60)
14	87300 - Maintenance per Customer	S.5.1 L.12 / L.1	110.41	109.42	116.19	113.04	112.61	115.89	121.74	124.89
15	87310 - Service to Outside Parties per Customer	S.5.1 L.13 / L.1	6.73	6.03	6.28	6.15	8.03	6.27	7.01	7.17
16	87400 - Underground Line Maintenance per Customer	S.5.1 L.14 / L.1	9.14	9.46	6.50	9.75	8.35	9.94	8.79	9.07
17	87500 - Meter and Meter Testing per Customer	S.5.1 L.15 / L.1	11.06	5.05	5.50	5.21	5.33	5.38	5.47	5.64
18	87700 - Transformer Repair and Replacement per Customer	S.5.1 L.16 / L.1	4.37	4.33	2.73	4.50	2.43	4.60	3.10	3.17
19	87800 - Street Light Maintenance per Customer	S.5.1 L.17 / L.1	13.93	10.75	14.72	11.10	11.87	11.35	14.55	14.96
20			<u>183.74</u>	<u>173.96</u>	<u>173.31</u>	<u>179.45</u>	<u>181.01</u>	<u>183.94</u>	<u>191.94</u>	<u>197.00</u>
21	General per Customer									
22	88400 - Communication per Customer	S.5.1 L.20 / L.1	1.12	0.73	1.47	0.75	1.39	0.77	1.44	1.47
23	88800 - Maintenance Company-Owned Houses per Customer	S.5.1 L.21 / L.1	1.03	0.99	1.59	1.01	2.70	1.03	3.58	3.44
24	88900 - Maintenance Warehouse and Office per Customer	S.5.1 L.22 / L.1	8.29	7.54	9.47	7.69	8.47	7.85	9.45	9.66
25			<u>10.44</u>	<u>9.26</u>	<u>12.52</u>	<u>9.45</u>	<u>12.56</u>	<u>9.64</u>	<u>14.48</u>	<u>14.57</u>
26	Public Information per Customer									
27	70100 - Public Information Administration per Customer	S.5.1 L.25 / L.1	1.22	1.51	0.78	1.55	0.52	1.58	0.85	0.87
28	70200 - General Public Information per Customer	S.5.1 L.26 / L.1	7.10	6.85	9.85	7.03	6.31	7.22	7.21	8.30
29			<u>8.32</u>	<u>8.36</u>	<u>10.63</u>	<u>8.58</u>	<u>6.83</u>	<u>8.81</u>	<u>8.06</u>	<u>9.17</u>
30	Customer Accounting per Customer									
31	71000 - Supervision per Customer	S.5.1 L.29 / L.1	2.81	2.88	2.55	2.97	2.56	3.06	2.69	2.74
32	71100 - Customer Applications and Service Orders per Customer	S.5.1 L.30 / L.1	24.96	25.54	25.23	26.61	27.34	27.31	28.69	29.58
33	71200 - Meter Reading per Customer	S.5.1 L.31 / L.1	32.68	30.75	32.62	31.78	34.99	33.01	36.60	37.67
34	71300 - Customer Billing and Accounting per Customer	S.5.1 L.32 / L.1	42.14	42.29	45.21	43.84	35.05	45.27	36.01	36.82
35	71400 - Revenue Collections per Customer	S.5.1 L.33 / L.1	10.76	11.14	11.51	12.63	9.72	13.00	10.15	10.43
36	71500 - Collection of Delinquent Accounts per Customer	S.5.1 L.34 / L.1	7.94	7.12	7.60	7.78	7.32	8.01	7.58	7.80
37	71800 - Provision for Uncollectible Accounts per Customer	S.5.1 L.35 / L.1	4.41	2.10	6.98	2.10	3.79	2.10	5.06	5.17
38			<u>125.69</u>	<u>121.83</u>	<u>131.70</u>	<u>127.72</u>	<u>120.77</u>	<u>131.76</u>	<u>126.78</u>	<u>130.21</u>
39	Administration and General per Customer									
40	72100 - Administrative per Customer	S.5.1 L.38 / L.1	132.19	129.10	133.35	130.31	114.66	121.42	134.88	137.68
41	72200 - Administrative Corporate per Customer	S.5.1 L.39 / L.1	6.25	7.86	8.92	8.02	7.63	8.18	8.34	8.53
42	72300 - Insurance per Customer	S.5.1 L.40 / L.1	13.75	15.32	8.92	11.80	5.24	8.06	5.85	5.98
43	72400 - Injuries & Damages per Customer	S.5.1 L.41 / L.1	36.11	36.09	36.11	36.11	36.13	36.11	6.51	6.51
44	72500 - Employee Expenses per Customer	S.5.1 L.42 / L.1	15.97	15.79	21.25	16.11	17.47	16.49	19.70	20.01
45	72600 - Training and Safety per Customer	S.5.1 L.43 / L.1	26.28	25.56	27.37	26.35	27.13	27.11	29.46	30.31
46	72700 - Relocation per Customer	S.5.1 L.44 / L.1	14.07	9.28	9.88	9.47	25.33	9.65	21.40	21.42
47	72800 - Miscellaneous General per Customer	S.5.1 L.45 / L.1	0.29	0.02	-	0.02	-	0.02	0.10	0.10
48	72900 - Audit/Legal Fees & Special Studies per Customer	S.5.1 L.46 / L.1	11.84	7.71	11.49	9.04	8.14	8.04	10.74	10.94
49			<u>256.75</u>	<u>246.74</u>	<u>257.30</u>	<u>247.23</u>	<u>241.72</u>	<u>235.08</u>	<u>236.99</u>	<u>241.49</u>
50										
51	Total Operations and Maintenance Expenses per Customer		<u>684.62</u>	<u>677.98</u>	<u>683.44</u>	<u>694.22</u>	<u>678.67</u>	<u>697.84</u>	<u>700.69</u>	<u>711.68</u>

CW-YECL-14

Reference: YECL Application, page 5-2, Labour costs. Schedule 5.1

Issue/sub-issue: Operation and Maintenance

Preamble: CW requires information to assess forecast O&M costs.

Request:

- (a) Please provide a table similar to Schedule 5.1 that shows labour, benefits and non-labour separately.
- (b) Please provide a table similar to Schedule 5.1 that includes FTEs. In the response, please add a line at the bottom to include capital FTEs, and reconciles to total FTEs.
- (c) Please provide a table similar to Schedule 5.1 that includes cost per FTE.
- (d) Please fully explain the change in cost per FTE each year.

Response:

- (a) Please refer to CW-YECL-14 Attachment 1.
- (b) AEY does not track employee complement by function. Employees code their timesheets to the activities they have been working on in each time period, which allocates their costs to the appropriate function and/or capital project. Providing the employee complement by function is a significantly onerous and time consuming task.
- (c) Please refer to CW-YECL-14 Attachment 2.
- (d) The cost per FTE changes due to increases or decreases experienced in O&M costs as explained in schedule 5.2. Additionally, there are small changes in FTE complement due to vacancies and staffing changes from year to year.

ATCO Electric Yukon
Breakdown of Operations & Maintenance Expenses - Labour, Fringe & Other

			2013	2014	2015	Test Period	
			Actual	Actual	Actual	2016	2017
Production							
62600 - Hydro Generation	Labour		76	77	89	91	94
	Fringe		10	9	10	13	13
	Other		113	147	161	169	158
			199	233	261	273	265
64000 - Supervision and Engineering Diesel	Labour		50	53	55	57	59
	Fringe		12	10	11	13	13
	Other		2	1		2	2
			64	65	66	72	74
64600 - Diesel Generation	Labour		174	203	216	252	258
	Fringe		31	30	32	41	42
	Other		158	180	197	202	206
			364	413	445	494	506
82600 - Hydro Maintenance	Labour		29	27	26	32	33
	Fringe		4	5	5	6	6
	Other		27	28	31	31	46
			60	60	62	68	85
84600 - Diesel Maintenance	Labour		385	356	390	480	492
	Fringe		86	67	84	95	98
	Other		549	485	675	614	521
			1,020	907	1,148	1,188	1,111
Total Production			1,706	1,677	1,982	2,096	2,041

ATCO Electric Yukon
Breakdown of Operations & Maintenance Expenses - Labour, Fringe & Other

			2013	2014	2015	Test Period	
			Actual	Actual	Actual	2016	2017
Distribution							
87000 - Supervision	Labour		176	189	193	200	205
	Fringe		42	37	40	42	43
	Other		64	79	93	91	93
			281	305	325	333	342
87100 - Brushing	Labour		57	26	37	41	42
	Fringe		12	5	7	8	8
	Other		352	237	393	366	374
			420	268	437	414	423
87200 - Vehicle Depreciation	Other		(220)	(206)	(208)	(211)	(216)
			(220)	(206)	(208)	(211)	(216)
87300 - Maintenance	Labour		1,156	1,240	1,275	1,342	1,377
	Fringe		201	177	193	218	225
	Other		533	572	459	524	535
			1,890	1,989	1,927	2,084	2,138
87310 - Service to Outside Parties	Other		115	108	137	120	123
			115	108	137	120	123
87400 - Underground Line Maintenance	Labour		99	82	92	103	107
	Fringe		21	16	18	21	22
	Other		36	13	33	27	27
			156	111	143	150	155
87500 - Meter and Meter Testing	Labour		65	19	25	28	29
	Fringe		12	6	5	6	6
	Other		113	68	60	60	61
			189	94	91	94	97
87700 - Transformer Repair and Replacement	Labour		7	10	7	6	6
	Fringe		1	2	0	1	1
	Other		67	35	35	46	47
			75	47	42	53	54
87800 - Street Light Maintenance	Labour		80	97	88	97	100
	Fringe		17	18	18	19	20
	Other		142	136	97	133	136
			238	252	203	249	256
Total Distribution			3,145	2,966	3,098	3,285	3,372

ATCO Electric Yukon
Breakdown of Operations & Maintenance Expenses - Labour, Fringe & Other

			2013 Actual	2014 Actual	2015 Actual	Test Period 2016 2017	
General							
88400 - Communication	Labour		3	2	4	4	5
	Fringe		1	0	1	1	1
	Other		16	23	19	19	20
			19	25	24	25	25
88800 - Maintenance Company-Owned Houses	Labour			0	5	6	6
	Fringe			0	1	1	1
	Other		18	27	41	54	51
			18	27	46	61	59
88900 - Maintenance Warehouse and Office	Labour		4	5	10	10	10
	Fringe		1	1	2	2	2
	Other		137	156	133	150	153
			142	162	145	162	165
Total General			179	214	215	248	249
Public Information							
70100 - Public Information Administration	Labour		10	9	4	5	6
	Fringe		2	2	1	1	1
	Other		9	3	3	8	8
			21	13	9	15	15
70200 - General Public Information	Labour		59	74	68	70	72
	Fringe		14	14	13	15	15
	Other		48	80	27	38	55
			122	169	108	123	142
Total Public Information			142	182	117	138	157

ATCO Electric Yukon
Breakdown of Operations & Maintenance Expenses - Labour, Fringe & Other

			2013 Actual	2014 Actual	2015 Actual	Test Period 2016 2017	
Customer Accounting							
71000 - Supervision	Labour		38	35	36	38	38
	Fringe		10	8	8	8	9
			48	44	44	46	47
71100 - Customer Applications and Service Orders	Labour		307	312	343	359	371
	Fringe		72	60	73	77	80
	Other		49	60	52	55	56
			427	432	468	491	506
71200 - Meter Reading	Labour		325	355	381	396	408
	Fringe		77	54	81	87	90
	Other		158	150	137	144	148
			559	558	599	626	645
71300 - Customer Billing and Accounting	Labour		142	149	142	149	153
	Fringe		34	29	29	31	32
	Other		546	595	429	437	445
			721	774	600	616	630
71400 - Revenue Collections	Labour		146	163	136	142	145
	Fringe		35	32	28	29	30
	Other		3	2	2	3	3
			184	197	166	174	179
71500 - Collection of Delinquent Accounts	Labour		102	99	95	99	102
	Fringe		23	19	19	20	21
	Other		11	12	11	11	11
			136	130	125	130	134
71800 - Provision for Uncollectible Accounts	Other		75	120	65	87	89
			75	120	65	87	89
Total Customer Accounting			2,151	2,254	2,067	2,170	2,229

ATCO Electric Yukon
Breakdown of Operations & Maintenance Expenses - Labour, Fringe & Other

		2013 Actual	2014 Actual	2015 Actual	Test Period 2016 2017	
Admin & General						
72100 - Administrative	Labour	630	549	525	623	638
	Fringe	151	192	182	130	134
	Other	1,481	1,541	1,256	1,556	1,585
		2,263	2,282	1,963	2,309	2,357
72200 - Administrative Corporate	Other	107	153	131	143	146
		107	153	131	143	146
72300 - Insurance	Other	235	153	90	100	102
		235	153	90	100	102
72400 - Injuries & Damages	Other	618	618	618	112	112
		618	618	618	112	112
72500 - Employee Expenses	Labour	177	128	101	111	111
	Fringe	28	50	38	42	43
	Other	69	186	161	185	189
		273	364	299	337	343
72600 - Training and Safety	Labour	253	274	293	314	323
	Fringe	59	53	61	65	67
	Other	139	142	110	126	128
		450	469	464	504	519
72700 - Relocation	Labour	11	5	9	7	7
	Fringe	2	1	1	1	1
	Other	228	164	423	358	359
		241	169	434	366	367
72800 - Miscellaneous General	Other	5			2	2
		5			2	2
72900 - Audit/Legal Fees & Special Studies	Labour	36	51	33	35	35
	Fringe	8	10	8	8	8
	Other	159	136	98	141	144
		203	197	139	184	187
Total Admin & General		4,395	4,404	4,137	4,056	4,133
Grand Total Operations & Maintenance		11,718	11,698	11,616	11,993	12,181

The Yukon Electrical Company Limited
2016 - 2017 General Rate Application
Operations and Maintenance Expenses
(\$000 per FTE)

Line No.	Description	Cross Ref.	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Test Period 2016	Test Period 2017
1	FTE's		65.23	68.39	68.65	68.00	69.37	68.00	67.97	67.97
2										
3	Production per FTE									
4	62600 - Hydro Generation per FTE	S.5.1 L.2 / L.1	3.05	4.75	3.57	5.25	4.00	6.46	4.19	4.06
5	64000 - Supervision and Engineering Diesel per FTE	S.5.1 L.3 / L.1	0.98	0.92	0.99	0.95	1.01	0.98	1.10	1.13
6	64600 - Diesel Generation per FTE	S.5.1 L.4 / L.1	5.57	6.28	6.33	6.43	6.81	6.60	7.58	7.75
7	82600 - Hydro Maintenance per FTE	S.5.1 L.5 / L.1	0.91	0.73	0.91	0.75	0.95	0.76	1.05	1.30
8	84600 - Diesel Maintenance per FTE	S.5.1 L.6 / L.1	15.64	18.23	13.90	18.58	17.61	18.94	18.21	17.04
9			<u>26.16</u>	<u>30.92</u>	<u>25.71</u>	<u>31.96</u>	<u>30.38</u>	<u>33.75</u>	<u>32.13</u>	<u>31.28</u>
10	Distribution per FTE									
11	87000 - Supervision per FTE	S.5.1 L.9 / L.1	4.31	4.28	4.67	4.41	4.98	4.55	5.10	5.24
12	87100 - Brushing per FTE	S.5.1 L.10 / L.1	6.44	6.12	4.10	6.25	6.70	6.38	6.35	6.49
13	87200 - Vehicle Depreciation per FTE	S.5.1 L.11 / L.1	(3.38)	(2.81)	(3.16)	(2.87)	(3.18)	(2.93)	(3.23)	(3.31)
14	87300 - Maintenance per FTE	S.5.1 L.12 / L.1	28.97	28.71	30.49	29.66	29.55	30.41	31.94	32.77
15	87310 - Service to Outside Parties per FTE	S.5.1 L.13 / L.1	1.77	1.58	1.65	1.61	2.11	1.65	1.84	1.88
16	87400 - Underground Line Maintenance per FTE	S.5.1 L.14 / L.1	2.40	2.48	1.71	2.56	2.19	2.61	2.31	2.38
17	87500 - Meter and Meter Testing per FTE	S.5.1 L.15 / L.1	2.90	1.33	1.44	1.37	1.40	1.41	1.44	1.48
18	87700 - Transformer Repair and Replacement per FTE	S.5.1 L.16 / L.1	1.15	1.14	0.72	1.18	0.64	1.21	0.81	0.83
19	87800 - Street Light Maintenance per FTE	S.5.1 L.17 / L.1	3.66	2.82	3.86	2.91	3.11	2.98	3.82	3.93
20			<u>48.21</u>	<u>45.65</u>	<u>45.48</u>	<u>47.09</u>	<u>47.50</u>	<u>48.26</u>	<u>50.37</u>	<u>51.69</u>
21	General per FTE per FTE									
22	88400 - Communication per FTE	S.5.1 L.20 / L.1	0.29	0.19	0.39	0.20	0.37	0.20	0.38	0.39
23	88800 - Maintenance Company-Owned Houses per FTE	S.5.1 L.21 / L.1	0.27	0.26	0.42	0.26	0.71	0.27	0.94	0.90
24	88900 - Maintenance Warehouse and Office per FTE	S.5.1 L.22 / L.1	2.17	1.98	2.48	2.02	2.22	2.06	2.48	2.54
25			<u>2.74</u>	<u>2.43</u>	<u>3.29</u>	<u>2.48</u>	<u>3.30</u>	<u>2.53</u>	<u>3.80</u>	<u>3.82</u>
26	Public Information per FTE									
27	70100 - Public Information Administration per FTE	S.5.1 L.25 / L.1	0.32	0.40	0.21	0.41	0.14	0.42	0.22	0.23
28	70200 - General Public Information per FTE	S.5.1 L.26 / L.1	1.86	1.80	2.58	1.84	1.66	1.90	1.89	2.18
29			<u>2.18</u>	<u>2.19</u>	<u>2.79</u>	<u>2.25</u>	<u>1.79</u>	<u>2.31</u>	<u>2.11</u>	<u>2.41</u>
30	Customer Accounting per FTE									
31	71000 - Supervision per FTE	S.5.1 L.29 / L.1	0.74	0.76	0.67	0.78	0.67	0.80	0.71	0.72
32	71100 - Customer Applications and Service Orders per FTE	S.5.1 L.30 / L.1	6.55	6.70	6.62	6.98	7.17	7.16	7.53	7.76
33	71200 - Meter Reading per FTE	S.5.1 L.31 / L.1	8.57	8.07	8.56	8.34	9.18	8.66	9.60	9.88
34	71300 - Customer Billing and Accounting per FTE	S.5.1 L.32 / L.1	11.06	11.10	11.86	11.50	9.20	11.88	9.45	9.66
35	71400 - Revenue Collections per FTE	S.5.1 L.33 / L.1	2.82	2.92	3.02	3.31	2.55	3.41	2.66	2.74
36	71500 - Collection of Delinquent Accounts per FTE	S.5.1 L.34 / L.1	2.08	1.87	1.99	2.04	1.92	2.10	1.99	2.05
37	71800 - Provision for Uncollectible Accounts per FTE	S.5.1 L.35 / L.1	1.16	0.55	1.83	0.55	0.99	0.55	1.33	1.36
38			<u>32.98</u>	<u>31.97</u>	<u>34.56</u>	<u>33.51</u>	<u>31.69</u>	<u>34.57</u>	<u>33.27</u>	<u>34.17</u>
39	Administration and General per FTE									
40	72100 - Administrative per FTE	S.5.1 L.38 / L.1	34.69	33.88	34.99	34.19	30.09	31.86	35.39	36.13
41	72200 - Administrative Corporate per FTE	S.5.1 L.39 / L.1	1.64	2.06	2.34	2.10	2.00	2.15	2.19	2.24
42	72300 - Insurance per FTE	S.5.1 L.40 / L.1	3.61	4.02	2.34	3.10	1.37	2.11	1.53	1.57
43	72400 - Injuries & Damages per FTE	S.5.1 L.41 / L.1	9.47	9.47	9.47	9.47	9.48	9.47	1.71	1.71
44	72500 - Employee Expenses per FTE	S.5.1 L.42 / L.1	4.19	4.14	5.58	4.23	4.58	4.33	5.17	5.25
45	72600 - Training and Safety per FTE	S.5.1 L.43 / L.1	6.90	6.71	7.18	6.91	7.12	7.11	7.73	7.95
46	72700 - Relocation per FTE	S.5.1 L.44 / L.1	3.69	2.43	2.59	2.48	6.65	2.53	5.61	5.62
47	72800 - Miscellaneous General per FTE	S.5.1 L.45 / L.1	0.08	0.00	-	0.00	-	0.00	0.03	0.03
48	72900 - Audit/Legal Fees & Special Studies per FTE	S.5.1 L.46 / L.1	3.11	2.02	3.02	2.37	2.13	2.11	2.82	2.87
49			<u>67.37</u>	<u>64.74</u>	<u>67.51</u>	<u>64.87</u>	<u>63.43</u>	<u>61.68</u>	<u>62.18</u>	<u>63.37</u>
50										
51	Total Operations and Maintenance Expenses per FTE		<u>179.64</u>	<u>177.90</u>	<u>179.33</u>	<u>182.16</u>	<u>178.08</u>	<u>183.11</u>	<u>183.86</u>	<u>186.74</u>

CW-YECL-15

Reference: YECL Application, page 5-3

Issue/sub-issue: Operation and Maintenance

Preamble: On page 5-3, YECL discusses pension costs. YECL refers to the Alberta Pension filings. CW understands that, in Alberta, ATCO Utilities only recover 50% of special funding related to plan deficiencies. CW requires information to assess the requested funding

Request:

- (a) Please fully explain what costs YECL has included in its application for pension costs. In particular, please fully explain how YECL has treated special payment that would be disallowed in Alberta. Please include an analysis that clearly demonstrates total pension costs, and reconciles to the amounts that are included in this Application.
- (b) Please confirm that, in referring to the Alberta 2016 pension application, YECL will exclude any amounts that the AUC does not approve for inclusion in utility rates. Please fully explain the response.

Response:

- (a) In this Application, AEY included defined benefit pension costs for the 2016-2017 test periods consistent with the actual 2015 costs. As funding requirements of the defined benefit plan have decreased significantly since 2013, the placeholder for 2016 and 2017 is based on the 2015 actual levels. AEY has included COLA of 100% for the 2016-2017 test period subject to a decision being reached on the ATCO Utilities 2016 Pension Application.

For defined contribution AEY has included 6% of pensionable earnings for employees under the defined contribution plan.

Please refer to CW-YECL-15(a) Attachment 1 for pension costs included from 2013-2017 in the Application including amount to be refunded/collected from customers through the Pension Deferral approved as part of Decision 2014-06.

- (b) Confirmed.

**ATCO Electric Yukon
Pension Balances and Deferral Balances**

Line No.	Description	Cross Reference	2013 Actual	2014 Actual	2015 Actual	Test Period	
						2016	2017
1	Pension Costs						
2	Defined Benefit	Page 5-3	1,041	902	578	578	578
3	Exclude COLA		(354)	(467)	(113)	-	-
4	Defined Benefit Pension	S.8.4, Line 20	<u>687</u>	<u>435</u>	<u>465</u>	<u>578</u>	<u>578</u>
5	Defined Contribution	Page 5-3	209	242	267	276	286
6	Total Pension Costs		<u>896</u>	<u>677</u>	<u>732</u>	<u>854</u>	<u>864</u>
7	Approved/Applied Defined Benefit Costs		<u>687</u>	<u>602</u>	<u>602</u>	<u>578</u>	<u>578</u>
8	Difference	L.4 - L.7	<u>-</u>	<u>(167)</u>	<u>(137)</u>	<u>-</u>	<u>-</u>
9	O&M portion of Difference	(L.8 x 65.0%)	-	(109)	(89)	-	-
10	Impact of lower income tax deductions	(L.8 x 30.0%)	-	50	41	-	-
11	Net of Income Tax	L.9 + L.10	-	(59)	(48)	-	-
12	Total (refund to) / collection from customers	L.11 / (1 - 30.0%)	<u>-</u>	<u>(85)</u>	<u>(69)</u>	<u>-</u>	<u>-</u>
13	Cumulative Pension Deferral Balance*	S.8.8, Line 85	<u>-</u>	<u>(85)</u>	<u>(154)</u>	<u>(154)</u>	<u>(154)</u>

*AEY has proposed transferring the deferral balance to deferred charges to be refunded to customers over the 2016-2017 Test Period

CW-YECL-16

Reference: YECL Application, page 5-3

Issue/sub-issue: Operation and Maintenance

Preamble: CW requires information to assess affiliate costs. As AE Distribution in Alberta is under PBR, there is an incentive to allocate costs to other entities. As such, CW requires a detailed understanding of the cost allocation methodology and all changes in the methodology.

Request:

- (a) Please provide the working papers in support of the calculation of the “fully allocated cost methodology” referred to in the application. Please provide the analysis in excel format with formulae and links intact. Please provide the analysis for 2013-2015 actual results as well as 2016-2017 forecasts.
- (b) Please identify and fully explain all changes in methods, assumptions or calculations used to calculate affiliate costs in each of 2013, 2014, 2015, 2016, or proposed for 2017.

Response:

- (a) Costs allocated to AEY are labour costs, fringe costs and overhead costs for employees who have time allocated to AEY as well as flow through of system use charges. Please refer to the following table:

Head Office Affiliate Charges (\$000s)					
	2013	2014	2015	2016	2017
Labour	528	433	497	545	561
Fringe	127	104	124	131	135
Overhead	264	216	248	272	281
Flow Through	26	109	95	98	101
Total	945	862	964	1,046	1,078

The decrease in costs from 2013 to 2014 is mainly due to vacant head office positions. The increase from 2014 to 2015 is mainly due to the Customer Care and Billing services previously provided by ITEK Business Solutions now included in head office services. The increase from 2015 to 2016 is mainly due to the full year impact of filling previously vacant positions.

- (b) There has been no change to the methods, assumptions or calculations for affiliate costs.

CW-YECL-17

Reference: Schedule 5.2

Issue/sub-issue: Operation and Maintenance

Preamble: CW requires additional information to assess the forecast costs.

Request:

- (a) For Account 64600, YECL indicates the increase in 2016 is in part due to an addition of an engineering technologist position. Please fully explain why the position is required.
- (b) For account 84600, YECL indicates that 2014 is lower due to less top end maintenance than 2015. Please fully explain why a three year average of actual maintenance is not an appropriate base for forecast maintenance.
- (c) In account 87400, the explanation refers to account 87300, but there is no account 87300 in the schedule. Please provide account 87300 for Schedule 5.2.
- (d) For account 87800 please explain whether the forecasts include LED lighting or standard lighting.
- (e) For Account 88900, there is an unexplained decrease in 2015 followed by an increase in 2016. Please fully explain why costs decrease in 2015. Also fully explain why an average of three years actual results is not an appropriate forecast.
- (f) For Account 70200, please fully explain why customers should pay for the cost of changing the name of the company from Yukon Electrical Company Limited to ATCO Electric Yukon.
- (g) For account 72100 please fully explain why there is a need for an additional operational accountant.
- (h) For account 72100, please fully explain why an average of three years actual costs is not an acceptable forecast.
- (i) For account 72500, please fully explain why an average of three years actual costs is not an acceptable forecast.

- (j) For account 72700, please fully explain why an average of three years actual costs is not an acceptable forecast.

Response:

- (a) Please refer to Response YUB-YECL-3(a).
- (b) A three year average is not an appropriate base for forecast diesel maintenance due to the top end maintenance schedule. Top end maintenance is based on operating hours of the units. Due to the varying and nonlinear hours of operation of all AEY's units within a given year, an average is not an accurate forecasting methodology.
- (c) Please refer to the following table:

2013	2014	2015	Test Period	
Actual	Actual	Actual	2016	2017
1,890	1,989	1,927	2,084	2,138

Costs increase from 2013 to 2014 mainly due to inflation and lower vacancies.

Costs decrease from 2014 to 2015 mainly due to increased maintenance requirements for the underground system rather than overhead.

Costs increase from 2015 to 2016 mainly due to inflation, completing maintenance consistent with what was performed in 2013 and 2014.

Cost increase from 2016 to 2017 mainly due to inflation.

- (d) The forecasts are based on historical costs and inflation and do not include factors for LED lights. At this time, there are only a small number of LED lights in operation. Given current concerns with 250 watt HPS replacement lights, and the measured approach to replacement of 100 and 150 watt HPS lights, AEY has not forecast a material number of LED lights to be added in the next 1.5 years.
- (e) Please refer to Response YUB-YECL-42(a). A three year average was used for the specific costs that fluctuate year over year, inflation was applied to non-varying costs such as labour.
- (f) Please refer to Response JM-AEY-10.
- (g) An accountant is needed to assist with increasing regulatory and audit requirements and lead operational accountant functions such as forecast and

budget management. The operational accountant will also provide financial support for capital project leads and assist with accounting appropriately for new initiatives such as IPP and diesel displacement. The operational accountant will also assist with increasing internal and external audit requirements and ensure AEY remains compliant with the Internal Control Certification requirements.

This position is within the complement approved in Board Order 2014-06.

- (h) A three year average is not an acceptable forecast as there were accounting and administration employees on leave in 2015 and the addition of the operational accountant and Supervisor, Business Support Services. There are also additional costs for employee association negotiations forecast for 2016 and pension costs include COLA of 100% of CPI as compared to 50% included in 2013-2015.
- (i) The 2016 forecast is a 3 year average with an increase for known additional retirement and employee recognition costs over the prior three year period.
- (j) The 2016 forecast is a 3 year average with an adjustment for a higher vacancy rate used in the forecast that what has been experienced in the last two years. As AEY is assuming a higher vacancy rate it is also assuming that more relocations will be required to fill positions.

CW-YECL-18

Reference: YECL Application Schedule 5.3

Issue/sub-issue: Operation and Maintenance

Preamble: In accounts 72100 and 71300, YECL indicates that ATCO I-Tek and ITBS are no longer providing services.

Request:

- (a) Please indicate which entity is providing Information technology services. In the response, please indicate where in the application these costs are forecast, and provide an analysis of the amount of information technology costs for 2015, and forecast for 2016 and 2017.
- (b) Please confirm that the CC&B services provided by ATCO Electric are identical to that provided by ITBS. If not confirmed, please fully explain. If confirmed, please fully explain why the costs under ITBS are so much higher than that of AE, and why the ITBS costs should be considered prudent.

Response:

- (a) WIPRO Technologies is providing AEY's information technology services. Please refer to Response YUB-YECL-27 for the costs included in this application.
- (b) Not confirmed. ATCO Electric does not provide the IT services related to CIS nor do the charges from ATCO Electric include the postage for customer billing that was previously included in the ITBS charges.

CW-YECL-19

Reference: YECL Application, page 7-1

Issue/sub-issue: Depreciation

Preamble: In its Application, YECL states:

The depreciation rates used to calculate actual 2013 through 2015 and to forecast 2016-2017 depreciation expense were developed using the Board-approved depreciation parameters determined by the Depreciation Study conducted by Gannett Fleming and filed as part for 2013-2015 General Rate Application.

Request:

- (a) YECL states that the depreciation rates “were developed using the Board-approved depreciation parameters”. Please confirm that the actual depreciation rates are identical to those approved in the last General Rate Application. If not confirmed, please provide working papers that include the approved depreciation parameters, and how they were used in the calculation of depreciation rates. In the response, please provide a comparison of all parameters, comparing the amount included in this application to the amount include in the 2013-2015 application.

Response:

- (a) Consistent with past regulatory practice, AEY has completed a technical update in its current GRA after a full updated depreciation study was approved as part of its YECL 2013-2015 GRA. The annual technical update process is utilized by AEY to ensure that accurate depreciation rates are applied to its plant in service for each successive year.

AEY uses a Board approved Equal Life Group (ELG) procedure in its depreciation rate calculations. The distinguishing characteristic of the ELG procedure is decreasing vintage depreciation rates as a vintage ages. The most current vintage in a fixed asset account typically has the highest vintage depreciation rate. As the vintage ages, the vintage depreciation rate decreases. This decreasing characteristic applies to each separate vintage. Thus the changing investment mix of a fixed asset account from year to year due to additions, retirements, and adjustment will likely result in changing annual

composite depreciation rates (given unchanged depreciation life and net salvage parameters). As such, it is important to perform annual technical updates on a fixed asset account every year to ensure accurate depreciation rates

Please refer to CW-YECL-19 Attachment 1 the calculation of the depreciation rates used in the AEY 2016-2017 Application. These rates are not identical to the rates in the YECL 2013-2015 filing due to a changing investment mix however as shown in the attachment the approved depreciation parameters were used in calculation of the depreciation rates.

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

PROGRAM OPTIONS IN EFFECT:

CALCULATION MONTH AND YEAR	06-2016
CALCULATION PROCEDURE	1 = E.L.G.
MINIMUM EXPECTANCY	0.00
ADJUST FOR NET SALVAGE	YES

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 42200
HYDRO STRUCTURES

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
INTERIM SURVIVOR CURVE.. IOWA 72-R2					
PROBABLE RETIREMENT YEAR.. 12-2052					
NET SALVAGE PERCENT.. 0					
1971	5,331.19	1.41	75.17	.6345	3,383
1987	14,910.00	1.70	253.47	.4930	7,351
1989	17,378.39	1.75	304.12	.4725	8,211
1990	12,000.00-	1.78	213.60-	.4628	5,554-
1991	106.58	1.81	1.93	.4525	48
1994	12,000.00	1.89	226.80	.4158	4,990
2000	10,832.25	2.11	228.56	.3376	3,657
2010	21,239.34	2.63	558.59	.1578	3,352
2011	132,641.50	2.71	3,594.58	.1355	17,973
2012	15,637.71	2.79	436.29	.1116	1,745
2013	68,185.74	2.89	1,970.57	.0867	5,912
2014	1,902,802.47	3.00	57,084.07	.0600	114,168
TOTAL	2,189,065.17		64,520.55		165,236

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.95

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 42300
HYDRO RESV, DAMS & WATERWAYS

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
INTERIM SURVIVOR CURVE.. IOWA 103-R3					
PROBABLE RETIREMENT YEAR.. 12-2052					
NET SALVAGE PERCENT.. 0					
1987	454,475.11	1.57	7,135.26	.4553	206,923
1989	48,551.65	1.62	786.54	.4374	21,236
1992	2,414.61	1.70	41.05	.4080	985
1993	134,389.31	1.73	2,324.94	.3979	53,474
1996	24,178.48	1.82	440.05	.3640	8,801
1997	36,567.29	1.85	676.49	.3515	12,853
2002	11,519.73	2.03	233.85	.2842	3,274
2003	2,788.31	2.07	57.72	.2691	750
2004	42,198.95	2.11	890.40	.2532	10,685
2005	111,863.49	2.15	2,405.07	.2365	26,456
2007	98,112.46	2.25	2,207.53	.2025	19,868
2008	39,046.90	2.30	898.08	.1840	7,185
2010	781,176.00	2.40	18,748.22	.1440	112,489
2011	330,357.65	2.46	8,126.80	.1230	40,634
2012	606,582.21	2.52	15,285.87	.1008	61,143
2013	41,937.80	2.59	1,086.19	.0777	3,259
2014	2,332,672.56	2.66	62,049.09	.0532	124,098
2015	20,420.60	2.74	559.52	.0274	560
TOTAL	5,119,253.11		123,952.67		714,673

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.42

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 42500
HYDRO GENERATORS

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE	ACCRUAL-- AMOUNT (3)	-ACCRUED DEPREC.- FACTOR (4)	AMOUNT (5)	(6)
INTERIM SURVIVOR CURVE.. IOWA 85-R3						
PROBABLE RETIREMENT YEAR.. 12-2052						
NET SALVAGE PERCENT.. 0						
1987	99,393.45	1.61	1,600.23	.4669	46,407	
2000	89,392.44	1.98	1,769.97	.3168	28,320	
2009	124,172.24	2.38	2,955.30	.1666	20,687	
2010	463,321.15	2.43	11,258.70	.1458	67,552	
2011	19,166.87	2.49	477.26	.1245	2,386	
2012	2,100,333.60		2.55 53,558.51	.1020		214,234
2013	140,558.04	2.62	3,682.62	.0786	11,048	
2015	21,819.91	2.77	604.41	.0277	604	
TOTAL	3,058,157.70		75,907.00			391,238

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.48

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 42600
HYDRO ACCESSORY ELECTRIC EQUIP

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
INTERIM SURVIVOR CURVE.. IOWA 45-R3					
PROBABLE RETIREMENT YEAR.. 12-2052					
NET SALVAGE PERCENT.. 0					
1987	27,185.00	2.17	589.91	.6293	17,108
1991	12,366.51	2.24	277.01	.5600	6,925
1998	28,793.83	2.38	685.29	.4284	12,335
2000	12,896.50	2.42	312.10	.3872	4,994
TOTAL	81,241.84		1,864.31		41,362

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.29

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 42700
HYDRO MISC EQUIP

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
INTERIM SURVIVOR CURVE.. IOWA 30-R2					
PROBABLE RETIREMENT YEAR.. 12-2052					
NET SALVAGE PERCENT.. 0					
1987	800.00	2.71	21.68	.7859	629
2008	3,364.92	3.74	125.85	.2992	1,007
2012	36,542.79	4.08	1,490.95	.1632	5,964
2015	27,378.97	4.65	1,273.12	.0465	1,273
TOTAL	68,086.68		2,911.60		8,873

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 4.28

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44200
STRUCTURES AND IMPROVEMENTS - DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R2.5					
NET SALVAGE PERCENT.. 0					
1971	153,295.53	1.92	2,943.27	.8640	132,447
1974	8,707.10	2.00	174.14	.8400	7,314
1976	15,576.34	2.05	319.31	.8200	12,773
1978	170.40	2.10	3.58	.7980	136
1982	55,338.07	2.20	1,217.44	.7480	41,393
1983	42,062.15	2.23	937.99	.7359	30,954
1985	13,952.01	2.27	316.71	.7037	9,818
1986	22,121.90	2.30	508.80	.6900	15,264
1987	311,360.32	2.32	7,223.56	.6728	209,483
1988	39,385.22	2.34	921.61	.6552	25,805
1989	29,819.59	2.37	706.72	.6399	19,082
1991	1,409.87	2.41	33.98	.6025	849
1992	10,141.91	2.44	247.46	.5856	5,939
1993	59,158.97	2.46	1,455.31	.5658	33,472
1996	8,908.07	2.53	225.37	.5060	4,507
1997	53,204.86	2.55	1,356.72	.4845	25,778
1998	54,144.48	2.58	1,396.93	.4644	25,145
1999	29,783.20	2.60	774.36	.4420	13,164
2001	186.47	2.65	4.94	.3975	74
2004	1,001.91	2.72	27.25	.3264	327
2005	243,013.04	2.75	6,682.86	.3025	73,511
2006	221,326.80	2.78	6,152.89	.2780	61,529
2007	181,455.77	2.80	5,080.76	.2520	45,727
2008	322,680.35	2.83	9,131.85	.2264	73,055
2009	25,330.54	2.86	724.45	.2002	5,071
2010	30,304.59	2.90	878.83	.1740	5,273
2011	28,306.73	2.93	829.39	.1465	4,147
2012	258,315.67	2.97	7,671.98	.1188	30,688
2013	176,150.60	3.02	5,319.75	.0906	15,959
2014	3,260,121.62	3.09	100,737.76	.0618	201,476
TOTAL	5,656,734.08		164,005.97		1,130,160

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.90

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44400
FUEL HOLDERS, PRODUCTS AND ACC.- DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 35-R4 NET SALVAGE PERCENT.. 0					
1971	3,005.24	2.14	64.31	.9630	2,894
1973	5,061.79	2.21	111.87	.9503	4,810
1976	8,400.29	2.32	194.89	.9280	7,795
1978	989.00	2.40	23.74	.9120	902
1982	52,075.44	2.55	1,327.92	.8670	45,149
1985	1.00	2.64	0.03	.8184	1
1986	7,089.08	2.67	189.28	.8010	5,678
1987	20,835.31	2.70	562.55	.7830	16,314
1988	86,979.73	2.72	2,365.85	.7616	66,244
1989	9,936.21	2.75	273.25	.7425	7,378
1990	14,133.96	2.77	391.51	.7202	10,179
1993	126,332.65	2.84	3,587.85	.6532	82,520
1994	92,190.19	2.87	2,645.86	.6314	58,209
1996	5,470.27	2.90	158.64	.5800	3,173
1997	12,926.06	2.92	377.44	.5548	7,171
1998	212,029.62	2.93	6,212.47	.5274	111,824
1999	179,776.07	2.95	5,303.39	.5015	90,158
2003	358,039.89	2.99	10,705.39	.3887	139,170
2004	842,591.93	3.00	25,277.76	.3600	303,333
2005	685,038.50	3.00	20,551.16	.3300	226,063
2006	100,239.51	3.01	3,017.21	.3010	30,172
2007	25,562.13	3.01	769.42	.2709	6,925
2008	27,179.87	3.02	820.83	.2416	6,567
2009	152,591.16	3.02	4,608.25	.2114	32,258
2012	109,665.17	3.03	3,322.85	.1212	13,291
TOTAL	3,138,140.07		92,863.72		1,278,178

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.96

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44500
GENERATING EQUIPMENT AND PRIME MOVERS DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 26-S2.5 NET SALVAGE PERCENT.. 0					
1970	13,109.71	2.13	279.24	.9798	12,845
1971	13,109.71-	2.17	284.48-	.9765	12,802-
1972	1,878.92	2.20	41.34	.9680	1,819
1973	11,388.97	2.24	255.11	.9632	10,970
1974	13,894.16	2.29	318.18	.9618	13,363
1975	3,539.81-	2.33	82.48-	.9553	3,382-
1977	11,347.10	2.42	274.60	.9438	10,709
1981	9,768.58	2.63	256.91	.9205	8,992
1982	22,524.25	2.68	603.65	.9112	20,524
1983	32,360.52	2.74	886.68	.9042	29,260
1984	6,948.44	2.80	194.56	.8960	6,226
1985	77,451.39	2.86	2,215.11	.8866	68,668
1986	52,900.59	2.93	1,549.99	.8790	46,500
1987	155.25	2.99	4.64	.8671	135
1988	68,773.17	3.06	2,104.46	.8568	58,925
1989	246,298.62	3.12	7,684.52	.8424	207,482
1990	155,349.50	3.19	4,955.65	.8294	128,847
1991	1,222,143.44	3.26	39,841.88	.8150	996,047
1992	95,238.22	3.33	3,171.43	.7992	76,114
1993	1,102,745.73	3.40	37,493.35	.7820	862,347
1994	192,607.71	3.47	6,683.49	.7634	147,037
1996	307,541.93	3.61	11,102.26	.7220	222,045
1997	647,226.02	3.68	23,817.92	.6992	452,540
1998	345,251.28	3.75	12,946.92	.6750	233,045
1999	434,108.41	3.81	16,539.53	.6477	281,172
2000	33,218.56	3.87	1,285.56	.6192	20,569
2002	6,723.20	3.98	267.58	.5572	3,746
2003	8,866.35	4.03	357.31	.5239	4,645
2004	93,051.26	4.07	3,787.19	.4884	45,446
2009	58,488.49	4.21	2,462.37	.2947	17,237
2010	151,030.51	4.22	6,373.49	.2532	38,241
2011	467,030.72	4.23	19,755.40	.2115	98,777
2012	385,117.68	4.24	16,328.99	.1696	65,316
2013	2,723,806.22	4.24	115,489.38	.1272	346,468
2014	2,937,429.23	4.25	124,840.74	.0850	249,681
2015	452,556.83	4.25	19,233.67	.0425	19,234
TOTAL	12,371,681.44		483,036.14		4,788,788

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 3.90

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44600
ACCESSORY ELECTRIC EQUIPMENT - DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 35-R3					
NET SALVAGE PERCENT.. 0					
1970	1,791.00-	2.04	36.54-	.9384	1,681-
1971	69,595.93	2.07	1,440.64	.9315	64,829
1972	16,760.24	2.10	351.97	.9240	15,486
1973	14,978.26	2.13	319.04	.9159	13,719
1974	698.38	2.17	15.15	.9114	637
1976	3,460.07	2.24	77.51	.8960	3,100
1977	966.41	2.27	21.94	.8853	856
1981	4,382.96	2.41	105.63	.8435	3,697
1982	26,720.48	2.44	651.98	.8296	22,167
1983	5,928.99	2.47	146.45	.8151	4,833
1984	9,095.34	2.51	228.29	.8032	7,305
1985	1,408.73	2.54	35.78	.7874	1,109
1986	30,100.56	2.57	773.58	.7710	23,208
1987	220,208.40	2.60	5,725.42	.7540	166,037
1989	100,058.64	2.66	2,661.56	.7182	71,862
1990	121,839.18	2.69	3,277.47	.6994	85,214
1991	14,955.00	2.72	406.78	.6800	10,169
1992	22,037.80	2.75	606.04	.6600	14,545
1993	85,637.85	2.78	2,380.73	.6394	54,757
1994	9,356.98	2.80	262.00	.6160	5,764
1997	126,077.88	2.88	3,631.04	.5472	68,990
1998	66,267.62	2.91	1,928.39	.5238	34,711
1999	163,692.44	2.93	4,796.19	.4981	81,535
2000	178,760.24	2.96	5,291.30	.4736	84,661
2001	187,978.07	2.98	5,601.75	.4470	84,026
2002	30,735.63	3.01	925.14	.4214	12,952
2003	4,882.85-	3.03	147.95-	.3939	1,923-
2004	7,833.49	3.05	238.92	.3660	2,867
2005	4,960.69	3.07	152.29	.3377	1,675
2006	20,447.09	3.10	633.86	.3100	6,339
2007	60,561.92	3.12	1,889.53	.2808	17,006
2008	192,279.65	3.14	6,037.58	.2512	48,301
2009	8,766.27	3.16	277.01	.2212	1,939
2010	3,223.43	3.18	102.51	.1908	615
2011	52,856.96	3.20	1,691.42	.1600	8,457
2012	247,936.82	3.22	7,983.57	.1288	31,934
2013	668,868.08	3.25	21,738.21	.0975	65,215

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44600
ACCESSORY ELECTRIC EQUIPMENT - DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 35-R3					
NET SALVAGE PERCENT.. 0					
2014	452,457.89	3.28	14,840.62	.0656	29,681
2015	1,126,315.11	3.32	37,393.66	.0332	37,394
TOTAL	4,351,535.63		134,456.46		1,183,988

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 3.09

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 44700
MISCELLANEOUS POWER PLANT EQUIPMENT - DIESEL PRODUCTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R3 NET SALVAGE PERCENT.. 0					
1971	3,380.71	1.97	66.60	.8865	2,997
1979	4,179.21	2.18	91.11	.8066	3,371
1982	22,303.41	2.26	504.06	.7684	17,138
1987	14,434.04	2.37	342.09	.6873	9,921
1991	34,034.46	2.46	837.25	.6150	20,931
1992	92,241.67	2.48	2,287.59	.5952	54,902
1993	198.09	2.50	4.95	.5750	114
1996	76.70	2.56	1.96	.5120	39
1998	27,448.30	2.59	710.91	.4662	12,796
1999	8,046.80	2.61	210.02	.4437	3,570
2000	1,450.00	2.63	38.14	.4208	610
2003	1,376.20	2.68	36.88	.3484	479
2004	1,395.10	2.70	37.67	.3240	452
2005	18,356.25	2.72	499.29	.2992	5,492
2006	35,493.53	2.73	968.97	.2730	9,690
2007	267,727.95	2.75	7,362.52	.2475	66,263
2008	26,941.49	2.76	743.59	.2208	5,949
2009	37,878.94	2.78	1,053.03	.1946	7,371
2010	8,942.89	2.80	250.40	.1680	1,502
2011	105,116.94	2.81	2,953.79	.1405	14,769
2012	37,412.71	2.83	1,058.78	.1132	4,235
2013	148,651.50	2.85	4,236.57	.0855	12,710
2014	1,029.00	2.87	29.53	.0574	59
2015	437,366.16	2.91	12,727.36	.0291	12,727
TOTAL	1,332,729.65		36,979.30		267,129

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.77

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 45700
SUBSTATION EQUIPMENT - TRANSMISSION PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 50-R4					
NET SALVAGE PERCENT.. 0					
1957	8,481.84	1.59	134.86	.9381	7,957
1960	3,229.85	1.65	53.29	.9240	2,984
1961	657.80	1.66	10.92	.9130	601
1963	1,015.95	1.70	17.27	.9010	915
1964	213.85	1.72	3.68	.8944	191
1965	410.15	1.74	7.14	.8874	364
1966	62.60	1.76	1.10	.8800	55
1967	5,878.36	1.77	104.05	.8673	5,098
1968	14,018.01	1.79	250.92	.8592	12,044
1969	25,261.00	1.81	457.22	.8507	21,490
1970	17,772.00	1.82	323.45	.8372	14,879
1971	3,930.00	1.84	72.31	.8280	3,254
1974	41,250.75	1.88	775.51	.7896	32,572
1975	1,183.87	1.89	22.38	.7749	917
1981	4,153.38	1.97	81.82	.6895	2,864
1982	3,210.00	1.98	63.56	.6732	2,161
1984	9,590.00	2.00	191.80	.6400	6,138
1985	14,603.26	2.01	293.53	.6231	9,099
1986	43,015.79	2.02	868.92	.6060	26,068
1988	21,596.39	2.04	440.57	.5712	12,336
1989	18,476.14	2.04	376.91	.5508	10,177
1992	231,307.73	2.07	4,788.07	.4968	114,914
1993	460,428.37	2.07	9,530.87	.4761	219,210
1996	147,978.24	2.09	3,092.75	.4180	61,855
1997	442.56	2.09	9.25	.3971	176
1999	62,040.09	2.10	1,302.84	.3570	22,148
2000	4,081.39	2.10	85.71	.3360	1,371
TOTAL	1,144,289.37		23,360.70		591,838

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.04

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47100
LAND RIGHTS - DISTRIBUTION SYSTEM

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 75-R3					
NET SALVAGE PERCENT.. 0					
1971	1,500.00	1.32	19.80	.5940	891
1979	198.05	1.37	2.71	.5069	100
1994	12,700.80	1.44	182.89	.3168	4,024
1995	44,975.18	1.45	652.14	.3045	13,695
1996	46,085.52	1.45	668.24	.2900	13,365
1997	140,113.75	1.46	2,045.66	.2774	38,868
1998	50,522.14	1.46	737.62	.2628	13,277
1999	50,004.19	1.47	735.06	.2499	12,496
2000	49,670.66	1.47	730.16	.2352	11,683
2001	55,348.17	1.47	813.62	.2205	12,204
2002	34,647.85	1.48	512.79	.2072	7,179
2003	61,972.64	1.48	917.20	.1924	11,924
2004	60,926.26	1.49	907.80	.1788	10,894
2005	204,085.51	1.49	3,040.87	.1639	33,450
2006	46,254.29	1.50	693.81	.1500	6,938
2007	69,728.37	1.50	1,045.93	.1350	9,413
2008	103,657.56	1.51	1,565.23	.1208	12,522
2009	72,924.99	1.51	1,101.17	.1057	7,708
2010	86,743.57	1.52	1,318.50	.0912	7,911
2011	75,648.81	1.52	1,149.86	.0760	5,749
2012	62,943.96	1.53	963.04	.0612	3,852
2013	50,400.79	1.54	776.17	.0462	2,329
2014	69,137.10	1.55	1,071.63	.0310	2,143
2015	128,628.27	1.57	2,019.46	.0157	2,019
TOTAL	1,578,818.43		23,671.36		244,634

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 1.50

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47300
POLES & FIXTURES - DISTRIBUTION SYSTEM

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3					
NET SALVAGE PERCENT.. 0					
1958	3,014.82	1.60	48.24	.9280	2,798
1959	3,422.64	1.62	55.45	.9234	3,160
1960	59,185.33	1.64	970.64	.9184	54,356
1961	21,431.90	1.66	355.77	.9130	19,567
1962	17,904.69	1.68	300.80	.9072	16,243
1963	22,471.81	1.71	384.27	.9063	20,366
1964	25,528.25	1.73	441.64	.8996	22,965
1965	21,327.34	1.75	373.23	.8925	19,035
1966	70,219.67	1.77	1,242.89	.8850	62,144
1967	34,353.48	1.79	614.93	.8771	30,131
1968	82,412.60	1.81	1,491.67	.8688	71,600
1969	102,735.80	1.83	1,880.07	.8601	88,363
1970	10,387.53	1.85	192.17	.8510	8,840
1971	16,307.10	1.87	304.94	.8415	13,722
1972	120,899.56	1.89	2,285.00	.8316	100,540
1973	88,411.37	1.91	1,688.66	.8213	72,612
1974	84,484.29	1.93	1,630.55	.8106	68,483
1975	140,464.31	1.95	2,739.05	.7995	112,301
1976	95,053.78	1.97	1,872.56	.7880	74,902
1977	229,569.81	1.99	4,568.44	.7761	178,169
1978	204,295.31	2.01	4,106.34	.7638	156,041
1979	196,316.62	2.03	3,985.23	.7511	147,453
1980	100,346.08	2.05	2,057.09	.7380	74,055
1981	114,266.09	2.06	2,353.88	.7210	82,386
1982	351,015.52	2.08	7,301.12	.7072	248,238
1983	134,288.69	2.10	2,820.06	.6930	93,062
1984	266,843.53	2.12	5,657.08	.6784	181,027
1985	747,123.54	2.13	15,913.73	.6603	493,326
1986	264,992.30	2.15	5,697.33	.6450	170,920
1987	414,752.08	2.17	9,000.12	.6293	261,003
1988	328,822.96	2.18	7,168.34	.6104	200,714
1989	573,768.94	2.20	12,622.92	.5940	340,819
1990	1,106,097.11	2.22	24,555.36	.5772	638,439
1991	775,025.56	2.23	17,283.07	.5575	432,077
1992	1,157,173.65	2.25	26,036.41	.5400	624,874
1993	1,573,820.86	2.26	35,568.35	.5198	818,072
1994	986,288.27	2.28	22,487.37	.5016	494,722

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47300
POLES & FIXTURES - DISTRIBUTION SYSTEM

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3					
NET SALVAGE PERCENT.. 0					
1995	899,012.05	2.29	20,587.38	.4809	432,335
1996	899,513.01	2.31	20,778.75	.4620	415,575
1997	764,763.70	2.32	17,742.52	.4408	337,108
1998	675,183.24	2.34	15,799.29	.4212	284,387
1999	763,388.42	2.35	17,939.63	.3995	304,974
2000	600,617.04	2.37	14,234.62	.3792	227,754
2001	631,514.49	2.38	15,030.04	.3570	225,451
2002	984,791.90	2.39	23,536.53	.3346	329,511
2003	773,449.83	2.41	18,640.14	.3133	242,322
2004	1,280,994.37	2.42	31,000.06	.2904	372,001
2005	968,511.28	2.43	23,534.82	.2673	258,883
2006	1,350,281.13	2.44	32,946.86	.2440	329,469
2007	1,085,556.89	2.46	26,704.70	.2214	240,342
2008	1,615,467.66	2.47	39,902.05	.1976	319,216
2009	1,485,370.15	2.48	36,837.18	.1736	257,860
2010	1,872,795.77	2.50	46,819.89	.1500	280,919
2011	3,224,737.86	2.51	80,940.92	.1255	404,705
2012	3,899,545.34	2.52	98,268.54	.1008	393,074
2013	2,683,257.27	2.54	68,154.73	.0762	204,464
2014	2,807,654.38	2.56	71,875.95	.0512	143,752
2015	1,511,485.85	2.59	39,147.48	.0259	39,147
TOTAL	41,322,714.82		988,476.85		12,540,774

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.39

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47400
OVERHEAD CONDUCTORS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R4					
NET SALVAGE PERCENT.. 0					
1948	32.58	1.47	0.48	.9996	33
1949	112.48	1.49	1.68	.9983	112
1950	15.81	1.51	0.24	.9966	16
1951	139.38	1.52	2.12	.9880	138
1952	206.23	1.54	3.18	.9856	203
1953	1,551.08	1.56	24.20	.9828	1,524
1954	2,638.00	1.58	41.68	.9796	2,584
1955	418.31	1.60	6.69	.9760	408
1956	2,743.00	1.62	44.44	.9720	2,666
1957	922.06	1.64	15.12	.9676	892
1958	5,559.00	1.66	92.28	.9628	5,352
1959	8,040.00	1.68	135.07	.9576	7,699
1960	72,321.01	1.70	1,229.46	.9520	68,850
1961	9,293.00	1.72	159.84	.9460	8,791
1962	12,100.41	1.74	210.55	.9396	11,370
1963	14,243.14	1.77	252.10	.9381	13,361
1964	10,540.74	1.79	188.68	.9308	9,811
1965	14,565.83	1.81	263.64	.9231	13,446
1966	43,767.33	1.84	805.32	.9200	40,266
1967	35,880.76	1.86	667.38	.9114	32,702
1968	65,328.08	1.88	1,228.17	.9024	58,952
1969	124,098.03	1.91	2,370.27	.8977	111,403
1970	25,550.60	1.93	493.13	.8878	22,684
1971	18,655.91	1.95	363.79	.8775	16,371
1972	109,646.05	1.97	2,160.03	.8668	95,041
1973	86,940.28	1.99	1,730.11	.8557	74,395
1974	56,798.46	2.01	1,141.65	.8442	47,949
1975	144,638.16	2.03	2,936.15	.8323	120,382
1976	106,854.96	2.05	2,190.53	.8200	87,621
1977	145,005.78	2.07	3,001.62	.8073	117,063
1978	91,425.93	2.09	1,910.80	.7942	72,610
1979	76,878.47	2.10	1,614.45	.7770	59,735
1980	122,191.66	2.12	2,590.46	.7632	93,257
1981	87,516.47	2.13	1,864.10	.7455	65,244
1982	209,885.33	2.15	4,512.53	.7310	153,426
1983	132,046.38	2.16	2,852.20	.7128	94,123
1984	121,803.29	2.18	2,655.31	.6976	84,970

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47400
OVERHEAD CONDUCTORS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R4 NET SALVAGE PERCENT.. 0					
1985	677,899.61	2.19	14,846.00	.6789	460,226
1986	134,113.44	2.21	2,963.91	.6630	88,917
1987	328,209.90	2.22	7,286.26	.6438	211,302
1988	239,184.34	2.23	5,333.81	.6244	149,347
1989	332,588.42	2.24	7,449.98	.6048	201,149
1990	680,441.85	2.25	15,309.94	.5850	398,058
1991	519,630.93	2.26	11,743.66	.5650	293,591
1992	485,961.65	2.27	11,031.33	.5448	264,752
1993	792,959.72	2.28	18,079.48	.5244	415,828
1994	463,654.51	2.29	10,617.69	.5038	233,589
1995	357,845.36	2.30	8,230.44	.4830	172,839
1996	560,475.87	2.31	12,946.99	.4620	258,940
1997	521,699.29	2.31	12,051.25	.4389	228,974
1998	410,007.42	2.32	9,512.17	.4176	171,219
1999	410,555.25	2.32	9,524.88	.3944	161,923
2000	478,859.56	2.33	11,157.43	.3728	178,519
2001	464,383.66	2.33	10,820.14	.3495	162,302
2002	511,085.75	2.34	11,959.41	.3276	167,432
2003	423,598.69	2.34	9,912.21	.3042	128,859
2004	147,517.61	2.34	3,451.91	.2808	41,423
2005	793,470.21	2.35	18,646.55	.2585	205,112
2006	1,160,619.99	2.35	27,274.57	.2350	272,746
2007	1,580,234.03	2.35	37,135.50	.2115	334,219
2008	1,517,742.62	2.35	35,666.95	.1880	285,336
2009	942,854.79	2.35	22,157.09	.1645	155,100
2010	1,360,397.78	2.36	32,105.39	.1416	192,632
2011	1,556,126.35	2.36	36,724.58	.1180	183,623
2012	1,719,885.04	2.36	40,589.29	.0944	162,357
2013	1,411,292.39	2.36	33,306.50	.0708	99,920
2014	1,676,463.74	2.36	39,564.54	.0472	79,129
2015	906,973.48	2.36	21,404.57	.0236	21,405
TOTAL	25,527,087.24		588,563.87		7,976,218

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.31

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47410
OVERHEAD SERVICES - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3 NET SALVAGE PERCENT.. 0					
1945	1,929.05	1.39	26.81	.9869	1,904
1946	414.58	1.40	5.80	.9800	406
1947	476.35	1.42	6.76	.9798	467
1948	569.49	1.43	8.14	.9724	554
1949	673.48	1.45	9.77	.9715	654
1950	808.02	1.46	11.80	.9636	779
1951	900.65	1.48	13.33	.9620	866
1952	1,366.00	1.50	20.49	.9600	1,311
1953	2,459.00	1.51	37.13	.9513	2,339
1954	3,197.00	1.53	48.91	.9486	3,033
1955	2,771.00	1.55	42.95	.9455	2,620
1956	3,325.00	1.57	52.20	.9420	3,132
1957	3,592.00	1.59	57.11	.9381	3,370
1958	1,170.00	1.60	18.72	.9280	1,086
1959	1,533.00	1.62	24.83	.9234	1,416
1960	1,560.00	1.64	25.58	.9184	1,433
1961	1,791.78	1.66	29.74	.9130	1,636
1962	5,328.00	1.68	89.51	.9072	4,834
1963	2,524.00	1.71	43.16	.9063	2,288
1964	4,560.00	1.73	78.89	.8996	4,102
1965	3,229.00	1.75	56.51	.8925	2,882
1966	4,597.36	1.77	81.37	.8850	4,069
1967	7,481.00	1.79	133.91	.8771	6,562
1968	8,000.00	1.81	144.80	.8688	6,950
1969	7,521.50	1.83	137.64	.8601	6,469
1970	11,754.13	1.85	217.45	.8510	10,003
1971	12,073.93	1.87	225.78	.8415	10,160
1972	12,957.01	1.89	244.89	.8316	10,775
1973	14,692.86	1.91	280.63	.8213	12,067
1974	19,809.43	1.93	382.32	.8106	16,058
1975	34,619.23	1.95	675.07	.7995	27,678
1976	37,678.27	1.97	742.26	.7880	29,690
1977	41,941.77	1.99	834.64	.7761	32,551
1978	62,182.03	2.01	1,249.86	.7638	47,495
1979	52,049.79	2.03	1,056.61	.7511	39,095
1980	43,273.51	2.05	887.11	.7380	31,936
1981	52,863.10	2.06	1,088.98	.7210	38,114

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47410
OVERHEAD SERVICES - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3					
NET SALVAGE PERCENT.. 0					
1982	30,980.05	2.08	644.39	.7072	21,909
1983	40,503.38	2.10	850.57	.6930	28,069
1984	39,884.43	2.12	845.55	.6784	27,058
1985	32,685.06	2.13	696.19	.6603	21,582
1986	51,608.88	2.15	1,109.59	.6450	33,288
1987	67,879.82	2.17	1,472.99	.6293	42,717
1988	66,242.11	2.18	1,444.08	.6104	40,434
1989	81,267.48	2.20	1,787.88	.5940	48,273
1990	89,672.48	2.22	1,990.73	.5772	51,759
1991	108,151.36	2.23	2,411.78	.5575	60,294
1992	163,702.21	2.25	3,683.30	.5400	88,399
1993	111,858.15	2.26	2,527.99	.5198	58,144
1994	64,781.32	2.28	1,477.01	.5016	32,494
1995	54,851.29	2.29	1,256.09	.4809	26,378
1997	45,912.56	2.32	1,065.17	.4408	20,238
1998	46,874.69	2.34	1,096.87	.4212	19,744
1999	40,391.91	2.35	949.21	.3995	16,137
2000	33,672.14	2.37	798.03	.3792	12,768
2001	25,583.05	2.38	608.88	.3570	9,133
2002	59,316.63	2.39	1,417.67	.3346	19,847
2003	55,673.16	2.41	1,341.72	.3133	17,442
2004	67,928.56	2.42	1,643.87	.2904	19,726
2005	63,429.49	2.43	1,541.34	.2673	16,955
2006	162,508.67	2.44	3,965.21	.2440	39,652
2007	191,540.77	2.46	4,711.90	.2214	42,407
2008	225,262.76	2.47	5,563.99	.1976	44,512
2009	129,908.59	2.48	3,221.73	.1736	22,552
2010	31,681.39	2.50	792.03	.1500	4,752
2011	221,420.88	2.51	5,557.66	.1255	27,788
2012	137,468.98	2.52	3,464.22	.1008	13,857
2013	119,761.14	2.54	3,041.93	.0762	9,126
2014	18,540.78	2.56	474.64	.0512	949
2015	20,049.66	2.59	519.29	.0259	519
TOTAL	3,168,666.15		73,064.96		1,309,686

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.31

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47500
UNDERGROUND CONDUIT - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3 NET SALVAGE PERCENT.. 0					
1969	106.98	1.83	1.96	.8601	92
1971	65.00	1.87	1.22	.8415	55
1972	10,747.29	1.89	203.12	.8316	8,937
1973	5,056.00	1.91	96.57	.8213	4,152
1974	7,373.22	1.93	142.30	.8106	5,977
1975	8,587.37	1.95	167.45	.7995	6,866
1976	66,313.58	1.97	1,306.38	.7880	52,255
1977	4,549.00	1.99	90.53	.7761	3,530
1978	255,947.88	2.01	5,144.55	.7638	195,493
1979	16,569.98	2.03	336.37	.7511	12,446
1980	713,974.98	2.05	14,636.49	.7380	526,914
1981	23,266.00	2.06	479.28	.7210	16,775
1982	49,311.39	2.08	1,025.68	.7072	34,873
1983	67,646.31	2.10	1,420.57	.6930	46,879
1984	32,676.52	2.12	692.74	.6784	22,168
1985	61,229.70	2.13	1,304.19	.6603	40,430
1986	21,965.42	2.15	472.26	.6450	14,168
1987	181,124.12	2.17	3,930.39	.6293	113,981
1988	70,261.38	2.18	1,531.70	.6104	42,888
1989	1,382,612.06	2.20	30,417.47	.5940	821,272
1990	239,241.64	2.22	5,311.16	.5772	138,090
1991	171,937.17	2.23	3,834.20	.5575	95,855
1992	736,477.56	2.25	16,570.75	.5400	397,698
1993	996,540.23	2.26	22,521.81	.5198	518,002
1994	267,822.74	2.28	6,106.36	.5016	134,340
1995	1,124,713.96	2.29	25,755.95	.4809	540,875
1996	533,259.01	2.31	12,318.28	.4620	246,366
1997	1,120,397.24	2.32	25,993.22	.4408	493,871
1998	658,133.08	2.34	15,400.31	.4212	277,206
1999	875,078.79	2.35	20,564.35	.3995	349,594
2000	527,543.67	2.37	12,502.78	.3792	200,045
2001	1,723,813.98	2.38	41,026.77	.3570	615,402
2002	1,013,816.38	2.39	24,230.21	.3346	339,223
2003	1,153,334.82	2.41	27,795.37	.3133	361,340
2004	997,611.57	2.42	24,142.20	.2904	289,706
2005	724,497.68	2.43	17,605.29	.2673	193,658
2006	740,562.48	2.44	18,069.72	.2440	180,697

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47500
UNDERGROUND CONDUIT - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE	ACCRUAL-- AMOUNT (3)	-ACCRUED DEPREC.- FACTOR (4)	AMOUNT (5)	(6)
SURVIVOR CURVE.. IOWA 45-R3						
NET SALVAGE PERCENT.. 0						
2007	826,505.65	2.46	20,332.04	.2214	182,988	
2008	823,804.14	2.47	20,347.96	.1976	162,784	
2009	1,218,501.00		2.48 30,218.82	.1736	211,532	
2010	628,798.14	2.50	15,719.95	.1500	94,320	
2011	850,280.10	2.51	21,342.03	.1255	106,710	
2012	2,024,725.35		2.52 51,023.08	.1008	204,092	
2013	779,737.23	2.54	19,805.33	.0762	59,416	
2014	954,996.60	2.56	24,447.91	.0512	48,896	
2015	837,828.00	2.59	21,699.75	.0259	21,700	
TOTAL	25,529,342.39		608,086.82		8,434,557	

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.38

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47510
UNDERGROUND SERVICES - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R4					
NET SALVAGE PERCENT.. 0					
1978	8,036.30	2.25	180.82	.8550	6,871
1979	16,155.81	2.27	366.74	.8399	13,569
1980	5,116.57	2.30	117.68	.8280	4,237
1981	14,073.55	2.32	326.51	.8120	11,428
1982	6,135.87	2.34	143.58	.7956	4,882
1983	4,112.25	2.36	97.05	.7788	3,203
1984	6,049.74	2.38	143.98	.7616	4,607
1985	2,138.95	2.40	51.33	.7440	1,591
1986	47,595.84	2.42	1,151.82	.7260	34,555
1987	64,385.16	2.44	1,571.00	.7076	45,559
1988	55,348.04	2.46	1,361.56	.6888	38,124
1989	64,080.31	2.48	1,589.19	.6696	42,908
1990	63,917.48	2.49	1,591.55	.6474	41,380
1991	85,692.58	2.51	2,150.88	.6275	53,772
1992	151,300.89	2.52	3,812.78	.6048	91,507
1993	198,187.47	2.54	5,033.96	.5842	115,781
1994	84,518.35	2.55	2,155.22	.5610	47,415
1995	123,873.01	2.56	3,171.15	.5376	66,594
1996	226,325.88	2.57	5,816.58	.5140	116,332
1997	125,671.06	2.58	3,242.31	.4902	61,604
1998	99,659.29	2.59	2,581.18	.4662	46,461
1999	72,633.75	2.60	1,888.48	.4420	32,104
2000	15,457.57	2.61	403.44	.4176	6,455
2001	64,800.69	2.62	1,697.78	.3930	25,467
2002	71,326.99	2.62	1,868.77	.3668	26,163
2003	75,033.52	2.63	1,973.38	.3419	25,654
2004	206,861.36	2.63	5,440.45	.3156	65,285
2005	148,375.29	2.64	3,917.11	.2904	43,088
2006	232,878.86	2.64	6,148.00	.2640	61,480
2007	163,028.84	2.64	4,303.96	.2376	38,736
2008	95,096.67	2.64	2,510.55	.2112	20,084
2009	39,168.58	2.65	1,037.97	.1855	7,266
2010	94,836.76	2.65	2,513.17	.1590	15,079
2011	218,232.54	2.65	5,783.16	.1325	28,916
2012	147,192.07	2.65	3,900.59	.1060	15,602
2013	130,583.26	2.66	3,473.51	.0798	10,421
2014	24,434.17	2.66	649.95	.0532	1,300

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47510
UNDERGROUND SERVICES - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED FACTOR (5)	DEPREC.- AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R4					
NET SALVAGE PERCENT.. 0					
2015	5,824.23	2.66	154.92	.0266	155
TOTAL	3,258,139.55		84,322.06		1,275,635

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.59

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47610
METERS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 15-L0 NET SALVAGE PERCENT.. 0					
1971	3,449.92	2.11	72.79	.9495	3,276
1972	3,988.76	2.15	85.76	.9460	3,773
1973	4,860.49	2.19	106.44	.9417	4,577
1974	1,065.68	2.23	23.76	.9366	998
1975	8,133.29	2.27	184.63	.9307	7,570
1976	2,917.70	2.32	67.69	.9280	2,708
1977	2,160.36	2.37	51.20	.9243	1,997
1978	3,746.59	2.42	90.67	.9196	3,445
1979	468.92	2.47	11.58	.9139	429
1980	4,344.54	2.52	109.48	.9072	3,941
1981	3,588.21	2.58	92.58	.9030	3,240
1982	5,232.71	2.63	137.62	.8942	4,679
1983	562.52	2.69	15.13	.8877	499
1984	2,268.84	2.76	62.62	.8832	2,004
1985	4,581.74	2.82	129.21	.8742	4,005
1986	4,570.19	2.89	132.08	.8670	3,962
1987	8,609.54	2.97	255.70	.8613	7,415
1988	8,594.55	3.04	261.27	.8512	7,316
1989	35,318.78	3.12	1,101.95	.8424	29,753
1990	12,287.10	3.21	394.42	.8346	10,255
1991	10,707.46	3.29	352.28	.8225	8,807
1992	35,072.97	3.39	1,188.97	.8136	28,535
1993	62,568.13	3.49	2,183.63	.8027	50,223
1994	6,205.20	3.59	222.77	.7898	4,901
1995	9,796.96	3.70	362.49	.7770	7,612
1996	8,617.32	3.82	329.18	.7640	6,584
1997	20,081.35	3.95	793.21	.7505	15,071
1998	44,705.48	4.08	1,823.98	.7344	32,832
1999	71,622.77	4.23	3,029.64	.7191	51,504
2000	110,805.59	4.38	4,853.28	.7008	77,653
2001	38,145.57	4.55	1,735.62	.6825	26,034
2002	36,247.34	4.73	1,714.50	.6622	24,003
2003	109,891.92	4.93	5,417.67	.6409	70,430
2004	117,550.99	5.14	6,042.12	.6168	72,505
2005	15,995.63	5.38	860.56	.5918	9,466
2006	8,685.31	5.64	489.85	.5640	4,899
2007	39,074.48	5.94	2,321.02	.5346	20,889

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47610
METERS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 15-L0 NET SALVAGE PERCENT.. 0					
2008	17,879.13	6.27	1,121.02	.5016	8,968
2009	15,460.88	6.66	1,029.69	.4662	7,208
2010	482,251.06	7.11	34,288.05	.4266	205,728
2011	236,057.08	7.64	18,034.76	.3820	90,174
2012	307,089.31	8.28	25,426.99	.3312	101,708
2013	341,869.75	9.08	31,041.77	.2724	93,125
2014	179,359.77	10.16	18,222.95	.2032	36,446
2015	276,382.71	11.79	32,585.52	.1179	32,586
TOTAL	2,722,874.59		198,858.10		1,193,733

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 7.30

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47630
AMR Meters - DISTRIBUTION SYSTEM

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 15-R2.5					
NET SALVAGE PERCENT.. 0					
2007	7,789.88	6.50	506.34	.5850	4,557
2008	29,425.21	6.66	1,959.72	.5328	15,678
2009	11,869.27	6.83	810.67	.4781	5,675
2010	13,357.05	7.00	934.99	.4200	5,610
2011	6,345.06	7.17	454.94	.3585	2,275
2013	16,338.53	7.55	1,233.56	.2265	3,701
2014	13,602.37	7.79	1,059.62	.1558	2,119
2015	1,368.36	8.14	111.38	.0814	111
TOTAL	100,095.73		7,071.22		39,726

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 7.06

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47710
SUBSTATION EQUIPMENT - DISTRIBUTION SYSTEM

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R4 NET SALVAGE PERCENT.. 0					
1960	3,631.70	1.76	63.92	.9856	3,579
1968	16,606.00	1.96	325.48	.9408	15,623
1969	882.00	1.99	17.55	.9353	825
1971	39,959.05	2.05	819.16	.9225	36,862
1972	2,089.52	2.08	43.46	.9152	1,912
1973	56,550.00	2.11	1,193.21	.9073	51,308
1974	446.22	2.14	9.55	.8988	401
1976	333,091.33	2.20	7,328.01	.8800	293,120
1977	70,884.17	2.22	1,573.63	.8658	61,372
1979	14,954.00	2.27	339.46	.8399	12,560
1980	80,834.73	2.30	1,859.20	.8280	66,931
1981	126,329.84	2.32	2,930.85	.8120	102,580
1985	43,522.68	2.40	1,044.54	.7440	32,381
1986	118,315.85	2.42	2,863.24	.7260	85,897
1987	335,797.16	2.44	8,193.45	.7076	237,610
1988	60,907.24	2.46	1,498.32	.6888	41,953
1989	36,582.03	2.48	907.23	.6696	24,495
1990	132,200.60	2.49	3,291.79	.6474	85,587
1991	259,920.34	2.51	6,524.00	.6275	163,100
1992	98,578.56	2.52	2,484.18	.6048	59,620
1993	166,934.17	2.54	4,240.13	.5842	97,523
1994	41,680.13	2.55	1,062.84	.5610	23,383
1996	196,092.49	2.57	5,039.58	.5140	100,792
1997	1,451.70	2.58	37.45	.4902	712
1999	46,617.77	2.60	1,212.06	.4420	20,605
2000	79,093.83	2.61	2,064.35	.4176	33,030
2001	253,074.36	2.62	6,630.55	.3930	99,458
2005	491,706.97	2.64	12,981.06	.2904	142,792
2006	22,338.61	2.64	589.74	.2640	5,897
2012	1,375,919.17	2.65	36,461.86	.1060	145,847
2015	369,018.53	2.66	9,815.89	.0266	9,816
TOTAL	4,876,010.75		123,445.74		2,057,571

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.53

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47810
STREET LIGHTING & SIGNAL SYSTEMS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 30-R3 NET SALVAGE PERCENT.. 0					
1974	2,944.14	2.27	66.83	.9534	2,807
1975	230.46	2.31	5.32	.9471	218
1977	41,318.55	2.39	987.51	.9321	38,513
1978	22,260.89	2.44	543.17	.9272	20,640
1979	9,518.16	2.48	236.05	.9176	8,734
1980	174,357.20	2.53	4,411.24	.9108	158,805
1981	28,371.22	2.57	729.14	.8995	25,520
1982	69,549.87	2.62	1,822.21	.8908	61,955
1983	113,988.36	2.67	3,043.49	.8811	100,435
1984	98,481.92	2.72	2,678.71	.8704	85,719
1985	28,824.06	2.76	795.54	.8556	24,662
1986	347,855.97	2.81	9,774.75	.8430	293,243
1987	136,356.99	2.85	3,886.17	.8265	112,699
1988	209,962.68	2.90	6,088.92	.8120	170,490
1989	572,762.96	2.94	16,839.23	.7938	454,659
1990	266,506.65	2.99	7,968.55	.7774	207,182
1991	222,162.62	3.03	6,731.53	.7575	168,288
1992	89,066.68	3.07	2,734.35	.7368	65,624
1993	353,801.93	3.11	11,003.24	.7153	253,075
1994	245,980.34	3.15	7,748.38	.6930	170,464
1995	310,528.34	3.19	9,905.85	.6699	208,023
1996	107,223.57	3.23	3,463.32	.6460	69,266
1997	413,184.23	3.26	13,469.81	.6194	255,926
1998	217,044.97	3.30	7,162.48	.5940	128,925
1999	249,752.73	3.34	8,341.74	.5678	141,810
2000	210,118.54	3.37	7,080.99	.5392	113,296
2001	356,557.44	3.41	12,158.61	.5115	182,379
2002	194,757.23	3.44	6,699.65	.4816	93,795
2003	588,194.07	3.47	20,410.33	.4511	265,334
2004	504,727.00	3.51	17,715.92	.4212	212,591
2005	106,385.65	3.54	3,766.05	.3894	41,427
2006	799,992.38	3.57	28,559.73	.3570	285,597
2007	524,616.74	3.60	18,886.20	.3240	169,976
2008	217,945.03	3.63	7,911.40	.2904	63,291
2009	584,538.96	3.66	21,394.13	.2562	149,759
2010	196,401.93	3.69	7,247.23	.2214	43,483
2011	476,344.72	3.71	17,672.39	.1855	88,362

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47810
STREET LIGHTING & SIGNAL SYSTEMS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 30-R3					
NET SALVAGE PERCENT.. 0					
2012	517,975.14	3.74	19,372.27	.1496	77,489
2013	326,952.35	3.77	12,326.10	.1131	36,978
2014	174,659.57	3.81	6,654.53	.0762	13,309
2015	279,073.27	3.86	10,772.23	.0386	10,772
TOTAL	10,391,275.51		349,065.29		5,075,520

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 3.36

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47820
SENTINEL LIGHTS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 23-R2					
NET SALVAGE PERCENT.. 0					
1967	2,516.28			1.0000	2,516
1973	1,471.00	2.36	34.72	1.0000	1,471
1974	19,675.00	2.38	468.27	.9996	19,667
1975	4,754.00	2.42	115.05	.9922	4,717
1976	14,852.76	2.46	365.38	.9840	14,615
1977	10,540.00	2.51	264.55	.9789	10,318
1978	16,073.00	2.55	409.86	.9690	15,575
1979	29,321.00	2.60	762.35	.9620	28,207
1980	18,970.00	2.65	502.71	.9540	18,097
1981	17,037.00	2.70	460.00	.9450	16,100
1982	9,135.00	2.76	252.13	.9384	8,572
1983	10,835.00	2.81	304.46	.9273	10,047
1984	19,067.94	2.87	547.25	.9184	17,512
1985	10,529.38	2.93	308.51	.9083	9,564
1986	31,912.79	2.99	954.19	.8970	28,626
1987	14,211.05	3.06	434.86	.8874	12,611
1988	13,496.10	3.12	421.08	.8736	11,790
1989	7,391.51	3.19	235.79	.8613	6,366
1990	3,329.07	3.26	108.53	.8476	2,822
1991	2,562.75	3.33	85.34	.8325	2,133
1992	10,584.67	3.40	359.88	.8160	8,637
1993	152.13	3.47	5.28	.7981	121
1997	15,872.16	3.77	598.38	.7163	11,369
1999	448.69	3.92	17.59	.6664	299
TOTAL 284,738.28		8,016.16		261,752	

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.82

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47910
LINES TRANSFORMERS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3					
NET SALVAGE PERCENT.. 0					
1946	226.33	1.40	3.17	.9800	222
1947	1,242.88	1.42	17.65	.9798	1,218
1948	1,616.79	1.43	23.12	.9724	1,572
1950	28.96	1.46	0.42	.9636	28
1951	15,430.61	1.48	228.37	.9620	14,844
1952	20,900.00	1.50	313.50	.9600	20,064
1953	2,758.00	1.51	41.65	.9513	2,624
1954	5,453.44	1.53	83.44	.9486	5,173
1955	21,326.43	1.55	330.56	.9455	20,164
1956	3,729.00	1.57	58.55	.9420	3,513
1958	2,255.00	1.60	36.08	.9280	2,093
1959	18,726.00	1.62	303.36	.9234	17,292
1960	37,037.01	1.64	607.41	.9184	34,015
1961	10,822.00	1.66	179.65	.9130	9,880
1962	9,436.00	1.68	158.52	.9072	8,560
1963	24,530.00	1.71	419.46	.9063	22,232
1964	6,995.00	1.73	121.01	.8996	6,293
1965	13,727.00	1.75	240.22	.8925	12,251
1966	36,590.20	1.77	647.65	.8850	32,382
1967	62,098.06	1.79	1,111.56	.8771	54,466
1968	177,420.30	1.81	3,211.31	.8688	154,143
1969	36,493.00	1.83	667.82	.8601	31,388
1970	45,587.28	1.85	843.36	.8510	38,795
1971	67,809.76	1.87	1,268.04	.8415	57,062
1972	75,979.83	1.89	1,436.02	.8316	63,185
1973	66,084.52	1.91	1,262.21	.8213	54,275
1974	68,178.64	1.93	1,315.85	.8106	55,266
1975	104,348.19	1.95	2,034.79	.7995	83,426
1976	70,134.81	1.97	1,381.66	.7880	55,266
1977	93,118.67	1.99	1,853.06	.7761	72,269
1978	134,802.37	2.01	2,709.53	.7638	102,962
1979	190,821.12	2.03	3,873.67	.7511	143,326
1980	188,362.44	2.05	3,861.43	.7380	139,011
1981	181,134.58	2.06	3,731.37	.7210	130,598
1982	123,915.27	2.08	2,577.44	.7072	87,633
1983	64,502.74	2.10	1,354.56	.6930	44,700
1984	57,282.99	2.12	1,214.40	.6784	38,861

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 47910
LINES TRANSFORMERS - DISTRIBUTION

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 45-R3					
NET SALVAGE PERCENT.. 0					
1985	202,326.99	2.13	4,309.56	.6603	133,597
1986	202,397.87	2.15	4,351.55	.6450	130,547
1987	504,228.72	2.17	10,941.76	.6293	317,311
1988	304,711.88	2.18	6,642.72	.6104	185,996
1989	484,386.53	2.20	10,656.50	.5940	287,726
1990	724,049.66	2.22	16,073.90	.5772	417,921
1991	764,970.74	2.23	17,058.85	.5575	426,471
1992	766,948.57	2.25	17,256.34	.5400	414,152
1993	940,708.96	2.26	21,260.02	.5198	488,981
1994	504,127.56	2.28	11,494.11	.5016	252,870
1995	470,411.85	2.29	10,772.43	.4809	226,221
1996	655,826.00	2.31	15,149.58	.4620	302,992
1997	483,468.09	2.32	11,216.46	.4408	213,113
1998	494,548.10	2.34	11,572.43	.4212	208,304
1999	361,712.28	2.35	8,500.24	.3995	144,504
2000	321,970.43	2.37	7,630.70	.3792	122,091
2001	460,073.59	2.38	10,949.75	.3570	164,246
2002	539,708.29	2.39	12,899.03	.3346	180,586
2003	740,112.16	2.41	17,836.70	.3133	231,877
2004	754,005.62	2.42	18,246.94	.2904	218,963
2005	1,387,403.02	2.43	33,713.89	.2673	370,853
2006	1,479,866.27	2.44	36,108.74	.2440	361,087
2007	1,586,356.93	2.46	39,024.38	.2214	351,219
2008	1,947,975.12	2.47	48,114.99	.1976	384,920
2009	1,715,873.43	2.48	42,553.66	.1736	297,876
2010	1,417,317.89	2.50	35,432.95	.1500	212,598
2011	1,790,136.13	2.51	44,932.42	.1255	224,662
2012	2,548,903.51	2.52	64,232.37	.1008	256,929
2013	1,438,016.76	2.54	36,525.63	.0762	109,577
2014	1,216,219.55	2.56	31,135.22	.0512	62,270
2015	1,565,230.73	2.59	40,539.48	.0259	40,539
TOTAL	30,814,898.45		736,655.17		9,362,051

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.39

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48200
STRUCTURES AND IMPROVEMENTS - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-L3					
NET SALVAGE PERCENT.. 0					
1972	59,482.48	1.85	1,100.43	.8140	48,419
1973	16,635.00	1.88	312.74	.8084	13,448
1974	46,735.00	1.92	897.31	.8064	37,687
1976	1,500.00	1.98	29.70	.7920	1,188
1977	1,015.00	2.02	20.50	.7878	800
1979	14,807.00	2.10	310.95	.7770	11,505
1981	12,462.00	2.17	270.43	.7595	9,465
1982	21,706.00	2.21	479.70	.7514	16,310
1984	24,285.00	2.29	556.13	.7328	17,796
1986	2,778.08	2.37	65.84	.7110	1,975
1987	379,195.74	2.41	9,138.62	.6989	265,020
1988	87,857.59	2.44	2,143.73	.6832	60,024
1989	3,500.00	2.48	86.80	.6696	2,344
1990	45,253.00	2.51	1,135.85	.6526	29,532
1991	1,424,433.43	2.54	36,180.61	.6350	904,515
1992	300,985.15	2.57	7,735.32	.6168	185,648
1993	117,588.04	2.60	3,057.29	.5980	70,318
1994	58,849.20	2.62	1,541.85	.5764	33,921
1995	33,602.05	2.64	887.09	.5544	18,629
1996	25,776.27	2.66	685.65	.5320	13,713
1997	55,730.18	2.68	1,493.57	.5092	28,378
1998	83,574.87	2.70	2,256.52	.4860	40,617
1999	9,019.44	2.72	245.33	.4624	4,171
2000	50,931.86	2.73	1,390.44	.4368	22,247
2001	47,503.75	2.75	1,306.35	.4125	19,595
2002	25,441.90	2.76	702.20	.3864	9,831
2003	46,885.37	2.77	1,298.72	.3601	16,883
2004	43,752.30	2.79	1,220.69	.3348	14,648
2005	3,289.66	2.80	92.11	.3080	1,013
2006	83,642.46	2.80	2,341.99	.2800	23,420
2007	12,536.74	2.81	352.28	.2529	3,171
2008	76,025.95	2.82	2,143.93	.2256	17,151
2009	7,335.25	2.82	206.85	.1974	1,448
2010	98,128.40	2.83	2,777.03	.1698	16,662
2011	64,924.42	2.83	1,837.36	.1415	9,187
2012	186,651.84	2.83	5,282.25	.1132	21,129
2013	508,000.19	2.83	14,376.41	.0849	43,129

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48200
STRUCTURES AND IMPROVEMENTS - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-L3					
NET SALVAGE PERCENT.. 0					
2014	914,155.05	2.83	25,870.59	.0566	51,741
2015	29,500.77	2.83	834.87	.0283	835
TOTAL	5,025,476.43		132,666.03		2,087,513

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.64

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48300
OFFICE FURNITURE AND EQUIPMENT GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL LIFE (3)	ACCRUAL-- RATE (4)	AMOUNT (5)	-ACCRUED DEPREC.- FACTOR (6)	AMOUNT (7)

SURVIVOR CURVE.. 15-SQUARE
NET SALVAGE PERCENT.. 0

1998	13,293.49			1.0000	13,293	
1999	9,525.19			1.0000	9,525	
2000	2,749.22			1.0000	2,749	
2001	5,644.80			1.0000	5,645	
2005	1,768.79	15.00	6.67	117.98	.7333	1,297
2006	5,995.34	15.00	6.67	399.89	.6667	3,997
2007	10,018.97	15.00	6.67	668.27	.6000	6,011
2008	10,493.44	15.00	6.67	699.91	.5333	5,596
2009	858.00	15.00	6.67	57.23	.4667	400
2010	10,095.47	15.00	6.67	673.37	.4000	4,038
2011	71,272.97	15.00	6.67	4,753.91	.3333	23,755
2012	36,986.83	15.00	6.67	2,467.02	.2667	9,864
2013	32,666.81	15.00	6.67	2,178.88	.2000	6,533
2014	20,480.63	15.00	6.67	1,366.06	.1333	2,730
2015	4,105.37	15.00	6.67	273.83	.0667	274
TOTAL	235,955.32			13,656.35		95,707

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 5.79

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48320
COMPUTERS - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	LIFE (3)	ANNUAL RATE (4)	ACCRUAL AMOUNT (5)	ACCRUED DEPREC. FACTOR (6)	AMOUNT (7)

SURVIVOR CURVE.. 5-SQUARE
NET SALVAGE PERCENT.. 0

2008	2,677.00			1.0000	2,677	
2009	1,308.00			1.0000	1,308	
2010	4,466.89			1.0000	4,467	
2011	35,893.75			1.0000	35,894	
2012	2,384.91	5.00	20.00	476.98	.8000	1,908
2013	78,364.82	5.00	20.00	15,672.96	.6000	47,019
2014	3,005.75	5.00	20.00	601.15	.4000	1,202
2015	10,106.75	5.00	20.00	2,021.35	.2000	2,021
TOTAL	138,207.87			18,772.44		96,496

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 13.58

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48400
VEHICLES

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 12-L0 NET SALVAGE PERCENT.. 0					
1988	4,868.01	3.22	156.75	.9016	4,389
1989	24,222.19	3.31	801.75	.8937	21,647
1994	156,818.41	3.85	6,037.51	.8470	132,825
1995	15,460.68	3.98	615.34	.8358	12,922
1996	133,507.43	4.12	5,500.51	.8240	110,010
1997	26,207.87	4.27	1,119.08	.8113	21,262
1998	7,785.70	4.43	344.91	.7974	6,208
1999	33,049.98	4.59	1,516.99	.7803	25,789
2000	2,330.56	4.78	111.40	.7648	1,782
2001	46,493.14	4.98	2,315.36	.7470	34,730
2006	151,016.04	6.29	9,498.91	.6290	94,989
2007	466,169.36	6.65	31,000.26	.5985	279,002
2008	137,140.79	7.06	9,682.14	.5648	77,457
2009	165,961.58	7.53	12,496.91	.5271	87,478
2010	319,919.03	8.08	25,849.46	.4848	155,097
2011	53,875.44	8.74	4,708.71	.4370	23,544
2012	668,831.60	9.56	63,940.30	.3824	255,761
2013	440,883.81	10.59	46,689.60	.3177	140,069
2014	723,751.21	11.99	86,777.77	.2398	173,556
2015	883,994.21	14.17	125,261.98	.1417	125,262
TOTAL	4,462,287.04		434,425.64		1,783,779

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 9.74

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48500
TOOLS AND INSTRUMENTS - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR	ORIGINAL COST	--ANNUAL LIFE	ACCRUAL RATE	--AMOUNT	-ACCRUED DEPREC. - FACTOR	AMOUNT
(1)	(2)	(3)	(4)	(5)	(6)	(7)

SURVIVOR CURVE.. 15-SQUARE
NET SALVAGE PERCENT.. 0

1998	18,273.33			1.0000	18,273	
1999	56,616.80			1.0000	56,617	
2000	6,165.19			1.0000	6,165	
2001	8,154.41			1.0000	8,154	
2002	87,464.05	15.00	6.67	5,833.85	.9333	81,630
2003	23,570.94	15.00	6.67	1,572.18	.8667	20,429
2004	36,733.49	15.00	6.67	2,450.12	.8000	29,387
2005	9,781.49	15.00	6.67	652.43	.7333	7,173
2006	55,899.76	15.00	6.67	3,728.51	.6667	37,268
2007	48,284.13	15.00	6.67	3,220.55	.6000	28,970
2008	45,514.89	15.00	6.67	3,035.84	.5333	24,273
2009	37,388.92	15.00	6.67	2,493.84	.4667	17,449
2010	176,091.78	15.00	6.67	11,745.32	.4000	70,437
2011	66,921.00	15.00	6.67	4,463.63	.3333	22,305
2012	141,609.35	15.00	6.67	9,445.34	.2667	37,767
2013	85,263.56	15.00	6.67	5,687.08	.2000	17,053
2014	131,336.53	15.00	6.67	8,760.15	.1333	17,507
2015	112,105.28	15.00	6.67	7,477.42	.0667	7,477
TOTAL	1,147,174.90			70,566.26		508,334

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 6.15

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48600
COMMUNICATION STRUCTURES AND EQUIPMENT - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	LIFE (3)	ANNUAL RATE (4)	ACCRUAL AMOUNT (5)	ACCRUED DEPREC. FACTOR (6)	AMOUNT (7)
SURVIVOR CURVE.. 15-SQUARE NET SALVAGE PERCENT.. 0						
1981	12,328.84			1.0000	12,329	
1982	997.00			1.0000	997	
1983	2,693.00			1.0000	2,693	
1985	7,145.00			1.0000	7,145	
1986	5,470.00			1.0000	5,470	
1987	654.46			1.0000	654	
1988	3,067.50			1.0000	3,068	
1989	6,505.50			1.0000	6,506	
1990	12,083.42			1.0000	12,083	
1991	5,466.50			1.0000	5,467	
1992	8,287.00			1.0000	8,287	
1993	4,525.80			1.0000	4,526	
1994	37,148.37			1.0000	37,148	
1995	8,886.16			1.0000	8,886	
1996	12,061.22			1.0000	12,061	
1997	32,424.05			1.0000	32,424	
1998	4,662.16			1.0000	4,662	
1999	179,948.08			1.0000	179,948	
2000	19,678.50			1.0000	19,679	
2001	11,510.86			1.0000	11,511	
2002	5,582.26	15.00	6.67	372.34	.9333	5,210
2003	649.95	15.00	6.67	43.35	.8667	563
2004	1,628.00	15.00	6.67	108.59	.8000	1,302
2005	9,903.90	15.00	6.67	660.59	.7333	7,263
2006	41,356.93	15.00	6.67	2,758.51	.6667	27,573
2007	54,141.89	15.00	6.67	3,611.26	.6000	32,485
2008	59,380.00	15.00	6.67	3,960.65	.5333	31,667
2009	47,209.25	15.00	6.67	3,148.86	.4667	22,033
2010	228,077.07	15.00	6.67	15,212.74	.4000	91,231
2011	49,344.03	15.00	6.67	3,291.25	.3333	16,446
2012	72,958.39	15.00	6.67	4,866.32	.2667	19,458
2013	78,277.32	15.00	6.67	5,221.10	.2000	15,655
2014	34,478.58	15.00	6.67	2,299.72	.1333	4,596
2015	148,552.96	15.00	6.67	9,908.48	.0667	9,908
TOTAL	1,207,083.95			55,463.76		660,934

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 4.59

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

ACCOUNT 48820
HOUSES - GENERAL PLANT

CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

YEAR (1)	ORIGINAL COST (2)	--ANNUAL RATE (3)	ACCRUAL-- AMOUNT (4)	-ACCRUED DEPREC.- FACTOR (5)	AMOUNT (6)
SURVIVOR CURVE.. IOWA 40-R3					
NET SALVAGE PERCENT.. 0					
1981	5,448.00	2.23	121.49	.7805	4,252
1983	3,328.00	2.28	75.88	.7524	2,504
1986	12,922.45	2.35	303.68	.7050	9,110
1988	27,878.53	2.39	666.30	.6692	18,656
1989	2,150.47	2.41	51.83	.6507	1,399
1994	47,598.40	2.52	1,199.48	.5544	26,389
1995	1,870.05	2.54	47.50	.5334	997
1996	3,034.23	2.56	77.68	.5120	1,554
1997	9,320.80	2.57	239.54	.4883	4,551
1999	21,561.08	2.61	562.74	.4437	9,567
2000	8,693.67	2.63	228.64	.4208	3,658
2003	3,969.00	2.68	106.37	.3484	1,383
2005	19,559.47	2.72	532.02	.2992	5,852
2006	26,786.84	2.73	731.28	.2730	7,313
2007	48,132.03	2.75	1,323.63	.2475	11,913
2008	56,889.23	2.76	1,570.14	.2208	12,561
2009	1,543.92	2.78	42.92	.1946	300
2010	7,346.76	2.80	205.71	.1680	1,234
2011	367.33	2.81	10.32	.1405	52
2012	1,425.00	2.83	40.33	.1132	161
2013	7,049.02	2.85	200.90	.0855	603
2014	2,995.65	2.87	85.98	.0574	172
2015	40,666.92	2.91	1,183.41	.0291	1,183
TOTAL 360,536.85			9,607.77		125,364

COMPOSITE ANNUAL ACCRUAL RATE, PERCENT.. 2.66

YUKON ELECTRICAL COMPANY LIMITED 2/26/16

SURVIVING AT DECEMBER 31, 2015

SUMMARY OF
CALCULATED ANNUAL AND ACCRUED DEPRECIATION
AS OF 6-30-2016

ACCT DEPRECIATION	AVG GRP	AGE	ANNUAL ACCRUAL ORIGINAL COST	RATE	ACCRUED AMOUNT	
422.00	2.8	2,189,065.17	2.95	64,521	165,236	
423.00	6.9	5,119,253.11	2.42	123,953	714,673	
425.00	5.5	3,058,157.70	2.48	75,907	391,238	
426.00	22.4	81,241.84	2.291,864	41,362		
427.00	3.3	68,086.68	4.282,912	8,873		
442.00	8.0	5,656,734.08	2.90	164,006	1,130,160	
444.00	14.0	3,138,140.07	2.96	92,864	1,278,178	
445.00	11.0	12,371,681.44	3.90	483,036	4,788,788	
446.00	9.8	4,351,535.63	3.09	134,456	1,183,988	
447.00	7.7	1,332,729.65	2.77	36,979	267,129	
457.00	25.7	1,144,289.37	2.04	23,361	591,838	
471.00	10.5	1,578,818.43	1.50	23,671	244,634	
473.00	13.4	41,322,714.82	2.39	988,477	12,540,774	
474.00	14.0	25,527,087.24	2.31	588,564	7,976,218	
474.10	19.1	3,168,666.15	2.31	73,065	1,309,686	
475.00	14.4	25,529,342.39	2.38	608,087	8,434,557	
475.10	15.3	3,258,139.55	2.59	84,322	1,275,635	
476.10	8.4	2,722,874.59	7.30	198,858	1,193,733	
476.30	5.8	100,095.73	7.067,071	39,726		
477.10	17.4	4,876,010.75	2.53	123,446	2,057,571	
478.10	15.5	10,391,275.51	3.36	349,065	5,075,520	
478.20	33.2	284,738.28	2.828,016	261,752		
479.10	13.5	30,814,898.45	2.39	736,655	9,362,051	
482.00	16.6	5,025,476.43	2.64	132,666	2,087,513	
483.00	6.3	235,955.32	5.79	13,656	95,707	
483.20	3.6	138,207.87	13.58	18,772	96,496	
484.00	5.7	4,462,287.04	9.74	434,426	1,783,779	
485.00	6.8	1,147,174.90	6.15	70,566	508,334	
486.00	9.7	1,207,083.95	4.59	55,464	660,934	
488.20	13.6	360,536.85	2.669,608	125,364		
GRAND TOTAL	13.0	200,662,298.99	2.85	5,728,314	65,691,447	

CW-YECL-20

Reference: YECL Application, Attachment 8.1, Concentric Report

Issue/sub-issue: Return on Rate Base

Preamble: YECL has provided a report from Concentric Energy Advisors (Concentric) to justify the premium over the BCUC approved ROE. CW requires information to assess the Concentric Report.

Request:

- (a) Please provide the cost of the Concentric Report.
- (b) Please provide the dollar value of the incremental ROE arising from the Concentric Report.
- (c) In Figure 1, Concentric provides a list of comparators. Please fully explain why a smaller utility such as AltaGas Utilities Inc. was not used. Please provide data for AltaGas Utilities Inc.
- (d) In Figure 2, Concentric compares the Yukon to Canada. Please fully explain why a comparison to the Northwest Territories, Alberta, or British Columbia is not more relevant. Please provide an updated Figure 2 including the Northwest Territories, Alberta, and British Columbia.
- (e) Please provide an updated Figure 3 including April, May, June, and July 2016. Also please provide the underlying data for the chart.
- (f) Please provide an updated Figure 4 including April, May, June, and July 2016. Also please provide the underlying data for the chart.
- (g) Please provide an updated Figure 5 including April, May, June, and July 2016. Also please provide the underlying data for the chart.
- (h) On page 17, Concentric lists comparators, including ATCO Electric Distribution. Please fully explain why the use of YECL's parent is an appropriate comparator.
- (i) On page 20, Concentric indicates that size is an important consideration for investors. Please fully explain how investors may consider the fact that YECL is a part of a larger group, such as ATCO, Canadian Utilities Ltd, or CU Inc.

- (j) Starting on page 21, Concentric discusses a number of risks. For each risk:
- i. Please fully explain if there is a current deferral account for the risk. If there is a deferral account, please fully explain how the deferral account works, and how the presence of the deferral account impacts risk, and the Concentric conclusion.
 - ii. For each risk that has no deferral account, please fully explain the impact that implementing a deferral account would have on the Concentric recommendation.
 - iii. Please provide a detailed quantification and calculation of the impact of each risk on return.
 - iv. Please comment on how a different rate design, such as a daily fixed charge, and no volume charge, would impact the Concentric recommendation.

Response:

- (a) Please refer to response to UCG-AEY-34(a). AEY will submit costs with respect to this proceeding as part of its cost claim.
- (b) AEY does not consider the dollar amount of the ROE premium to be relevant in the determination of the appropriate ROE. The incremental revenue associated with a 60 basis point ROE premium is approximately \$250,000 for 2016 and \$270,000 for 2017.
- (c) The only gas distributors that were included in Concentric's comparator group (i.e., FortisBC Energy and PNG-West) provide distribution service in British Columbia, which is the province selected as the benchmark. The other companies selected for the comparator group are electric utilities which more closely align with AEY's business, and have different risk profiles than gas distributors. Concentric has therefore not researched the comparable data for AltaGas Utilities or other Canadian gas distributors for these purposes.

Figure 1: Allowed ROEs and Equity Ratios

	Allowed ROE	Equity Ratio	Risk Compared to AEY
ATCO Electric Yukon	8.75%	40.0%	N/A
Canadian Electric & Gas Utilities			
FortisBC Energy	8.75%	38.5%	Lower
FortisBC Electric	9.15%	40.0%	Lower
Newfoundland Power	8.80%	45.0%	Lower
Maritime Electric Company Ltd	9.35%	40.9%	Similar
ATCO Electric Distribution	8.30%	38.0%	Lower
Pacific Northern Gas-West	9.50%	46.5%	Higher
Alta Gas	8.30%	42.0%	
2014-2016 U.S. Electric Utilities			
Electric T&D Utilities	9.41%	49.4%	Lower

- (d) Economic data for British Columbia and Alberta are provided in CW-YECL-20 Attachment 1. Limited economic data are also provided for the Northwest Territories in the same Attachment 1.
- (e) Please refer to CW-YECL-20 Attachment 2.
- (f) Please refer to CW-YECL-20 Attachment 2.
- (g) Please refer to CW-YECL-20 Attachment 2.
- (h) Due to the limited number of electric utilities in Canada that are publicly-owned, as well as the geographic proximity of ATCO Electric Distribution to AEY, Concentric determined that it was reasonable to include ATCO Electric Distribution in the comparator group. As explained in the report, ATCO Electric Distribution does not own generation assets, but it does serve substantially more customers than AEY and has a much larger rate base than AEY.
- (i) Corporate investors would consider the aggregated mix of businesses under the broader ATCO ownership, and they would recognize that each individual business in the ATCO portfolio has its own risk profile and return requirements. For purposes of setting an allowed regulatory return, please see pages 9-10 of Concentric's report for a discussion of the stand-alone principle. The stand-alone principle provides that the utility is regulated as if it were a stand-alone entity. In this way, capital may be efficiently allocated, with each business

segment earning a return based on its own unique set of risks and business characteristics regardless of affiliations within the holding company structure. In order to establish a fair return and satisfy the stand-alone principle, the utility must be allowed a return sufficient to meet all three requirements of the Fair Return Standard on the basis of the utility's individual merits. For that reason, the size of AEY relative to the comparator group is the relevant consideration, not the fact that AEY is 100% owned by ATCO Electric. As explained on page 10 of the report, as a stand-alone entity, AEY would not be able to issue debt in public markets and likely would not be able to obtain investment grade credit ratings given its small size. AEY's ability to access debt and equity capital through CUI instead of on its own creates tangible benefits and cost savings for AEY's customers.

- (j) The risks listed starting on page 21 of the report are: (1) generation risk; (2) fuel and purchased power risk; (3) volume/demand risk; (4) regulatory environment; (5) deferral/variance accounts; and (6) competition from alternative fuels. The Concentric report describes each of these risks, explains whether AEY has the risk and if so whether AEY has any mechanism to mitigate the risk, and how AEY's risk on each factor compares to the companies in the comparator group.

Generation Risk

- (i) AEY does not have a deferral account for risk associated with company-owned generation, other than risk associated with fuel and purchased power costs, as discussed below.
- (ii) The primary risks of company-owned generation are whether the utility will be able to recover its capital investment in generation assets in a timely manner, and whether there will be new environmental policies that cause the utility to need to make additional investments in order to comply. Another related risk of company-owned generation is whether construction is completed on time and within the budget approved by the regulator. Costs of the capital investment are typically recovered through depreciation rates and through the allowed rate of return on the invested capital. During the construction period, the utility might also be allowed to recover an Allowance for Funds Used During Construction (AFUDC) or a cash return on Construction Work in Progress (CWIP).
- (iii) There is no specific way to quantify the impact of this risk. Given the large magnitude of most investments in generation assets, the credit rating agencies consider timely cost recovery to be very important factor in the company's credit rating. In order to maintain the utility's financial integrity

and credit rating, the rating agencies expect to see regulatory support for the capital investment, as evidenced by the opportunity to fully recover costs all prudently-incurred costs in a timely way.

- (iv) Concentric has not analyzed how a different rate design would impact the risk of AEY relative to the comparator group. However, Mr. Coyne does not believe it would change his recommendation. Furthermore, AEY is not proposing a change in rate design in this proceeding, and Mr. Coyne's understanding is that AEY cannot file a Phase II proceeding until 2018. Lastly, a change in rate design would not affect AEY's generation risk or its fuel and purchased power risk.

Fuel and Purchased Power Risk

- (i) As discussed on page 29 of Concentric's report, AEY's variance accounts for fuel costs and purchased power costs have expired. The accounts have traditionally allowed AEY to recover differences between forecasted and actual fuel prices (not volume), and differences in forecasted purchase power costs (not volume). The Company has requested that those accounts be renewed as part of this GRA filing.
- (ii) If the variance accounts for fuel and purchased power costs are not approved, this would have a material impact on AEY's risk profile
- (iii) Fuel and purchased power costs typically represent a significant portion of a utility's operating costs and a significant portion of the customer's bill. If these accounts are not renewed, there would a significant impact on the Company's ability to earn its allowed return because AEY would take on the risk associated with changes in fuel prices and purchased power costs.
- (iv) Please refer to the response under Generation Risk, above.

Volume/Demand Risk

- (i) AEY does not have any regulatory protection against changes in volume/demand due to weather conditions or demand side management and energy efficiency programs.
- (ii) As discussed on page 23 of Concentric's report, all but one of the electric and gas distribution companies in the comparator group have some form of revenue protection against volumetric risk. The impact of implementing a deferral account for volumetric risk would be to make AEY more like the

comparator companies. Absent such regulatory protection against volume/demand risk, AEY has higher risk on this factor than other similarly-situated electric and gas distribution companies. This is particularly important given the small size of AEY and the increase in electric space heating, which has made it more difficult for AEY to accurately forecast sales, especially among residential customers.

- (iii) Concentric has not attempted to quantify the impact of this risk. However, absent a weather-related variance account, AEY's revenues and earnings will be more variable from year-to-year as abnormal weather has an effect on the Company's sales.
- (iv) Please refer to the response under Generation Risk, above.

Regulatory Environment

- (i) Mr. Coyne does not believe that this question pertains to the broader regulatory environment.
- (ii) N/A
- (iii) N/A
- (iv) N/A

Deferral/Variance Accounts

- (i) Figure 9 of Concentric's report shows whether AEY and other utilities in the comparator group have deferral/variance accounts for five categories of operating costs: Pension/OPEB expenses, Bad Debt Expense, Storm Costs, Changes in Interest Rates; and Energy Efficiency/DSM Costs.
- (ii) N/A
- (iii) N/A
- (iv) N/A

Competition from Alternative Fuels

- (i) AEY does not have a deferral account for the risk associated with competition from alternative fuels.
- (ii) As discussed on page 23 of Concentric's report, all but one of the electric and gas distribution companies in the comparator group have some form of revenue protection against volumetric risk. The impact of implementing a deferral account for volumetric risk would be to make AEY more like the comparator companies. Absent such regulatory protection against volume/demand risk, AEY has higher risk on this factor than other similarly-situated electric and gas distribution companies.
- (iii) As explained on page 26 of Concentric's report, this risk is difficult to quantify and likely does not have a material effect on the risk profile of AEY at this time.
- (v) Please refer to the response under Generation Risk, above.

Figure 2: Key Economic Indicators[1]

Economic Indicator	Yukon 2013	Yukon 2014	Yukon 2015	Yukon 2016	
GDP Growth	1.0%[2]	-1.20%	-6.00%	3.50%	
Population Growth	1.90%	1.70%	0.60%	1.00%	
Unemployment Rate	5.40%	4.30%	6.70%	7.50%	
Retail Sales	-2.50%	1.30%	-2.60%	2.80%	
Consumer Prices	1.60%	1.30%	-0.60%	2.20%	
	Canada 2013	Canada 2014	Canada 2015	Canada 2016	As reported in original filing
GDP Growth	2.00%	2.40%	0.80%	2.50%	
Population Growth	1.20%	1.10%	0.90%	1.00%	
Unemployment Rate	7.10%	6.90%	6.90%	7.00%	
Retail Sales	3.20%	4.60%	2.20%	3.40%	
Consumer Prices	0.90%	2.00%	1.10%	2.00%	
	BC 2013	BC 2014	BC 2015	BC 2016	
GDP Growth	2.0%	2.2%	2.6%	2.5%	[3]
Population Growth	0.9%	1.0%	1.1%	1.1%	[3]
Unemployment Rate	6.6%	6.1%	6.0%	5.7%	[3]
Retail Sales	2.4%	5.4%	3.9%	4.0%	[3]
Consumer Prices	-0.1%	1.3%	1.9%	2.1%	[3]
	Alberta 2013	Alberta 2014	Alberta 2015	Alberta 2016	
GDP Growth	3.8%	4.0%	-1.5%	1.2%	[3]
Population Growth	3.0%	2.9%	2.1%	1.7%	[3]
Unemployment Rate	4.6%	4.7%	5.6%	5.8%	[3]
Retail Sales	6.9%	7.6%	-1.9%	2.3%	[3]
Consumer Prices	1.4%	2.6%	1.2%	2.2%	[3]
	NWT 2013	NWT 2014	NWT 2015	NWT 2016	
GDP Growth	4.0%	5.9%	2.5%		[4]
Population Growth	0.5%	0.2%	0.2%		[5]
Unemployment Rate					[6]
Retail Sales	0.4%	2.2%	4.3%		[7]
Consumer Prices	1.5%	1.7%	1.6%		[8]

[1] For Yukon, economic indicators are as reported by the Department of Economic Development for the Yukon Government (February 2014 Outlook; October 2015 Outlook). For Canada, economic indicators are from The Conference Board of Canada and the World Bank.

[2] According to the Yukon Economic Outlook published in January 2015, actual GDP growth for 2013 was (0.7%) as reported by Statistics Canada.

[3] Conference Board of Canada, Provincial Outlook Long-Term Economic Forecast, 2015.

[4] Statistics Canada, Table 379-0030

[5] Statistics Canada, Table 051-0001

[6] Data for NWT not available through Statistics Canada

[7] Statistics Canada, Table 080-0020

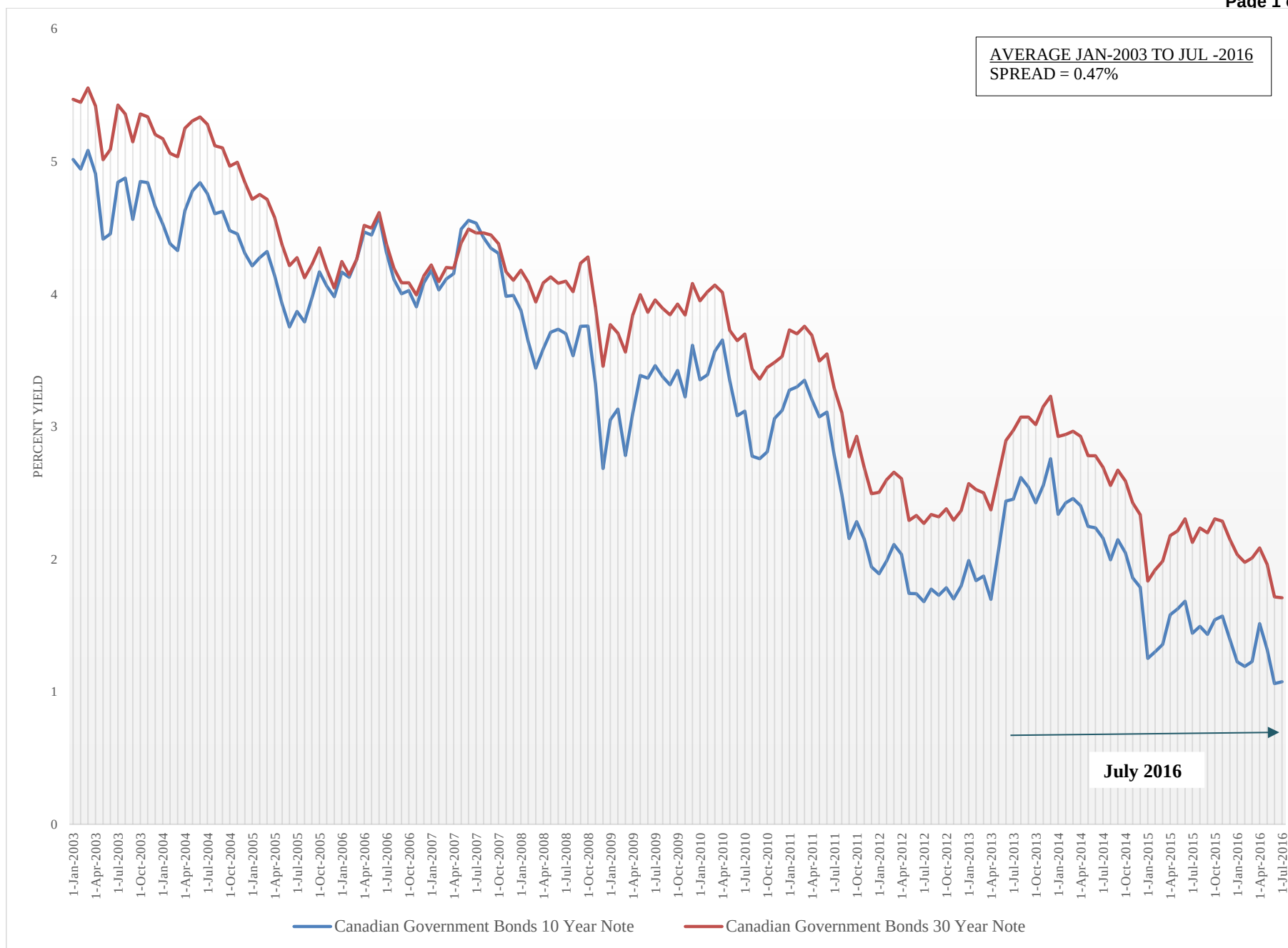
[8] Statistics Canada, Table 036-0020

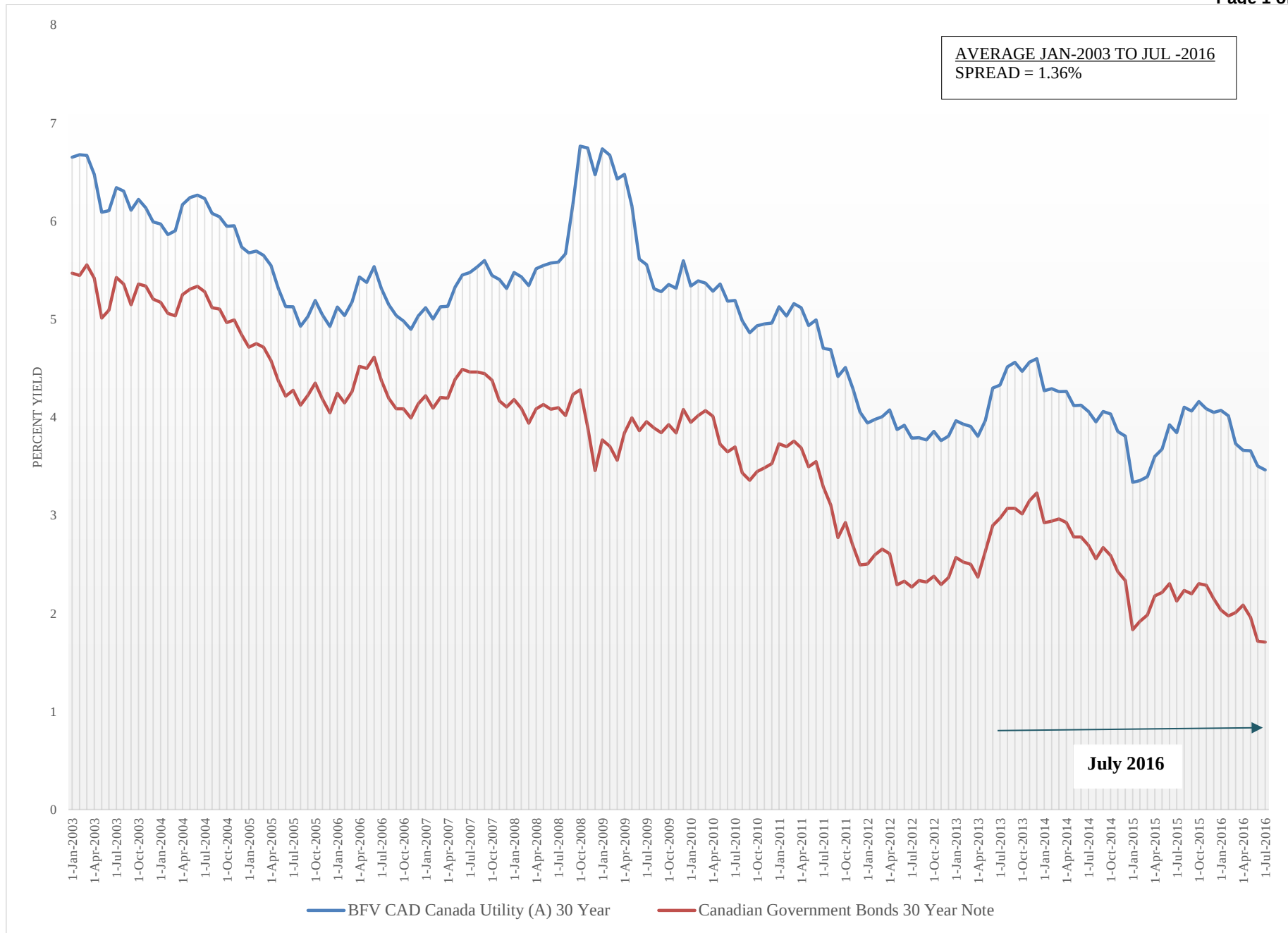
Security	Canadian Government Bonds 10 Year Note	Canadian Government Bonds 30 Year Note	BFV CAD Canada Utility (A) 30 Year	Spread - Figure 3 0.470546012	Spread - Figure 4, 5 1.359677914
	GCAN10YR Index	GCAN30YR Index	C29530Y Index		
Date					
2016-07-19	1.075	1.708	3.4619	0.633	1.7539
2016-06-30	1.061	1.716	3.501	0.655	1.785
2016-05-31	1.319	1.961	3.6588	0.642	1.6978
2016-04-29	1.513	2.084	3.6631	0.571	1.5791
2016-03-31	1.227	2.008	3.7306	0.781	1.7226
2016-02-29	1.191	1.975	4.0147	0.784	2.0397
2016-01-29	1.225	2.035	4.0707	0.81	2.0357
2015-12-31	1.394	2.149	4.0498	0.755	1.9008
2015-11-30	1.57	2.286	4.0854	0.716	1.7994
2015-10-30	1.542	2.304	4.1593	0.762	1.8553
2015-09-30	1.432	2.199	4.063	0.767	1.864
2015-08-31	1.493	2.235	4.1032	0.742	1.8682
2015-07-31	1.441	2.126	3.8419	0.685	1.7159
2015-06-30	1.683	2.303	3.922	0.62	1.619
2015-05-29	1.624	2.213	3.6744	0.589	1.4614
2015-04-30	1.581	2.178	3.5995	0.597	1.4215
2015-03-31	1.357	1.984	3.3936	0.627	1.4096
2015-02-27	1.301	1.919	3.3539	0.618	1.4349
2015-01-30	1.251	1.834	3.337	0.583	1.503
2014-12-31	1.788	2.335	3.8073	0.547	1.4723
2014-11-28	1.858	2.424	3.8534	0.566	1.4294
2014-10-31	2.048	2.59	4.032	0.542	1.442
2014-09-30	2.146	2.671	4.0593	0.525	1.3883
2014-08-29	1.995	2.556	3.953	0.561	1.397
2014-07-31	2.159	2.694	4.058	0.535	1.364
2014-06-30	2.237	2.78	4.1219	0.543	1.3419
2014-05-30	2.246	2.78	4.1186	0.534	1.3386
2014-04-30	2.404	2.927	4.2634	0.523	1.3364
2014-03-31	2.458	2.964	4.262	0.506	1.298
2014-02-28	2.425	2.941	4.29	0.516	1.349
2014-01-31	2.339	2.925	4.269	0.586	1.344
2013-12-31	2.758	3.229	4.5978	0.471	1.3688
2013-11-29	2.556	3.15	4.5614	0.594	1.4114
2013-10-31	2.424	3.014	4.4681	0.59	1.4541
2013-09-30	2.543	3.072	4.5601	0.529	1.4881
2013-08-30	2.616	3.071	4.5131	0.455	1.4421
2013-07-31	2.452	2.971	4.3285	0.519	1.3575
2013-06-28	2.439	2.896	4.2978	0.457	1.4018
2013-05-31	2.064	2.631	3.9671	0.567	1.3361
2013-04-30	1.697	2.371	3.8052	0.674	1.4342
2013-03-29	1.872	2.5	3.907	0.628	1.407
2013-02-28	1.837	2.524	3.9285	0.687	1.4045
2013-01-31	1.99	2.57	3.9642	0.58	1.3942

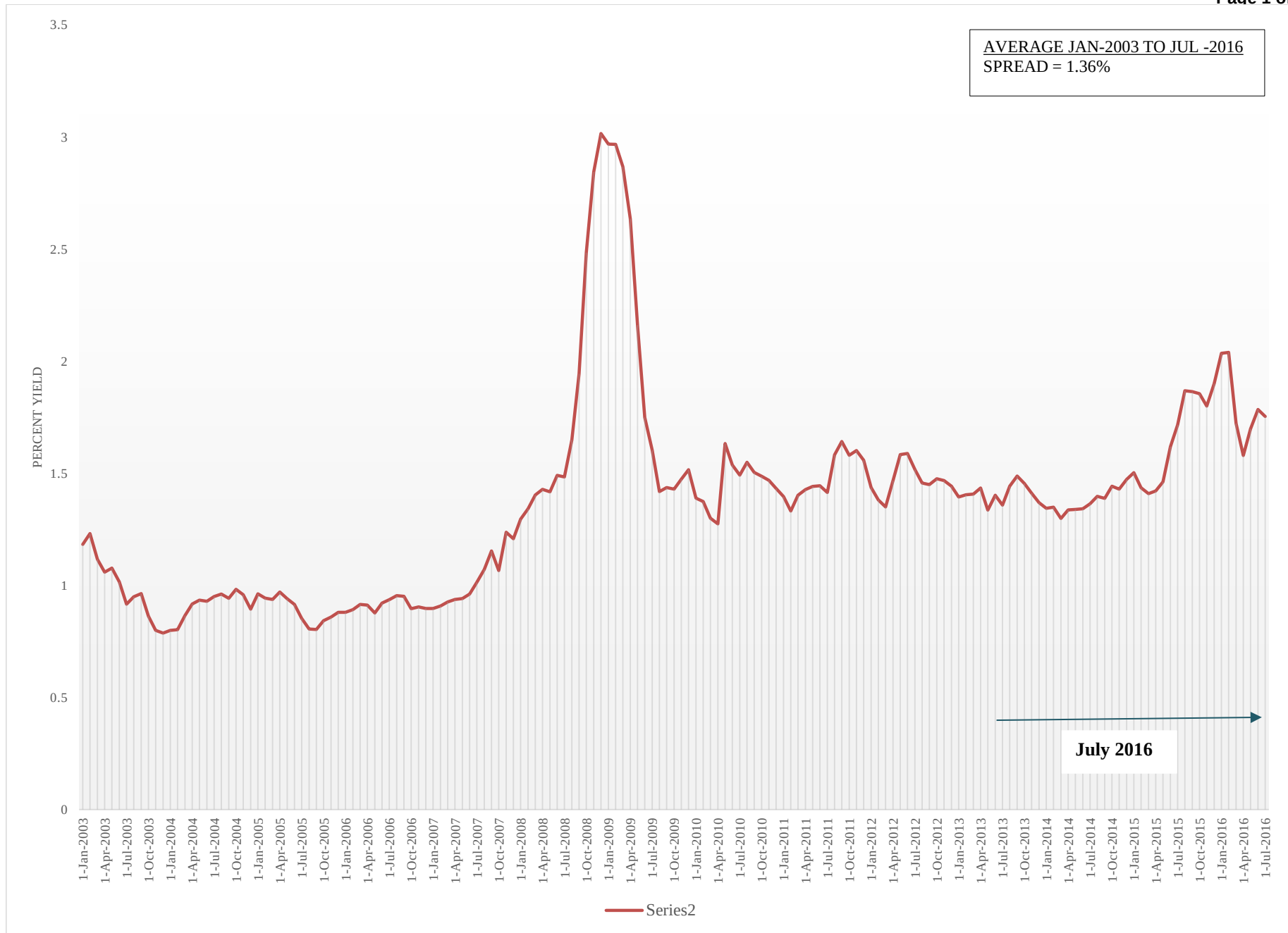
2012-12-31	1.798	2.365	3.8072	0.567	1.4422
2012-11-30	1.7	2.294	3.7613	0.594	1.4673
2012-10-31	1.785	2.38	3.8553	0.595	1.4753
2012-09-28	1.728	2.319	3.7688	0.591	1.4498
2012-08-31	1.774	2.336	3.7925	0.562	1.4565
2012-07-31	1.679	2.269	3.7859	0.59	1.5169
2012-06-29	1.739	2.329	3.9171	0.59	1.5881
2012-05-31	1.741	2.292	3.8749	0.551	1.5829
2012-04-30	2.037	2.608	4.0751	0.571	1.4671
2012-03-30	2.111	2.656	4.0057	0.545	1.3497
2012-02-29	1.987	2.598	3.9786	0.611	1.3806
2012-01-31	1.889	2.504	3.94	0.615	1.436
2011-12-30	1.941	2.494	4.0519	0.553	1.5579
2011-11-30	2.151	2.692	4.2938	0.541	1.6018
2011-10-31	2.283	2.926	4.5063	0.643	1.5803
2011-09-30	2.155	2.772	4.414	0.617	1.642
2011-08-31	2.49	3.106	4.6886	0.616	1.5826
2011-07-29	2.784	3.289	4.7028	0.505	1.4138
2011-06-30	3.11	3.547	4.9919	0.437	1.4449
2011-05-31	3.074	3.494	4.9354	0.42	1.4414
2011-04-29	3.205	3.689	5.1163	0.484	1.4273
2011-03-31	3.35	3.756	5.158	0.406	1.402
2011-02-28	3.299	3.699	5.0307	0.4	1.3317
2011-01-31	3.275	3.729	5.1252	0.454	1.3962
2010-12-31	3.122	3.528	4.9608	0.406	1.4328
2010-11-30	3.061	3.483	4.9516	0.422	1.4686
2010-10-29	2.81	3.446	4.933	0.636	1.487
2010-09-30	2.758	3.357	4.861	0.599	1.504
2010-08-31	2.776	3.433	4.9826	0.657	1.5496
2010-07-30	3.116	3.698	5.19	0.582	1.492
2010-06-30	3.081	3.647	5.1842	0.566	1.5372
2010-05-31	3.347	3.725	5.3581	0.378	1.6331
2010-04-30	3.653	4.011	5.2854	0.358	1.2744
2010-03-31	3.569	4.067	5.3666	0.498	1.2996
2010-02-26	3.391	4.017	5.3914	0.626	1.3744
2010-01-29	3.353	3.948	5.3372	0.595	1.3892
2009-12-31	3.613	4.079	5.5944	0.466	1.5154
2009-11-30	3.223	3.841	5.3144	0.618	1.4734
2009-10-30	3.423	3.924	5.3529	0.501	1.4289
2009-09-30	3.314	3.843	5.2793	0.529	1.4363
2009-08-31	3.375	3.891	5.3096	0.516	1.4186
2009-07-31	3.459	3.954	5.5571	0.495	1.6031
2009-06-30	3.364	3.862	5.6119	0.498	1.7499
2009-05-29	3.385	3.994	6.155	0.609	2.161
2009-04-30	3.101	3.841	6.4759	0.74	2.6349
2009-03-31	2.782	3.561	6.4289	0.779	2.8679
2009-02-27	3.131	3.704	6.6715	0.573	2.9675
2009-01-30	3.05	3.768	6.7358	0.718	2.9678

2008-12-31	2.684	3.455	6.4707	0.771	3.0157
2008-11-28	3.324	3.902	6.746	0.578	2.844
2008-10-31	3.759	4.279	6.763	0.52	2.484
2008-09-30	3.757	4.233	6.177	0.476	1.944
2008-08-29	3.534	4.017	5.6659	0.483	1.6489
2008-07-31	3.701	4.097	5.5806	0.396	1.4836
2008-06-30	3.734	4.081	5.5714	0.347	1.4904
2008-05-30	3.711	4.129	5.5465	0.418	1.4175
2008-04-30	3.588	4.085	5.5136	0.497	1.4286
2008-03-31	3.44	3.939	5.3426	0.499	1.4036
2008-02-29	3.64	4.09	5.4315	0.45	1.3415
2008-01-31	3.878	4.18	5.4755	0.302	1.2955
2007-12-31	3.99	4.104	5.3122	0.114	1.2082
2007-11-30	3.982	4.167	5.4038	0.185	1.2368
2007-10-31	4.307	4.379	5.4451	0.072	1.0661
2007-09-28	4.344	4.444	5.598	0.1	1.154
2007-08-31	4.425	4.461	5.5321	0.036	1.0711
2007-07-31	4.534	4.461	5.4747	-0.073	1.0137
2007-06-29	4.555	4.489	5.4506	-0.066	0.9616
2007-05-31	4.49	4.387	5.3281	-0.103	0.9411
2007-04-30	4.154	4.194	5.1311	0.04	0.9371
2007-03-30	4.113	4.2	5.1264	0.087	0.9264
2007-02-28	4.03	4.093	5.0014	0.063	0.9084
2007-01-31	4.177	4.219	5.1161	0.042	0.8971
2006-12-29	4.086	4.138	5.0349	0.052	0.8969
2006-11-30	3.903	3.992	4.8962	0.089	0.9042
2006-10-31	4.026	4.085	4.9814	0.059	0.8964
2006-09-29	4.001	4.085	5.0358	0.084	0.9508
2006-08-31	4.109	4.193	5.147	0.084	0.954
2006-07-31	4.314	4.377	5.3133	0.063	0.9363
2006-06-30	4.584	4.614	5.5348	0.03	0.9208
2006-05-31	4.445	4.497	5.374	0.052	0.877
2006-04-28	4.468	4.518	5.4299	0.05	0.9119
2006-03-31	4.262	4.26	5.1752	-0.002	0.9152
2006-02-28	4.126	4.145	5.0367	0.019	0.8917
2006-01-31	4.166	4.244	5.1236	0.078	0.8796
2005-12-30	3.979	4.045	4.9253	0.066	0.8803
2005-11-30	4.06	4.185	5.044	0.125	0.859
2005-10-31	4.167	4.348	5.1905	0.181	0.8425
2005-09-30	3.968	4.221	5.0241	0.253	0.8031
2005-08-31	3.789	4.122	4.9276	0.333	0.8056
2005-07-29	3.869	4.274	5.1267	0.405	0.8527
2005-06-30	3.751	4.214	5.1286	0.463	0.9146
2005-05-31	3.924	4.369	5.3095	0.445	0.9405
2005-04-29	4.14	4.578	5.5479	0.438	0.9699
2005-03-31	4.32	4.714	5.6508	0.394	0.9368
2005-02-28	4.274	4.751	5.6946	0.477	0.9436
2005-01-31	4.212	4.714	5.6764	0.502	0.9624

2004-12-31	4.306	4.841	5.7346	0.535	0.8936
2004-11-30	4.454	4.993	5.9516	0.539	0.9586
2004-10-29	4.478	4.965	5.947	0.487	0.982
2004-09-30	4.622	5.102	6.0445	0.48	0.9425
2004-08-31	4.605	5.117	6.078	0.512	0.961
2004-07-30	4.758	5.28	6.2299	0.522	0.9499
2004-06-30	4.84	5.335	6.2643	0.495	0.9293
2004-05-31	4.777	5.306	6.2402	0.529	0.9342
2004-04-30	4.629	5.25	6.1675	0.621	0.9175
2004-03-31	4.327	5.035	5.9005	0.708	0.8655
2004-02-27	4.38	5.06	5.8625	0.68	0.8025
2004-01-30	4.527	5.172	5.9712	0.645	0.7992
2003-12-31	4.658	5.203	5.99	0.545	0.787
2003-11-28	4.84	5.337	6.136	0.497	0.799
2003-10-31	4.848	5.358	6.2209	0.51	0.8629
2003-09-30	4.562	5.147	6.1106	0.585	0.9636
2003-08-29	4.875	5.358	6.3068	0.483	0.9488
2003-07-31	4.843	5.425	6.3408	0.582	0.9158
2003-06-30	4.453	5.091	6.1065	0.638	1.0155
2003-05-30	4.414	5.012	6.0889	0.598	1.0769
2003-04-30	4.907	5.418	6.477	0.511	1.059
2003-03-31	5.083	5.554	6.6701	0.471	1.1161
2003-02-28	4.941	5.445	6.676	0.504	1.231
2003-01-31	5.015	5.468	6.651	0.453	1.183







CW-YECL-21

Reference: YECL Application, Schedules 8.2 and 8.3

Issue/sub-issue: Cost of Debt

Preamble: CW notes that for 2014 and 2015, the actual cost of debt issues in each year is lower than the forecast.

Request:

- (a) For each of 2014 and 2015, please fully explain why the actual cost of the debt issue in the respective year is lower than forecast.
- (b) For 2013, the actual and forecast cost of new debt is the same. Please confirm that, for 2013, the actual cost of new debt was known prior to the close of the proceeding, and was incorporated into the GRA.
- (c) Please provide the YECL initial forecast of new debt for 2013 that was included in the initial application for 2013.

Response:

- (a) AEY used the best information available at the time each debt rate forecast was prepared. The capital markets have been very volatile over the past while due to a large number of unexpected events that have impacted the global economy. As a result, underlying Government of Canada bond yields and credit spreads have experienced many ups and downs.
- (b) Confirmed.
- (c) The initial forecast for new debt for 2013 that was included in the original application filed on May 27, 2013 was 4.35%.

CW-YECL-22

Reference: YECL Application, Attachment 8.2, Beaver Creek RID Claim

Issue/sub-issue: RID

Preamble: CW requires information to assess the RID claim.

Request:

- (a) Please fully explain when the leak started.
- (b) Please fully explain the YECL inspection and maintenance protocol for the tank in question.
- (c) Please fully explain what YECL could have done to prevent the leak, or detect it earlier and minimize any spillage.

Response:

- (a) The fuel tank was found to be leaking April 24, 2015. The tank had started to leak at an unknown time before that date.
- (b) The tank was inspected on regular fill ups by the fuel delivery company. The local AEY employee that resided at the premises removed snow in the vicinity of the tank and visually inspected the tank. Regular maintenance of the tank would include fuel filter changes.
- (c) Prevention of the leak may have been mitigated by conversion of the heating system to a propane source; however, installation of propane also presents its own risks.

CW-YECL-23

Reference: YECL Application, Attachment 8.3, Fish Lake Claim

Issue/sub-issue: RID

Preamble: CW requires information to assess the RID claim..

Request:

- (a) Please fully explain when the issue started.
- (b) Please fully explain the YECL inspection and maintenance protocol for the ditch.
- (c) Please fully explain what YECL could have done to prevent the issue.

Response:

- (a) The issue was identified January 19th, 2015.
- (b) Remote level monitoring of Ditch No.1 water levels are obtained in real time via SCADA. Under normal operations, AEY staff performs field inspections and maintenance trips to Ditch #1 at least twice weekly, with the full length of the ditch inspected monthly. When the spillway is in use and Ditch No.1 freeboard is at or less than 0.3m, the overflow spillway is checked daily. Ditch No.1 is inspected annually by a third party to comply at a minimum with Dam Safety recommendations.
- (c) A third party engineering assessment of the failure concluded the failure mechanism (ice loading) would not normally be considered a governing design constraint given the site characteristics. The report further identified that the structure was built to appropriate design specifications and under normal operational conditions, a failure of this type should have been very unlikely. Given this unique event could not be foreseen, actions to prevent it are unknown to AEY.

CW-YECL-24

Reference: YECL Application, Table 2

Issue/sub-issue: Sales Forecasts

Preamble: In Table 2, YECL provides Actual (Normalized) sales. CW requires an understanding of how the actual results were normalized.

Request:

- (a) For each of 2008-2015, please fully explain how the actual sales were normalized. In the response please provide the normal and actual heating degree days used, the period that was used to determine normal heating degree days, and the working papers in support of the normalization.

Response:

- (a) Please refer to the table below for the details pertaining to how the actual sales were normalized. Please refer to CW-YECL-24(a) Attachment 1 for the working papers.

Year	Actual (Normalized) (MWh)	Historical UPC for Regression	Normal HDD (City of Whitehorse)
2008	269,799	15 years (1998-2012)	20 year average (1993-2012)
2009	275,425	15 years (1998-2012)	20 year average (1993-2012)
2013	313,442	15 years (2001-2015)	20 year average (1996-2015)
2014	309,961	15 years (2001-2015)	20 year average (1996-2015)
2015	314,658	15 years (2001-2015)	20 year average (1996-2015)

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Residential 2008 - 2009

	Actual					Normalized		
	UPC (kWh)	Whitehorse HDD	Customers	Monthly Energy (MWh)	Annual Energy (MWh)	UPC (kWh)	Monthly Energy (MWh)	Annual Energy (MWh)
Jan-08	1,175	1,113.8	12,628	14,840		1,164	14,705	
Feb-08	1,050	954.6	12,625	13,254		990	12,497	
Mar-08	919	734.7	12,627	11,606		944	11,924	
Apr-08	734	517.3	12,640	9,278		722	9,125	
May-08	714	307.9	12,667	9,043		721	9,132	
Jun-08	649	225.6	12,714	8,251		617	7,840	
Jul-08	663	173.4	12,723	8,440		633	8,057	
Aug-08	635	187.7	12,738	8,091		624	7,952	
Sep-08	681	318.7	12,787	8,710		679	8,688	
Oct-08	787	563.0	12,836	10,102		776	9,962	
Nov-08	977	782.5	12,778	12,487		994	12,707	
Dec-08	1,108	1,186.2	12,814	14,201	128,302	1,000	12,819	125,407
Jan-09	1,317	1,137.9	12,823	16,893		1,295	16,602	
Feb-09	1,063	955.4	12,839	13,647		1,003	12,872	
Mar-09	916	868.5	12,844	11,770		875	11,236	
Apr-09	756	515.2	12,875	9,732		745	9,590	
May-09	710	331.2	12,942	9,194		706	9,135	
Jun-09	627	144.1	12,969	8,126		635	8,234	
Jul-09	588	62.5	12,962	7,622		613	7,948	
Aug-09	579	158.3	12,977	7,512		583	7,561	
Sep-09	719	306.1	12,986	9,337		724	9,397	
Oct-09	777	541.8	13,032	10,125		777	10,120	
Nov-09	955	781.5	13,025	12,437		973	12,668	
Dec-09	1,087	943.4	13,041	14,174	130,569	1,100	14,346	129,710

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.892180248
R Square	0.795985595
Adjusted R Square	0.794839446
Standard Error	83.81615614
Observations	180

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	4878876.856	4878876.856	694.487409	2.42586E-63
Residual	178	1250476.349	7025.14803		
Total	179	6129353.205			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	545.717654	12.12608351	45.00361995	3.528E-99	521.7882725	569.6470354	521.7882725	569.6470354
WH-HDD	0.498888781	0.018930913	26.35312902	2.4259E-63	0.46153088	0.536246682	0.46153088	0.536246682

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Commercial 2008 - 2009

	Actual					Normalized		
	UPC (kWh)	Whitehorse HDD	Customers	Monthly Energy (MWh)	Annual Energy (MWh)	UPC (kWh)	Monthly Energy (MWh)	Annual Energy (MWh)
Jan-08	5,196	1,113.8	2,554	13,271		5,169	13,202	
Feb-08	5,125	954.6	2,549	13,063		4,973	12,677	
Mar-08	4,740	734.7	2,544	12,059		4,804	12,221	
Apr-08	4,354	517.3	2,578	11,224		4,323	11,145	
May-08	3,918	307.9	2,617	10,253		3,936	10,300	
Jun-08	4,206	225.6	2,653	11,159		4,124	10,942	
Jul-08	4,002	173.4	2,639	10,561		3,926	10,360	
Aug-08	4,387	187.7	2,647	11,612		4,359	11,539	
Sep-08	3,922	318.7	2,662	10,440		3,917	10,428	
Oct-08	4,425	563.0	2,649	11,721		4,397	11,648	
Nov-08	4,973	782.5	2,552	12,690		5,016	12,801	
Dec-08	5,334	1,186.2	2,559	13,651	141,704	5,062	12,953	140,216
Jan-09	5,384	1,137.9	2,569	13,831		5,326	13,684	
Feb-09	5,104	955.4	2,575	13,144		4,952	12,751	
Mar-09	4,815	868.5	2,588	12,461		4,710	12,189	
Apr-09	4,169	515.2	2,601	10,843		4,141	10,771	
May-09	4,163	331.2	2,637	10,979		4,152	10,948	
Jun-09	3,784	144.1	2,646	10,012		3,805	10,067	
Jul-09	3,956	62.5	2,655	10,504		4,020	10,673	
Aug-09	4,035	158.3	2,660	10,733		4,044	10,758	
Sep-09	3,933	306.1	2,672	10,508		3,944	10,539	
Oct-09	4,267	541.8	2,667	11,380		4,266	11,378	
Nov-09	5,112	781.5	2,647	13,533		5,157	13,651	
Dec-09	5,350	943.4	2,645	14,149	142,076	5,383	14,238	141,646

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.800933397
R Square	0.641494306
Adjusted R Square	0.639480229
Standard Error	312.8815606
Observations	180

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	31180041.46	31180041.46	318.505363	1.66469E-41
Residual	178	17425287.03	97894.87096		
Total	179	48605328.49			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3723.764711	45.26606932	82.26392896	1.44E-143	3634.437515	3813.091907	3634.437515	3813.091907
WH-HDD	1.261194748	0.070668159	17.84671856	1.6647E-41	1.121739553	1.400649942	1.121739553	1.400649942

Whitehorse HDD
Heating Degree Day Actuals
Degree Days Below 18.0 °C

MONTH	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	20 year Normal HDD (1993-2012)
JAN	812.3	1,119.6	1,085.4	1,020.1	1,556.4	1,185.7	1,165.7	1,183.1	1,082.9	722.7	935.6	989.1	1,257.9	1,165.8	1,096.2	912.0	1,113.8	1,137.9	991.1	1,010.2	1,118.1	1,092.5
FEB	859.8	841.7	1,124.5	840.1	835.8	656.5	719.1	976.4	735.2	864.1	824.6	756.6	697.2	795.2	821.3	998.8	954.6	955.4	679.2	905.6	707.5	834.5
MAR	660.7	693.4	653.9	880.0	805.8	855.4	756.6	734.0	659.2	765.3	921.1	834.5	753.5	613.7	906.3	954.2	734.7	868.5	656.0	901.7	756.2	785.2
APR	536.3	417.3	430.8	439.9	526.0	484.0	458.6	508.8	515.6	506.8	653.3	514.3	466.6	453.3	519.1	511.9	517.3	515.2	461.2	511.2	450.6	493.1
MAY	378.3	244.1	320.9	250.7	357.3	331.1	270.6	391.9	382.0	390.4	361.6	363.7	272.5	256.6	346.9	322.1	307.9	331.2	292.0	296.2	350.8	322.0
JUN	176.8	132.5	166.2	139.0	193.6	148.9	119.5	153.9	172.5	167.3	175.6	192.8	83.7	154.4	173.1	140.5	225.6	144.1	171.9	161.0	200.0	160.8
JUL	123.8	96.8	83.7	96.6	124.9	92.8	111.6	108.6	142.1	139.6	130.9	84.4	74.2	132.6	118.4	102.3	173.4	62.5	117.3	127.8	140.1	113.0
AUG	176.2	158.0	69.6	198.3	227.3	130.0	189.2	145.7	219.9	139.6	182.8	180.6	101.7	150.8	201.6	154.2	187.7	158.3	146.2	217.9	157.9	165.9
SEP	461.1	279.2	334.9	226.5	362.6	282.1	327.8	311.2	354.2	309.0	314.4	359.2	367.5	299.3	295.7	308.4	318.7	306.1	332.4	328.5	287.2	315.2
OCT	613.1	478.7	507.0	524.9	679.9	641.0	557.7	499.8	539.2	573.4	444.3	466.7	540.5	534.6	520.5	543.7	563.0	541.8	520.4	513.3	631.4	541.1
NOV	677.5	732.2	935.9	894.4	975.0	694.0	792.3	792.5	691.2	818.0	582.6	874.6	719.8	762.6	1,162.2	724.6	782.5	781.5	717.6	936.3	969.6	817.0
DEC	1,150.6	825.6	1,028.9	1,048.6	1,155.8	762.0	1,051.8	844.0	977.8	1,094.6	845.2	911.6	899.5	794.4	824.3	1,069.5	1,186.2	943.4	1,162.5	775.1	1,196.8	969.9
TOTAL	6,626.5	6,019.1	6,741.7	6,559.1	7,800.4	6,263.5	6,520.5	6,649.9	6,471.8	6,490.8	6,372.0	6,528.1	6,234.6	6,113.3	6,985.6	6,742.2	7,065.4	6,745.9	6,247.8	6,684.8	6,966.2	6,610.1

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Residential 2013- 2015

	Actual					Normalized		
	UPC (kWh)	Whitehorse HDD	Customers	Monthly Energy (MWh)	Annual Energy (MWh)	UPC (kWh)	Monthly Energy (MWh)	Annual Energy (MWh)
Jan-13	1,247	952.0	14,120	17,612		1,304	18,410	
Feb-13	963	665.4	14,086	13,570		1,043	14,686	
Mar-13	924	851.1	14,129	13,061		894	12,634	
Apr-13	972	639.9	14,144	13,745		903	12,774	
May-13	766	294.0	14,163	10,855		779	11,038	
Jun-13	579	112.4	14,175	8,208		604	8,562	
Jul-13	640	92.5	14,195	9,089		652	9,250	
Aug-13	574	98.9	14,194	8,154		609	8,645	
Sep-13	686	264.3	14,215	9,757		714	10,148	
Oct-13	801	501.4	14,279	11,438		821	11,724	
Nov-13	986	865.6	14,302	14,095		956	13,671	
Dec-13	1,340	1,144.7	14,325	19,196	148,780	1,251	17,921	149,464
Jan-14	1,144	745.8	14,345	16,411		1,307	18,749	
Feb-14	1,063	992.4	14,343	15,253		974	13,967	
Mar-14	1,067	855.1	14,291	15,250		1,035	14,788	
Apr-14	785	499.8	14,358	11,271		789	11,325	
May-14	689	269.5	14,358	9,886		714	10,254	
Jun-14	658	200.5	14,353	9,440		637	9,145	
Jul-14	615	98.0	14,411	8,865		624	8,988	
Aug-14	554	144.0	14,429	7,993		565	8,156	
Sep-14	728	307.1	14,468	10,531		733	10,610	
Oct-14	842	515.6	14,498	12,202		854	12,386	
Nov-14	840	772.8	14,513	12,186		858	12,452	
Dec-14	1,235	854.4	14,541	17,964	147,253	1,296	18,851	149,671
Jan-15	1,142	927.0	14,551	16,617		1,211	17,627	
Feb-15	1,106	851.4	14,559	16,102		1,089	15,857	
Mar-15	959	671.3	14,584	13,980		1,021	14,894	
Apr-15	784	453.5	14,598	11,446		812	11,850	
May-15	643	192.9	14,599	9,391		708	10,342	
Jun-15	650	127.2	14,589	9,488		668	9,741	
Jul-15	582	115.7	14,608	8,507		582	8,497	
Aug-15	610	183.2	14,623	8,922		601	8,791	
Sep-15	688	332.7	14,635	10,069		680	9,955	
Oct-15	804	469.8	14,706	11,819		840	12,354	
Nov-15	996	759.2	14,752	14,694		1,021	15,067	
Dec-15	1,190	947.9	14,768	17,570	148,605	1,202	17,757	152,733

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.86620452
R Square	0.75031027
Adjusted R Square	0.74890752
Standard Error	98.78301
Observations	180

ANOVA

	df	SS	MS	F	Significance F
Regression	1	5219449.849	5219449.849	534.884753	1.6083E-55
Residual	178	1736938.786	9758.083069		
Total	179	6956388.635			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	551.00915	14.20745555	38.78309865	9.6835E-89	522.972429	579.0458717	522.9724291	579.0458717
WH-HDD	0.51668918	0.022340827	23.12757559	1.6083E-55	0.47260221	0.560776137	0.472602213	0.560776137

**ATCO Electric Yukon
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Commercial 2013- 2015

	Actual					Normalized		
	UPC (kWh)	Whitehorse HDD	Customers	Monthly Energy (MWh)	Annual Energy (MWh)	UPC (kWh)	Monthly Energy (MWh)	Annual Energy (MWh)
Jan-13	5,277	952.0	2,869	15,140		5,424	15,560	
Feb-13	4,556	665.4	2,866	13,058		4,762	13,647	
Mar-13	4,704	851.1	2,872	13,511		4,626	13,286	
Apr-13	4,899	639.9	2,891	14,163		4,721	13,648	
May-13	4,025	294.0	2,939	11,830		4,059	11,928	
Jun-13	3,541	112.4	2,953	10,456		3,606	10,647	
Jul-13	4,233	92.5	2,962	12,538		4,262	12,625	
Aug-13	3,907	98.9	2,953	11,536		3,996	11,801	
Sep-13	4,239	264.3	2,958	12,538		4,310	12,749	
Oct-13	4,451	501.4	2,957	13,162		4,503	13,316	
Nov-13	4,936	865.6	2,909	14,358		4,859	14,134	
Dec-13	5,896	1,144.7	2,889	17,032	159,322	5,665	16,365	159,708
Jan-14	4,723	745.8	2,906	13,725		5,146	14,954	
Feb-14	5,210	992.4	2,904	15,129		4,977	14,454	
Mar-14	4,767	855.1	2,906	13,852		4,683	13,608	
Apr-14	4,220	499.8	2,927	12,351		4,229	12,379	
May-14	3,626	269.5	2,940	10,661		3,693	10,856	
Jun-14	3,819	200.5	2,958	11,296		3,766	11,138	
Jul-14	3,876	98.0	2,959	11,470		3,898	11,535	
Aug-14	3,658	144.0	2,949	10,788		3,687	10,874	
Sep-14	4,254	307.1	2,957	12,581		4,269	12,622	
Oct-14	4,360	515.6	2,967	12,936		4,393	13,033	
Nov-14	4,609	772.8	2,943	13,564		4,656	13,704	
Dec-14	5,560	854.4	2,942	16,357	154,709	5,718	16,823	155,981
Jan-15	5,131	927.0	2,932	15,045		5,311	15,572	
Feb-15	4,781	851.4	2,945	14,080		4,737	13,952	
Mar-15	4,780	671.3	2,955	14,125		4,942	14,605	
Apr-15	4,029	453.5	2,970	11,967		4,101	12,180	
May-15	3,515	192.9	2,983	10,485		3,684	10,989	
Jun-15	3,874	127.2	3,006	11,646		3,919	11,781	
Jul-15	3,805	115.7	3,021	11,496		3,804	11,491	
Aug-15	3,790	183.2	3,038	11,515		3,767	11,444	
Sep-15	3,915	332.7	3,010	11,784		3,895	11,723	
Oct-15	4,160	469.8	3,025	12,585		4,254	12,870	
Nov-15	5,007	759.2	2,994	14,990		5,072	15,187	
Dec-15	5,248	947.9	2,978	15,629	155,346	5,281	15,727	157,521

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.80042944							
R Square	0.64068728							
Adjusted R Square	0.63866867							
Standard Error	332.530544							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	35095917.33	35095917.33	317.390201	2.0348E-41			
Residual	178	19682628.12	110576.5624					
Total	179	54778545.45						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3738.37346	47.82616887	78.1658566	1.006E-139	3643.99421	3832.752705	3643.99421	3832.752705
WH-HDD	1.33981643	0.075205316	17.81544837	2.0348E-41	1.19140769	1.488225159	1.191407692	1.488225159

Whitehorse HDD
Heating Degree Day Actuals
Degree Days Below 18.0 °C

MONTH	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	20 year Normal HDD (1996-2015)
JAN	812.3	1,119.6	1,085.4	1,020.1	1,530.1	1,185.7	1,165.7	1,183.1	1,082.9	724.6	938.1	992.6	1,254.0	1,165.8	1,096.2	912.0	1,113.8	1,137.9	991.1	1,010.2	1,118.1	952.0	745.8	927.0	1,061.3
FEB	859.8	841.7	1,124.5	840.1	835.8	656.5	719.1	976.4	735.2	864.1	824.6	756.6	697.2	795.2	821.3	998.8	954.6	955.4	679.2	905.6	691.7	665.4	992.4	851.4	818.8
MAR	660.7	693.4	653.9	880.0	805.8	855.4	756.6	734.0	659.2	765.3	921.0	832.2	753.5	613.7	906.3	954.2	734.7	868.5	656.0	901.7	756.2	851.1	855.1	671.3	792.6
APR	536.3	417.3	430.8	439.9	526.0	484.0	458.6	508.8	515.6	505.3	653.3	514.3	466.6	453.3	519.1	486.4	517.3	515.2	461.2	511.2	450.6	639.9	499.8	453.5	507.0
MAY	378.3	244.1	320.9	250.7	357.3	331.1	270.6	391.9	382.0	390.4	361.6	363.7	272.5	256.6	346.9	322.1	307.9	331.2	292.0	296.4	350.8	294.0	269.5	192.9	319.1
JUN	176.8	132.5	166.2	139.0	193.6	148.9	119.5	153.9	172.5	167.3	175.6	192.8	83.7	154.4	173.1	140.5	225.6	144.1	171.9	161.0	195.1	112.4	200.5	127.2	160.7
JUL	123.8	96.8	83.7	96.6	124.9	92.8	111.6	108.6	142.1	139.6	130.9	84.2	74.2	132.6	118.4	102.3	173.4	62.5	117.3	127.8	140.1	92.5	98.0	115.7	114.5
AUG	176.2	158.0	69.6	198.3	227.3	130.0	189.2	145.7	219.7	139.6	182.8	180.6	101.7	150.8	201.6	154.2	187.7	158.3	146.2	217.9	157.9	98.9	144.0	183.2	165.9
SEP	461.1	279.2	334.9	226.5	362.6	282.1	327.8	311.2	354.2	309.0	314.4	359.2	367.5	299.3	295.7	308.4	318.7	306.1	332.4	328.5	271.0	264.3	307.1	332.7	317.6
OCT	613.1	478.7	507.0	524.9	679.9	641.0	557.7	499.8	537.2	573.4	444.3	466.7	540.5	534.6	520.5	543.7	563.0	541.8	520.4	513.3	639.3	501.4	515.6	469.8	540.2
NOV	677.5	732.2	935.9	894.4	975.0	685.8	792.3	792.5	694.2	818.0	582.6	874.6	719.8	762.6	1,162.2	724.6	782.5	781.5	717.6	931.7	969.6	865.6	772.8	759.2	808.2
DEC	1,150.6	825.6	1,028.9	1,048.6	1,155.8	762.0	1,051.8	844.0	973.0	1,094.6	845.1	911.6	899.5	794.4	824.3	1,069.5	1,186.2	955.2	1,162.5	775.1	1,196.8	1,144.7	854.4	947.9	972.4
TOTAL	6,626.5	6,019.1	6,741.7	6,559.1	7,774.1	6,255.3	6,520.5	6,649.9	6,467.8	6,491.2	6,374.3	6,529.1	6,230.7	6,113.3	6,985.6	6,716.7	7,065.4	6,757.7	6,247.8	6,680.4	6,937.2	6,482.2	6,255.0	6,031.8	6,578.3

CW-YECL-25

Reference: YECL Application, starting on page 2-5 (PDF 19)

Issue/sub-issue: Sales Forecasts

Preamble: YECL indicates that it has revised its forecast methodology to use a 3 year

Request:

- (a) Please provide the working papers used in the YECL analysis in Excel format with formulae and links intact.
- (b) Please provide a revised set of analysis similar to the analysis in the application, in Excel format with formulae and links intact, using the old methodology for regression and normalization.

Response:

- (a) Please refer to YUB-YECL-7(b) Attachment 1 and YUB-YECL-7(c) Attachment 1 for the Residential working papers. Please refer to YUB-YECL-8(b) Attachment 1 for the Commercial working papers.
- (b) Please refer to CW-YECL-25(b) Attachment 1 for the Residential working papers and CW-YECL-25(b) Attachment 2 for the Commercial working papers. Please refer to response YUB-YECL-7 for further information regarding the change in methodology.

ATCO Electric Yukon
2016 - 2017 General Rate Application

Section 2
Attachment 1

Whitehorse (Includes Takhini & Deep Creek)

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Annual Normalized		Regression Output:																																																			
	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)																																																				
Jan-95	1476.93		1020.10	1,499.8	SUMMARY OUTPUT Regression Statistics Multiple R0.86132339 R Square0.741877983 Adjusted R Square0.740427859 Standard Error108.1813099 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>5987312.219</td><td>5987312.219</td><td>511.5963468</td><td>3.10848E-54</td></tr><tr><td>Residual</td><td>178</td><td>2083168.853</td><td>11703.1958</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>8070481.072</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>590.4845694</td><td>15.559165</td><td>37.95091636</td><td>3.04032E-87</td><td>559.7804106</td><td>621.1887283</td><td>559.7804106</td><td>621.1887283</td></tr><tr><td>WH-HDD</td><td>0.553392095</td><td>0.024466353</td><td>22.61849568</td><td>3.10848E-54</td><td>0.505110662</td><td>0.601673529</td><td>0.505110662</td><td>0.601673529</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	5987312.219	5987312.219	511.5963468	3.10848E-54	Residual	178	2083168.853	11703.1958			Total	179	8070481.072					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	590.4845694	15.559165	37.95091636	3.04032E-87	559.7804106	621.1887283	559.7804106	621.1887283	WH-HDD	0.553392095	0.024466353	22.61849568	3.10848E-54	0.505110662	0.601673529	0.505110662	0.601673529
	df	SS	MS	F		Significance F																																																		
Regression	1	5987312.219	5987312.219	511.5963468		3.10848E-54																																																		
Residual	178	2083168.853	11703.1958																																																					
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	590.4845694	15.559165	37.95091636	3.04032E-87		559.7804106	621.1887283	559.7804106	621.1887283																																															
WH-HDD	0.553392095	0.024466353	22.61849568	3.10848E-54		0.505110662	0.601673529	0.505110662	0.601673529																																															
Feb-95	1132.87		840.10	1,121.1																																																				
Mar-95	1242.26		880.00	1,193.9																																																				
Apr-95	1015.26		439.90	1,052.4																																																				
May-95	875.42		250.70	913.3																																																				
Jun-95	741.39		139.00	753.4																																																				
Jul-95	658.74		96.60	668.6																																																				
Aug-95	627.06		198.30	609.1																																																				
Sep-95	724.72		226.50	775.1																																																				
Oct-95	794.82		524.90	803.3																																																				
Nov-95	1006.09		894.40	958.4																																																				
Dec-95	1262.34	11,557.9	1048.60	1,220.2		11,568.5																																																		
Jan-96	1478.03		1530.10	1,218.6																																																				
Feb-96	1580.65		835.80	1,571.3																																																				
Mar-96	1221.08		805.80	1,213.8																																																				
Apr-96	1029.16		526.00	1,018.6																																																				
May-96	877.46		357.30	856.3																																																				
Jun-96	759.53		193.60	741.3																																																				
Jul-96	677.12		124.90	671.4																																																				
Aug-96	642.81		227.30	608.8																																																				
Sep-96	741.13		362.60	716.2																																																				
Oct-96	856.20		679.90	778.9																																																				
Nov-96	1091.87		975.00	999.6																																																				
Dec-96	1222.22	12,177.3	1155.80	1,120.7	11,515.5																																																			
Jan-97	1635.47		1185.70	1,566.6																																																				
Feb-97	1196.59		656.50	1,286.4																																																				
Mar-97	1062.63		855.40	1,027.9																																																				
Apr-97	998.45		484.00	1,011.2																																																				
May-97	834.94		331.10	828.3																																																				
Jun-97	746.77		148.90	753.3																																																				
Jul-97	642.88		92.80	654.9																																																				
Aug-97	613.18		130.00	633.0																																																				
Sep-97	678.70		282.10	698.4																																																				
Oct-97	799.65		641.00	743.9																																																				
Nov-97	945.18		685.80	1,012.9																																																				
Dec-97	954.27	11,108.7	762.00	1,070.7	11,287.5																																																			
Jan-98	1332.36		1165.70	1,274.6																																																				
Feb-98	1069.97		719.10	1,125.2																																																				
Mar-98	1026.66		756.60	1,046.6																																																				
Apr-98	901.48		458.60	928.3																																																				
May-98	786.22		270.60	813.0																																																				
Jun-98	695.21		119.50	718.0																																																				
Jul-98	626.59		111.60	628.2																																																				
Aug-98	603.53		189.20	590.6																																																				
Sep-98	704.88		327.80	699.2																																																				
Oct-98	779.88		557.70	770.2																																																				
Nov-98	921.51		792.30	930.3																																																				
Dec-98	969.68	10,417.9	1051.80	925.8	10,449.9																																																			
Jan-99	1381.94		1183.10	1,314.6																																																				
Feb-99	1163.43		976.40	1,076.2																																																				
Mar-99	1039.50		734.00	1,071.9																																																				
Apr-99	942.95		508.80	942.0																																																				
May-99	810.59		391.90	770.3																																																				
Jun-99	753.53		153.90	757.3																																																				
Jul-99	645.54		108.60	648.8																																																				
Aug-99	609.72		145.70	620.9																																																				
Sep-99	696.60		311.20	700.1																																																				
Oct-99	762.59		499.80	784.9																																																				
Nov-99	880.52		792.50	889.2																																																				
Dec-99	992.76	10,679.7	844.00	1,063.8	10,640.1																																																			
Jan-00	1263.32		1082.90	1,251.4																																																				
Feb-00	1034.52		735.20	1,080.8																																																				
Mar-00	917.08		659.20	990.9																																																				
Apr-00	853.01		515.60	848.2																																																				
May-00	845.33		382.00	810.5																																																				
Jun-00	730.43		172.50	723.9																																																				
Jul-00	655.24		142.10	640.0																																																				
Aug-00	619.13		219.70	589.3																																																				
Sep-00	732.97		354.20	712.7																																																				
Oct-00	786.13		537.20	787.8																																																				
Nov-00	883.14		694.20	946.2																																																				
Dec-00	939.60	10,259.9	973.00	939.3	10,321.0																																																			

ATCO Electric Yukon
2016 - 2017 General Rate Application

Section 2
Attachment 1

Whitehorse (Includes Takhini & Deep Creek)

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)	MHDD	UPC (kWh)	Normalized	
Jan-01	1183.13		724.60	1,369.5		
Feb-01	937.13		864.10	912.1		
Mar-01	986.22		765.30	1,001.3		
Apr-01	866.67		505.30	867.6		
May-01	814.97		390.40	775.5		
Jun-01	762.11		167.30	758.4		
Jul-01	656.11		139.60	642.2		
Aug-01	597.47		139.60	612.0		
Sep-01	659.92		309.00	664.7		
Oct-01	753.29		573.40	734.9		
Nov-01	903.15		818.00	897.7		
Dec-01	1055.12	10,175.3	1094.60	987.5	10,223.5	
Jan-02	1221.37		938.10	1,289.6		
Feb-02	1011.76		824.60	1,008.6		
Mar-02	996.34		921.00	925.3		
Apr-02	988.21		653.30	907.3		
May-02	797.31		361.60	773.8		
Jun-02	705.67		175.60	697.4		
Jul-02	641.57		130.90	632.5		
Aug-02	647.02		182.80	637.7		
Sep-02	679.06		314.40	680.8		
Oct-02	757.23		444.30	810.3		
Nov-02	871.98		582.60	996.8		
Dec-02	897.18	10,214.7	845.10	967.6	10,327.6	
Jan-03	1200.32		992.60	1,238.4		
Feb-03	994.05		756.60	1,028.5		
Mar-03	983.76		832.20	961.8		
Apr-03	891.05		514.30	887.0		
May-03	789.20		363.70	764.5		
Jun-03	748.15		192.80	730.4		
Jul-03	656.89		84.20	673.6		
Aug-03	616.58		180.60	608.4		
Sep-03	708.55		359.20	685.5		
Oct-03	725.63		466.70	766.3		
Nov-03	909.67		874.60	872.9		
Dec-03	1072.36	10,296.2	911.60	1,106.0	10,323.4	
Jan-04	1245.10		1254.00	1,138.5		
Feb-04	1091.55		697.20	1,158.9		
Mar-04	922.88		753.50	944.5		
Apr-04	947.67		466.60	970.0		
May-04	750.59		272.50	776.4		
Jun-04	710.22		83.70	752.8		
Jul-04	666.56		74.20	688.8		
Aug-04	606.50		101.70	642.0		
Sep-04	668.84		367.50	641.2		
Oct-04	760.63		540.50	760.5		
Nov-04	897.01		719.80	946.0		
Dec-04	1013.64	10,281.2	899.50	1,054.0	10,473.5	
Jan-05	1276.25		1165.80	1,218.4		
Feb-05	1106.14		795.20	1,119.2		
Mar-05	921.34		613.70	1,020.3		
Apr-05	904.45		453.30	934.2		
May-05	733.30		256.60	767.9		
Jun-05	704.08		154.40	707.6		
Jul-05	658.93		132.60	648.9		
Aug-05	620.62		150.80	629.0		
Sep-05	740.58		299.30	750.7		
Oct-05	732.44		534.60	735.5		
Nov-05	919.63		762.60	944.9		
Dec-05	965.11	10,282.9	794.40	1,063.6	10,540.2	
Jan-06	1193.95		1096.20	1,174.7		
Feb-06	1042.52		821.30	1,041.1		
Mar-06	1070.39		906.30	1,007.5		
Apr-06	931.76		519.10	925.1		
May-06	800.35		346.90	785.0		
Jun-06	725.45		173.10	718.6		
Jul-06	702.93		118.40	700.8		
Aug-06	633.84		201.60	614.1		
Sep-06	734.88		295.70	747.0		
Oct-06	793.49		520.50	804.4		
Nov-06	936.95		1162.20	741.1		
Dec-06	1128.79	10,695.3	824.30	1,210.8	10,469.9	

ATCO Electric Yukon
2016 - 2017 General Rate Application

Section 2
Attachment 1

Whitehorse (Includes Takhini & Deep Creek)

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)	MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-07	1244.03		912.00	1,326.7		
Feb-07	1049.31		998.80	949.7		
Mar-07	1137.25		954.20	1,047.8		
Apr-07	983.99		486.40	995.4		
May-07	733.77		322.10	732.1		
Jun-07	718.35		140.50	729.5		
Jul-07	701.13		102.30	707.9		
Aug-07	596.25		154.20	602.7		
Sep-07	687.60		308.40	692.7		
Oct-07	753.17		543.70	751.2		
Nov-07	921.03		724.60	967.3		
Dec-07	992.79	10,518.7	1069.50	939.1	10,442.1	
Jan-08	1295.99		1113.80	1,267.0		
Feb-08	1183.62		954.60	1,108.5		
Mar-08	1009.39		734.70	1,041.4		
Apr-08	940.13		517.30	934.4		
May-08	786.95		307.90	793.1		
Jun-08	694.84		225.60	658.9		
Jul-08	679.41		173.40	646.8		
Aug-08	699.52		187.70	687.4		
Sep-08	698.92		318.70	698.3		
Oct-08	730.77		563.00	718.2		
Nov-08	982.93		782.50	997.2		
Dec-08	1009.35	10,711.8	1186.20	891.0	10,442.3	
Jan-09	1525.48		1137.90	1,483.1		
Feb-09	1119.51		955.40	1,043.9		
Mar-09	1090.94		868.50	1,048.9		
Apr-09	942.64		515.20	938.1		
May-09	770.67		331.20	764.0		
Jun-09	702.30		144.10	711.5		
Jul-09	700.82		62.50	729.6		
Aug-09	625.94		158.30	630.1		
Sep-09	718.09		306.10	724.5		
Oct-09	770.04		541.80	769.1		
Nov-09	951.00		781.50	965.8		
Dec-09	1010.34	10,927.8	955.20	1,019.9	10,828.5	
Jan-10	1342.75		991.10	1,381.6		
Feb-10	1009.95		679.20	1,087.2		
Mar-10	937.90		656.00	1,013.5		
Apr-10	942.80		461.20	968.1		
May-10	793.20		292.00	808.2		
Jun-10	717.29		171.90	711.1		
Jul-10	684.00		117.30	682.4		
Aug-10	626.22		146.20	637.1		
Sep-10	719.18		332.40	711.0		
Oct-10	820.00		520.40	831.0		
Nov-10	902.26		717.60	952.4		
Dec-10	1054.78	10,550.3	1162.50	949.6	10,733.2	
Jan-11	1433.56		1010.20	1,461.9		
Feb-11	1127.28		905.60	1,079.3		
Mar-11	1254.08		901.70	1,193.7		
Apr-11	953.45		511.20	951.1		
May-11	890.97		296.40	903.5		
Jun-11	742.16		161.00	742.0		
Jul-11	675.92		127.80	668.5		
Aug-11	646.51		217.90	617.7		
Sep-11	736.23		328.50	730.2		
Nov-11	830.25		513.30	845.1		
Nov-11	941.85		931.70	873.5		
Dec-11	1135.08	11,367.3	775.10	1,244.3	11,310.8	
Jan-12	1354.63		1118.10	1,323.2		
Feb-12	1168.95		691.70	1,239.3		
Mar-12	1096.48		756.20	1,116.6		
Apr-12	928.99		450.60	960.2		
May-12	833.15		350.80	815.6		
Jun-12	768.37		195.10	749.3		
Jul-12	707.34		140.10	693.2		
Aug-12	676.24		157.90	680.7		
Sep-12	693.75		271.00	719.5		
Oct-12	801.03		639.30	746.2		
Nov-12	1009.67		969.60	920.4		
Dec-12	1260.62	11,299.2	1196.80	1,136.5	11,100.6	

ATCO Electric Yukon
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Attachment 1

Whitehorse (Includes Takhini & Deep Creek)

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)	MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-13	1,539.9		952.00	1,600.4		
Feb-13	1,152.3		665.40	1,237.2		
Mar-13	1,075.4		851.10	1,043.0		
Apr-13	1,092.7		639.90	1,019.1		
May-13	843.2		294.00	857.0		
Jun-13	743.9		112.40	770.6		
Jul-13	667.8		92.50	680.0		
Aug-13	643.5		98.90	680.5		
Sep-13	664.6		264.30	694.1		
Oct-13	762.8		501.40	784.3		
Nov-13	920.2		865.60	888.5		
Dec-13	1,161.1	11,267.6	1,144.70	1,065.8	11,320.8	
Jan-14	1,467.1		745.80	1,641.7		
Feb-14	1,067.5		992.40	971.4		
Mar-14	1,217.3		855.10	1,182.8		
Apr-14	949.3		499.80	953.2		
May-14	838.2		269.50	865.6		
Jun-14	718.4		200.50	696.4		
Jul-14	687.6		98.00	696.8		
Aug-14	574.7		144.00	586.8		
Sep-14	738.8		307.10	744.6		
Oct-14	768.1		515.60	781.8		
Nov-14	901.6		772.80	921.2		
Dec-14	1,070.2	10,998.9	854.40	1,135.5	11,177.8	
Jan-15	1,414.9		927.00	1,489.2		
Feb-15	1,235.3		851.40	1,217.2		
Mar-15	1,043.4		671.30	1,110.6		
Apr-15	952.6		453.50	982.3		
May-15	780.9		192.90	850.7		
Jun-15	647.9		127.20	666.4		
Jul-15	629.0		115.70	628.3		
Aug-15	606.6		183.20	597.0		
Sep-15	743.5		332.70	735.1		
Oct-15	786.2		469.80	825.1		
Nov-15	930.3		759.20	957.4		
Dec-15	1,105.8	10,876.2	947.90	1,119.4	11,178.7	
Jan-16	1383.1		827.6	1,512.4		
Feb-16	1061.6		688.0	1,134.0		
Mar-16	1026.0		611.6	1,126.2		
Apr-16	976.1					
May-16	845.3					
Jun-16	662.2					
Jul-16	624.3					
Aug-16	593.3					
Sep-16	730.5					
Oct-16	819.9					
Nov-16	951.4					
Dec-16	1112.3	10,786.0			11,087.9	
Jan-17	1502.9					
Feb-17	1126.8					
Mar-17	1119.1					
Apr-17	969.9					
May-17	840.0					
Jun-17	658.0					
Jul-17	620.4					
Aug-17	589.6					
Sep-17	725.9					
Oct-17	814.8					
Nov-17	945.4					
Dec-17	1105.3	11,018.1			11,018.1	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (11,178.7 / 11,320.8) ^ (1/2) - 1 = **-0.6%**

Note: January, February and March 2016 have been updated to include actuals.

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Carmacks

Residential	Annual		(Whitehorse)	Annual	
	Actual / Forecast	UPC (kWh)		Normalized	Normalized
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)
Jan-95	1364.6		1020.10	1,393.2	
Feb-95	936.0		840.10	921.2	
Mar-95	959.8		880.00	899.1	
Apr-95	885.4		439.90	932.0	
May-95	650.0		250.70	697.5	
Jun-95	515.1		139.00	530.1	
Jul-95	591.6		96.60	604.0	
Aug-95	570.7		198.30	548.2	
Sep-95	687.2		226.50	750.4	
Oct-95	714.5		524.90	725.2	
Nov-95	906.4		894.40	846.5	
Dec-95	1172.7	9,953.9	1048.60	1,119.8	9,967.3
Jan-96	1477.4		1530.10	1,152.0	
Feb-96	1332.9		835.80	1,321.1	
Mar-96	927.3		805.80	918.2	
Apr-96	797.9		526.00	784.7	
May-96	692.6		357.30	666.1	
Jun-96	702.3		193.60	679.5	
Jul-96	577.1		124.90	569.9	
Aug-96	650.6		227.30	607.9	
Sep-96	657.5		362.60	626.3	
Oct-96	796.5		679.90	699.6	
Nov-96	1149.2		975.00	1,033.4	
Dec-96	955.6	10,717.1	1155.80	828.3	9,886.8
Jan-97	1644.5		1185.70	1,558.1	
Feb-97	1182.4		656.50	1,295.1	
Mar-97	874.2		855.40	830.6	
Apr-97	840.3		484.00	856.2	
May-97	848.9		331.10	840.5	
Jun-97	603.7		148.90	611.9	
Jul-97	617.8		92.80	632.8	
Aug-97	670.2		130.00	695.1	
Sep-97	662.9		282.10	687.6	
Oct-97	783.2		641.00	713.2	
Nov-97	952.7		685.80	1,037.7	
Dec-97	914.3	10,595.0	762.00	1,060.4	10,819.2
Jan-98	1347.4		1165.70	1,275.0	
Feb-98	914.8		719.10	984.0	
Mar-98	851.0		756.60	875.9	
Apr-98	789.2		458.60	822.8	
May-98	794.1		270.60	827.8	
Jun-98	547.1		119.50	575.7	
Jul-98	607.1		111.60	609.1	
Aug-98	705.3		189.20	689.1	
Sep-98	667.6		327.80	660.5	
Oct-98	891.7		557.70	879.5	
Nov-98	847.9		792.30	858.9	
Dec-98	981.3	9,944.4	1051.80	926.2	9,984.5
Jan-99	1435.1		1183.10	1,350.6	
Feb-99	997.2		976.40	887.8	
Mar-99	878.5		734.00	919.1	
Apr-99	933.3		508.80	932.0	
May-99	735.2		391.90	684.7	
Jun-99	592.8		153.90	597.5	
Jul-99	714.3		108.60	718.4	
Aug-99	570.6		145.70	584.6	
Sep-99	733.6		311.20	738.0	
Oct-99	848.5		499.80	876.6	
Nov-99	918.7		792.50	929.6	
Dec-99	943.6	10,301.4	844.00	1,032.8	10,251.7
Jan-00	1393.3		1082.90	1,378.4	
Feb-00	907.6		735.20	965.6	
Mar-00	833.0		659.20	925.6	
Apr-00	818.2		515.60	812.3	
May-00	807.8		382.00	764.1	
Jun-00	726.0		172.50	717.8	
Jul-00	615.7		142.10	596.5	
Aug-00	625.2		219.70	587.9	
Sep-00	855.1		354.20	829.7	
Oct-00	808.9		537.20	810.9	
Nov-00	886.9		694.20	966.0	
Dec-00	1094.8	10,372.6	973.00	1,094.4	10,449.3

Regression Output:						
SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.833315787					
R Square	0.694415201					
Adjusted R Square	0.692698432					
Standard Error	152.6411927					
Observations	180					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	9424340.652	9424340.652	404.4897064	1.07394E-47	
Residual	178	4147281.401	23299.33371			
Total	179	13571622.05				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	527.9648927	21.95360276	24.04912299	8.2067E-58	484.6420726	571.2877129
X Variable 1	0.69429252	0.034521428	20.11192945	1.07394E-47	0.626168594	0.762416446

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Carmacks

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)
Jan-01	975.8		724.60	1,209.6	
Feb-01	930.1		864.10	898.7	
Mar-01	1077.8		765.30	1,096.7	
Apr-01	775.1		505.30	776.3	
May-01	690.3		390.40	640.8	
Jun-01	697.5		167.30	692.9	
Jul-01	566.7		139.60	549.3	
Aug-01	566.5		139.60	584.7	
Sep-01	743.9		309.00	749.8	
Oct-01	726.0		573.40	703.0	
Nov-01	998.6		818.00	991.8	
Dec-01	885.3	9,633.7	1094.60	800.4	9,694.2
Jan-02	1218.6		938.10	1,304.2	
Feb-02	1166.3		824.60	1,162.3	
Mar-02	942.3		921.00	853.1	
Apr-02	853.0		653.30	751.4	
May-02	811.7		361.60	782.2	
Jun-02	552.2		175.60	541.9	
Jul-02	580.1		130.90	568.7	
Aug-02	712.1		182.80	700.4	
Sep-02	638.1		314.40	640.3	
Oct-02	896.0		444.30	962.6	
Nov-02	783.3		582.60	940.0	
Dec-02	999.2	10,153.0	845.10	1,087.6	10,294.6
Jan-03	1067.0		992.60	1,114.7	
Feb-03	944.3		756.60	987.5	
Mar-03	886.3		832.20	858.8	
Apr-03	896.6		514.30	891.5	
May-03	751.3		363.70	720.3	
Jun-03	555.8		192.80	533.5	
Jul-03	678.5		84.20	699.6	
Aug-03	595.3		180.60	585.0	
Sep-03	714.6		359.20	685.7	
Oct-03	849.9		466.70	900.9	
Nov-03	923.6		874.60	877.6	
Dec-03	1239.6	10,102.7	911.60	1,281.8	10,136.9
Jan-04	1229.5		1254.00	1,095.7	
Feb-04	942.6		697.20	1,027.0	
Mar-04	928.2		753.50	955.3	
Apr-04	949.1		466.60	977.1	
May-04	638.5		272.50	670.9	
Jun-04	552.2		83.70	605.7	
Jul-04	655.6		74.20	683.6	
Aug-04	501.2		101.70	545.8	
Sep-04	788.2		367.50	753.6	
Oct-04	803.3		540.50	803.1	
Nov-04	860.8		719.80	922.2	
Dec-04	950.1	9,799.2	899.50	1,000.7	10,040.6
Jan-05	1479.2		1165.80	1,406.7	
Feb-05	1034.0		795.20	1,050.4	
Mar-05	842.0		613.70	966.2	
Apr-05	955.3		453.30	992.6	
May-05	665.6		256.60	709.0	
Jun-05	684.4		154.40	688.8	
Jul-05	550.4		132.60	537.8	
Aug-05	592.9		150.80	603.3	
Sep-05	760.7		299.30	773.5	
Oct-05	774.9		534.60	778.8	
Nov-05	949.6		762.60	981.3	
Dec-05	919.1	10,208.2	794.40	1,042.7	10,531.1
Jan-06	1402.2		1096.20	1,378.0	
Feb-06	980.2		821.30	978.5	
Mar-06	1262.8		906.30	1,183.9	
Apr-06	805.1		519.10	796.7	
May-06	688.7		346.90	669.4	
Jun-06	697.7		173.10	689.1	
Jul-06	640.6		118.40	637.9	
Aug-06	515.0		201.60	490.2	
Sep-06	742.3		295.70	757.5	
Oct-06	749.7		520.50	763.4	
Nov-06	1006.4		1162.20	760.6	
Dec-06	1108.0	10,598.7	824.30	1,210.8	10,315.9

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Carmacks

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Annual Normalized UPC (kWh)		Regression Output:
	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-07	1554.1		912.00	1,657.8		
Feb-07	1055.0		998.80	930.0		
Mar-07	1221.1		954.20	1,108.9		
Apr-07	858.2		486.40	872.5		
May-07	656.9		322.10	654.8		
Jun-07	728.5		140.50	742.5		
Jul-07	590.2		102.30	598.7		
Aug-07	647.7		154.20	655.8		
Sep-07	654.7		308.40	661.1		
Oct-07	762.8		543.70	760.3		
Nov-07	1083.3		724.60	1,141.3		
Dec-07	918.9	10,731.3	1069.50	851.5	10,635.3	
Jan-08	1321.8		1113.80	1,285.4		
Feb-08	1748.9		954.60	1,654.6		
Mar-08	1140.2		734.70	1,180.4		
Apr-08	873.5		517.30	866.3		
May-08	829.7		307.90	837.5		
Jun-08	709.6		225.60	664.5		
Jul-08	522.3		173.40	481.3		
Aug-08	687.0		187.70	671.8		
Sep-08	753.1		318.70	752.3		
Oct-08	824.9		563.00	809.0		
Nov-08	1161.5		782.50	1,179.4		
Dec-08	1092.1	11,664.6	1186.20	943.7	11,326.4	
Jan-09	1569.0		1137.90	1,515.9		
Feb-09	1236.1		955.40	1,141.3		
Mar-09	1113.3		868.50	1,060.6		
Apr-09	996.4		515.20	990.7		
May-09	612.1		331.20	603.7		
Jun-09	571.7		144.10	583.2		
Jul-09	666.5		62.50	702.6		
Aug-09	598.2		158.30	603.4		
Sep-09	822.2		306.10	830.2		
Oct-09	813.0		541.80	811.9		
Nov-09	1007.5		781.50	1,026.0		
Dec-09	1085.2	11,091.2	955.20	1,097.2	10,966.6	
Jan-10	1623.1		991.10	1,671.8		
Feb-10	1029.4		679.20	1,126.3		
Mar-10	1034.7		656.00	1,129.5		
Apr-10	1023.4		461.20	1,055.2		
May-10	800.3		292.00	819.1		
Jun-10	565.8		171.90	558.0		
Jul-10	716.8		117.30	714.8		
Aug-10	673.2		146.20	686.8		
Sep-10	737.7		332.40	727.4		
Oct-10	867.2		520.40	881.0		
Nov-10	964.2		717.60	1,027.1		
Dec-10	1074.8	11,110.5	1162.50	942.9	11,340.0	
Jan-11	1619.0		1010.20	1,654.5		
Feb-11	1314.8		905.60	1,254.6		
Mar-11	1226.6		901.70	1,150.9		
Apr-11	914.1		511.20	911.1		
May-11	879.9		296.40	895.7		
Jun-11	597.8		161.00	597.6		
Jul-11	678.0		127.80	668.8		
Aug-11	693.5		217.90	657.4		
Sep-11	842.9		328.50	835.3		
Nov-11	835.8		513.30	854.5		
Nov-11	1103.0		931.70	1,017.3		
Dec-11	1062.4	11,767.8	775.10	1,199.4	11,697.0	
Jan-12	1703.0		1118.10	1,663.6		
Feb-12	1190.9		691.70	1,279.2		
Mar-12	1449.9		756.20	1,475.2		
Apr-12	690.4		450.60	729.5		
May-12	804.3		350.80	782.2		
Jun-12	756.3		195.10	732.4		
Jul-12	564.0		140.10	546.2		
Aug-12	759.0		157.90	764.5		
Sep-12	658.7		271.00	691.1		
Oct-12	801.3		639.30	732.5		
Nov-12	1382.2		969.60	1,270.2		
Dec-12	1290.4	12,050.4	1196.80	1,134.6	11,801.2	

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Carmacks

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)	MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-13	1,551.4		952.00	1,627.3		
Feb-13	1,103.7		665.40	1,210.3		
Mar-13	1,129.4		851.10	1,088.8		
Apr-13	1,261.5		639.90	1,169.3		
May-13	857.1		294.00	874.5		
Jun-13	568.8		112.40	602.4		
Jul-13	626.6		92.50	641.8		
Aug-13	696.6		98.90	743.1		
Sep-13	614.4		264.30	651.4		
Oct-13	983.9		501.40	1,010.9		
Nov-13	947.9		865.60	908.0		
Dec-13	1,003.9	11,345.3	1144.70	884.3	11,412.0	
Jan-14	1,708.4		745.80	1,927.5		
Feb-14	1,210.7		992.40	1,090.2		
Mar-14	1,052.8		855.10	1,009.4		
Apr-14	921.1		499.80	926.1		
May-14	896.7		269.50	931.1		
Jun-14	589.1		200.50	561.4		
Jul-14	549.7		98.00	561.1		
Aug-14	734.6		144.00	749.8		
Sep-14	621.8		307.10	629.1		
Oct-14	943.9		515.60	960.9		
Nov-14	960.6		772.80	985.2		
Dec-14	1,431.2	11,620.4	854.40	1,513.1	11,844.9	
Jan-15	1,265.4		927.00	1,358.7		
Feb-15	1,129.5		851.40	1,106.9		
Mar-15	1,179.2		671.30	1,263.4		
Apr-15	878.6		453.50	915.7		
May-15	771.9		192.90	859.5		
Jun-15	515.3		127.20	538.5		
Jul-15	662.1		115.70	661.3		
Aug-15	562.8		183.20	550.8		
Sep-15	767.6		332.70	757.1		
Oct-15	925.5		469.80	974.4		
Nov-15	1,084.0		759.20	1,118.1		
Dec-15	1,384.8	11,126.7	947.90	1,401.8	11,506.1	
Jan-16	1073.3		827.6	1,235.6		
Feb-16	1045.3		688.0	1,136.2		
Mar-16	928.6		611.6	1,054.3		
Apr-16	919.5					
May-16	863.1					
Jun-16	540.7					
Jul-16	664.0					
Aug-16	553.1					
Sep-16	760.2					
Oct-16	978.4					
Nov-16	1122.7					
Dec-16	1407.6	10,856.5			11,235.2	
Jan-17	1235.6					
Feb-17	1136.2					
Mar-17	1054.3					
Apr-17	919.5					
May-17	863.1					
Jun-17	540.7					
Jul-17	664.0					
Aug-17	553.1					
Sep-17	760.2					
Oct-17	978.4					
Nov-17	1122.7					
Dec-17	1407.6	11,235.2			11,235.2	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ { (1/(2015 - 2013)) - 1} =$$

$$= (11,506.1 / 11,412.0) ^ { (1/2) - 1} = \mathbf{0.4\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Section 2
Attachment 3

Carcross

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	1001.3		1020.10	1,015.8		SUMMARY OUTPUT
Feb-95	806.9		840.10	799.5		Regression Statistics
Mar-95	749.5		880.00	718.9		Multiple R 0.713287269
Apr-95	642.0		439.90	665.5		R Square 0.508778729
May-95	613.6		250.70	637.5		Adjusted R Square 0.506019059
Jun-95	475.7		139.00	483.3		Standard Error 114.0676563
Jul-95	477.7		96.60	484.0		Observations 180
Aug-95	409.5		198.30	398.1		
Sep-95	458.3		226.50	490.2		
Oct-95	525.8		524.90	531.2		
Nov-95	540.9		894.40	510.7		
Dec-95	635.0	7,336.3	1048.60	608.3	7,343.0	
Jan-96	956.5		1530.10	792.3		
Feb-96	1084.5		835.80	1,078.5		
Mar-96	853.3		805.80	848.7		
Apr-96	677.2		526.00	670.5		
May-96	659.7		357.30	646.3		
Jun-96	549.1		193.60	537.5		
Jul-96	472.5		124.90	468.9		
Aug-96	444.4		227.30	422.8		
Sep-96	548.6		362.60	532.9		
Oct-96	534.0		679.90	485.1		
Nov-96	659.3		975.00	600.9		
Dec-96	740.6	8,179.7	1155.80	676.3	7,760.8	
Jan-97	1043.6		1185.70	1,000.0		
Feb-97	801.3		656.50	858.2		
Mar-97	695.9		855.40	673.9		
Apr-97	694.4		484.00	702.5		
May-97	564.0		331.10	559.8		
Jun-97	554.1		148.90	558.2		
Jul-97	473.4		92.80	481.0		
Aug-97	428.6		130.00	441.1		
Sep-97	453.6		282.10	466.0		
Oct-97	471.8		641.00	436.5		
Nov-97	669.4		685.80	712.3		
Dec-97	627.2	7,477.4	762.00	700.9	7,590.5	
Jan-98	795.4		1165.70	758.8		
Feb-98	784.9		719.10	819.8		
Mar-98	698.5		756.60	711.1		
Apr-98	607.4		458.60	624.3		
May-98	582.9		270.60	599.9		
Jun-98	472.7		119.50	487.1		
Jul-98	428.2		111.60	429.2		
Aug-98	436.6		189.20	428.4		
Sep-98	459.9		327.80	456.3		
Oct-98	499.1		557.70	493.0		
Nov-98	571.2		792.30	576.8		
Dec-98	584.9	6,921.7	1051.80	557.1	6,941.9	
Jan-99	838.3		1183.10	795.7		
Feb-99	727.8		976.40	672.6		
Mar-99	692.8		734.00	713.3		
Apr-99	606.9		508.80	606.3		
May-99	609.4		391.90	583.9		
Jun-99	501.1		153.90	503.5		
Jul-99	488.6		108.60	490.7		
Aug-99	412.2		145.70	419.3		
Sep-99	434.5		311.20	436.8		
Oct-99	540.5		499.80	554.7		
Nov-99	526.6		792.50	532.1		
Dec-99	790.7	7,169.5	844.00	835.7	7,144.4	
Jan-00	557.9		1082.90	550.3		
Feb-00	695.4		735.20	724.7		
Mar-00	576.8		659.20	623.5		
Apr-00	587.8		515.60	584.7		
May-00	525.7		382.00	503.6		
Jun-00	488.2		172.50	484.0		
Jul-00	448.3		142.10	438.6		
Aug-00	391.0		219.70	372.2		
Sep-00	500.1		354.20	487.3		
Oct-00	455.1		537.20	456.1		
Nov-00	503.1		694.20	543.1		
Dec-00	630.9	6,360.2	973.00	630.7	6,398.9	

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Carcross

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	UPC (kWh)	UPC (kWh)	
Jan-01	635.8		724.60	753.8	
Feb-01	556.0		864.10	540.2	
Mar-01	674.2		765.30	683.8	
Apr-01	531.8		505.30	532.4	
May-01	511.1		390.40	486.1	
Jun-01	505.7		167.30	503.4	
Jul-01	412.3		139.60	403.5	
Aug-01	427.9		139.60	437.1	
Sep-01	409.7		309.00	412.7	
Oct-01	447.8		573.40	436.2	
Nov-01	539.8		818.00	536.4	
Dec-01	612.1	6,264.3	1094.60	569.3	6,294.8
Jan-02	817.5		938.10	860.7	
Feb-02	635.9		824.60	633.9	
Mar-02	642.3		921.00	597.3	
Apr-02	651.1		653.30	599.9	
May-02	568.3		361.60	553.4	
Jun-02	462.5		175.60	457.2	
Jul-02	433.5		130.90	427.8	
Aug-02	445.6		182.80	439.7	
Sep-02	445.8		314.40	446.9	
Oct-02	473.6		444.30	507.2	
Nov-02	566.5		582.60	645.5	
Dec-02	552.0	6,694.7	845.10	596.6	6,766.2
Jan-03	744.3		992.60	768.3	
Feb-03	625.2		756.60	647.0	
Mar-03	609.3		832.20	595.4	
Apr-03	612.1		514.30	609.6	
May-03	560.0		363.70	544.3	
Jun-03	482.0		192.80	470.8	
Jul-03	472.8		84.20	483.4	
Aug-03	421.9		180.60	416.8	
Sep-03	459.7		359.20	445.1	
Oct-03	437.4		466.70	463.2	
Nov-03	584.1		874.60	560.8	
Dec-03	662.4	6,671.1	911.60	683.7	6,688.4
Jan-04	795.1		1254.00	727.6	
Feb-04	716.4		697.20	759.0	
Mar-04	592.9		753.50	606.5	
Apr-04	589.8		466.60	604.0	
May-04	569.2		272.50	585.5	
Jun-04	439.0		83.70	466.0	
Jul-04	486.1		74.20	500.2	
Aug-04	395.1		101.70	417.6	
Sep-04	394.2		367.50	376.7	
Oct-04	488.3		540.50	488.2	
Nov-04	570.8		719.80	601.8	
Dec-04	637.9	6,674.6	899.50	663.4	6,796.4
Jan-05	859.8		1165.80	823.3	
Feb-05	760.4		795.20	768.7	
Mar-05	642.2		613.70	704.9	
Apr-05	604.3		453.30	623.1	
May-05	506.2		256.60	528.1	
Jun-05	432.7		154.40	434.9	
Jul-05	450.9		132.60	444.5	
Aug-05	398.2		150.80	403.5	
Sep-05	469.6		299.30	476.0	
Oct-05	524.3		534.60	526.2	
Nov-05	557.6		762.60	573.6	
Dec-05	655.3	6,861.5	794.40	717.6	7,024.4
Jan-06	841.8		1096.20	829.6	
Feb-06	737.1		821.30	736.3	
Mar-06	649.5		906.30	609.6	
Apr-06	691.4		519.10	687.1	
May-06	517.8		346.90	508.1	
Jun-06	590.9		173.10	586.5	
Jul-06	442.8		118.40	441.5	
Aug-06	462.3		201.60	449.8	
Sep-06	480.2		295.70	487.9	
Oct-06	496.8		520.50	503.7	
Nov-06	612.3		1162.20	488.3	
Dec-06	811.3	7,334.2	824.30	863.2	7,191.5

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Carcross

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	830.6		912.00	882.9		
Feb-07	810.4		998.80	747.4		
Mar-07	791.8		954.20	735.1		
Apr-07	732.1		486.40	739.3		
May-07	555.0		322.10	553.9		
Jun-07	528.5		140.50	535.6		
Jul-07	458.7		102.30	463.0		
Aug-07	465.0		154.20	469.1		
Sep-07	451.0		308.40	454.2		
Oct-07	499.5		543.70	498.3		
Nov-07	229.0		724.60	258.3		
Dec-07	679.6	7,031.2	1069.50	645.6	6,982.8	
Jan-08	824.1		1113.80	805.7		
Feb-08	961.0		954.60	913.5		
Mar-08	726.7		734.70	746.9		
Apr-08	687.4		517.30	683.8		
May-08	614.7		307.90	618.6		
Jun-08	493.0		225.60	470.3		
Jul-08	456.9		173.40	436.2		
Aug-08	506.6		187.70	499.0		
Sep-08	453.3		318.70	452.9		
Oct-08	496.1		563.00	488.1		
Nov-08	623.3		782.50	632.3		
Dec-08	724.7	7,567.9	1186.20	649.9	7,397.3	
Jan-09	909.3		1137.90	882.5		
Feb-09	893.4		955.40	845.5		
Mar-09	825.3		868.50	798.7		
Apr-09	763.9		515.20	761.1		
May-09	696.2		331.20	691.9		
Jun-09	516.9		144.10	522.7		
Jul-09	497.5		62.50	515.7		
Aug-09	440.6		158.30	443.3		
Sep-09	473.8		306.10	477.9		
Oct-09	560.8		541.80	560.2		
Nov-09	617.2		781.50	626.6		
Dec-09	746.3	7,941.2	955.20	752.3	7,878.3	
Jan-10	951.2		991.10	975.8		
Feb-10	924.8		679.20	973.7		
Mar-10	740.6		656.00	788.4		
Apr-10	675.8		461.20	691.9		
May-10	649.7		292.00	659.2		
Jun-10	530.3		171.90	526.3		
Jul-10	481.3		117.30	480.3		
Aug-10	459.2		146.20	466.1		
Sep-10	454.1		332.40	448.9		
Oct-10	576.3		520.40	583.2		
Nov-10	632.6		717.60	664.4		
Dec-10	692.0	7,767.7	1162.50	625.4	7,883.5	
Jan-11	1038.1		1010.20	1,056.0		
Feb-11	873.7		905.60	843.3		
Mar-11	930.3		901.70	892.1		
Apr-11	796.1		511.20	794.6		
May-11	587.2		296.40	595.2		
Jun-11	560.3		161.00	560.2		
Jul-11	456.9		127.80	452.2		
Aug-11	438.6		217.90	420.4		
Sep-11	517.0		328.50	513.1		
Oct-11	531.5		513.30	541.0		
Nov-11	615.9		931.70	572.7		
Dec-11	839.1	8,184.7	775.10	908.3	8,149.0	
Jan-12	851.9		1118.10	832.0		
Feb-12	1019.8		691.70	1,064.3		
Mar-12	711.7		756.20	724.4		
Apr-12	684.7		450.60	704.4		
May-12	622.4		350.80	611.3		
Jun-12	543.5		195.10	531.4		
Jul-12	484.5		140.10	475.5		
Aug-12	511.3		157.90	514.1		
Sep-12	519.8		271.00	536.1		
Oct-12	520.9		639.30	486.2		
Nov-12	704.4		969.60	647.9		
Dec-12	819.4	7,994.3	1196.80	740.8	7,868.5	

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Carcross

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,109.8		952.00	1,148.1		
Feb-13	930.9		665.40	984.6		
Mar-13	770.6		851.10	750.1		
Apr-13	793.2		639.90	746.7		
May-13	742.3		294.00	751.1		
Jun-13	552.9		112.40	569.8		
Jul-13	458.9		92.50	466.6		
Aug-13	449.8		98.90	473.2		
Sep-13	449.9		264.30	468.5		
Oct-13	485.5		501.40	499.1		
Nov-13	659.7		865.60	639.6		
Dec-13	754.9	8,158.4	1144.70	694.5	8,192.0	
Jan-14	1,035.2		745.80	1,145.7		
Feb-14	784.0		992.40	723.2		
Mar-14	915.4		855.10	893.5		
Apr-14	796.3		499.80	798.9		
May-14	716.6		269.50	733.9		
Jun-14	487.0		200.50	473.0		
Jul-14	517.5		98.00	523.3		
Aug-14	437.1		144.00	444.8		
Sep-14	465.3		307.10	469.0		
Oct-14	547.8		515.60	556.4		
Nov-14	629.4		772.80	641.8		
Dec-14	709.3	8,040.9	854.40	750.6	8,154.2	
Jan-15	989.5		927.00	1,036.6		
Feb-15	874.2		851.40	862.8		
Mar-15	858.9		671.30	901.4		
Apr-15	695.3		453.50	714.0		
May-15	679.7		192.90	723.9		
Jun-15	475.4		127.20	487.1		
Jul-15	405.4		115.70	405.0		
Aug-15	479.4		183.20	473.4		
Sep-15	447.4		332.70	442.2		
Oct-15	602.6		469.80	627.3		
Nov-15	593.3		759.20	610.5		
Dec-15	782.7	7,884.0	947.90	791.3	8,075.5	
Jan-16	993.3		827.6	1,075.2		
Feb-16	847.5		688.0	893.3		
Mar-16	834.1		611.6	897.5		
Apr-16	708.9					
May-16	718.8					
Jun-16	483.7					
Jul-16	402.1					
Aug-16	470.0					
Sep-16	439.0					
Oct-16	622.8					
Nov-16	606.1					
Dec-16	785.6	7,911.8			8,102.9	
Jan-17	1,067.5					
Feb-17	886.9					
Mar-17	891.0					
Apr-17	703.9					
May-17	713.6					
Jun-17	480.2					
Jul-17	399.3					
Aug-17	466.6					
Sep-17	435.9					
Oct-17	618.4					
Nov-17	601.8					
Dec-17	780.0	8,045.1			8,045.1	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (8,075.5 / 8,192.0) ^ {1/2} - 1 = -0.7\%$$

Note: January, February and March 2016 have been updated to include actuals.

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Haines Junction

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	1035.49		1020.10	1,049.1		SUMMARY OUTPUT
Feb-95	814.39		840.10	807.4		Regression Statistics
Mar-95	860.37		880.00	831.5		Multiple R 0.807071528
Apr-95	675.41		439.90	697.6		R Square 0.651364451
May-95	719.65		250.70	742.3		Adjusted R Square 0.649405824
Jun-95	614.09		139.00	621.3		Standard Error 80.17237079
Jul-95	597.65		96.60	603.6		Observations 180
Aug-95	546.52		198.30	535.8		
Sep-95	650.47		226.50	680.6		ANOVA
Oct-95	647.14		524.90	652.2		
Nov-95	690.78		894.40	662.3		
Dec-95	847.14	8,699.1	1048.60	822.0	8,705.4	
Jan-96	1041.53		1530.10	886.5		
Feb-96	1011.72		835.80	1,006.1		
Mar-96	785.67		805.80	781.3		
Apr-96	734.34		526.00	728.1		
May-96	644.15		357.30	631.5		
Jun-96	606.21		193.60	595.3		
Jul-96	552.66		124.90	549.2		
Aug-96	571.52		227.30	551.2		
Sep-96	605.00		362.60	590.1		
Oct-96	627.22		679.90	581.0		
Nov-96	794.73		975.00	739.6		
Dec-96	880.76	8,855.5	1155.80	820.1	8,460.1	
Jan-97	1150.56		1185.70	1,109.4		
Feb-97	813.12		656.50	866.8		
Mar-97	721.28		855.40	700.5		
Apr-97	720.85		484.00	728.5		
May-97	659.36		331.10	655.4		
Jun-97	621.21		148.90	625.1		
Jul-97	571.04		92.80	578.2		
Aug-97	549.42		130.00	561.3		
Sep-97	598.54		282.10	610.3		
Oct-97	597.60		641.00	564.3		
Nov-97	758.04		685.80	798.5		
Dec-97	743.43	8,504.5	762.00	813.0	8,611.3	
Jan-98	983.84		1165.70	949.3		
Feb-98	757.50		719.10	790.5		
Mar-98	736.82		756.60	748.7		
Apr-98	667.46		458.60	683.5		
May-98	640.89		270.60	656.9		
Jun-98	570.83		119.50	584.4		
Jul-98	589.06		111.60	590.0		
Aug-98	505.35		189.20	497.6		
Sep-98	599.34		327.80	596.0		
Oct-98	659.23		557.70	653.4		
Nov-98	688.74		792.30	694.0		
Dec-98	705.63	8,104.7	1051.80	679.4	8,123.8	
Jan-99	1022.46		1183.10	982.2		
Feb-99	836.84		976.40	784.7		
Mar-99	758.68		734.00	778.1		
Apr-99	734.47		508.80	733.9		
May-99	605.20		391.90	581.1		
Jun-99	616.08		153.90	618.3		
Jul-99	589.39		108.60	591.3		
Aug-99	538.63		145.70	545.3		
Sep-99	588.89		311.20	591.0		
Oct-99	650.77		499.80	664.1		
Nov-99	711.91		792.50	717.1		
Dec-99	771.21	8,424.5	844.00	813.7	8,400.8	
Jan-00	919.17		1082.90	912.0		
Feb-00	767.81		735.20	795.5		
Mar-00	696.01		659.20	740.1		
Apr-00	653.56		515.60	650.7		
May-00	647.12		382.00	626.3		
Jun-00	633.92		172.50	630.0		
Jul-00	589.23		142.10	580.1		
Aug-00	565.57		219.70	547.8		
Sep-00	624.94		354.20	612.8		
Oct-00	645.35		537.20	646.3		
Nov-00	694.52		694.20	732.2		
Dec-00	704.97	8,142.2	973.00	704.8	8,178.7	

ATCO Electric Yukon
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Haines Junction

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	947.85		724.60	1,059.2		
Feb-01	740.58		864.10	725.6		
Mar-01	687.40		765.30	696.4		
Apr-01	631.85		505.30	632.4		
May-01	667.55		390.40	644.0		
Jun-01	650.33		167.30	648.1		
Jul-01	567.84		139.60	559.5		
Aug-01	570.31		139.60	579.0		
Sep-01	569.35		309.00	572.2		
Oct-01	632.74		573.40	621.8		
Nov-01	719.41		818.00	716.2		
Dec-01	848.28	8,233.5	1094.60	807.9	8,262.3	
Jan-02	965.83		938.10	1,006.6		
Feb-02	752.27		824.60	750.4		
Mar-02	737.50		921.00	695.0		
Apr-02	771.65		653.30	723.3		
May-02	629.03		361.60	615.0		
Jun-02	599.90		175.60	595.0		
Jul-02	567.28		130.90	561.9		
Aug-02	566.34		182.80	560.7		
Sep-02	599.66		314.40	600.7		
Oct-02	638.58		444.30	670.3		
Nov-02	776.11		582.60	850.7		
Dec-02	624.76	8,228.9	845.10	666.9	8,296.3	
Jan-03	924.87		992.60	947.6		
Feb-03	708.42		756.60	729.0		
Mar-03	661.09		832.20	648.0		
Apr-03	649.40		514.30	647.0		
May-03	595.58		363.70	580.8		
Jun-03	585.92		192.80	575.3		
Jul-03	545.20		84.20	555.2		
Aug-03	514.74		180.60	509.9		
Sep-03	564.92		359.20	551.2		
Oct-03	546.52		466.70	570.8		
Nov-03	668.22		874.60	646.3		
Dec-03	772.74	7,737.6	911.60	792.9	7,753.9	
Jan-04	872.87		1254.00	809.2		
Feb-04	767.27		697.20	807.5		
Mar-04	635.49		753.50	648.4		
Apr-04	672.11		466.60	685.5		
May-04	550.50		272.50	565.9		
Jun-04	506.18		83.70	531.6		
Jul-04	581.92		74.20	595.2		
Aug-04	489.54		101.70	510.8		
Sep-04	573.71		367.50	557.2		
Oct-04	567.32		540.50	567.2		
Nov-04	649.55		719.80	678.8		
Dec-04	765.21	7,631.7	899.50	789.3	7,746.6	
Jan-05	865.66		1165.80	831.1		
Feb-05	799.12		795.20	806.9		
Mar-05	619.53		613.70	678.7		
Apr-05	686.53		453.30	704.3		
May-05	568.24		256.60	588.9		
Jun-05	531.01		154.40	533.1		
Jul-05	561.76		132.60	555.8		
Aug-05	495.10		150.80	500.1		
Sep-05	646.17		299.30	652.2		
Oct-05	572.83		534.60	574.7		
Nov-05	687.06		762.60	702.1		
Dec-05	705.12	7,738.1	794.40	764.0	7,891.9	
Jan-06	876.57		1096.20	865.0		
Feb-06	787.19		821.30	786.4		
Mar-06	737.76		906.30	700.2		
Apr-06	634.57		519.10	630.6		
May-06	620.22		346.90	611.0		
Jun-06	565.22		173.10	561.1		
Jul-06	599.03		118.40	597.7		
Aug-06	530.52		201.60	518.7		
Sep-06	580.60		295.70	587.8		
Oct-06	513.53		520.50	520.0		
Nov-06	757.45		1162.20	640.4		
Dec-06	659.12	7,861.8	824.30	708.1	7,727.1	

ATCO Electric Yukon
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Section 2
Attachment 4

Haines Junction

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1088.17		912.00	1,137.6		
Feb-07	791.83		998.80	732.3		
Mar-07	795.39		954.20	742.0		
Apr-07	713.40		486.40	720.2		
May-07	540.96		322.10	540.0		
Jun-07	629.17		140.50	635.8		
Jul-07	478.58		102.30	482.6		
Aug-07	493.46		154.20	497.3		
Sep-07	611.35		308.40	614.4		
Oct-07	554.34		543.70	553.2		
Nov-07	689.91		724.60	717.6		
Dec-07	745.97	8,132.5	1069.50	713.9	8,086.8	
Jan-08	912.87		1113.80	895.5		
Feb-08	846.73		954.60	801.8		
Mar-08	843.51		734.70	862.6		
Apr-08	670.54		517.30	667.1		
May-08	563.76		307.90	567.5		
Jun-08	521.70		225.60	500.2		
Jul-08	603.53		173.40	584.0		
Aug-08	527.07		187.70	519.8		
Sep-08	586.83		318.70	586.5		
Oct-08	519.77		563.00	512.2		
Nov-08	668.89		782.50	677.4		
Dec-08	757.37	8,022.6	1186.20	686.7	7,861.5	
Jan-09	1021.75		1137.90	996.4		
Feb-09	730.55		955.40	685.4		
Mar-09	789.49		868.50	764.4		
Apr-09	640.24		515.20	637.5		
May-09	683.39		331.20	679.4		
Jun-09	548.03		144.10	553.5		
Jul-09	535.04		62.50	552.2		
Aug-09	507.97		158.30	510.5		
Sep-09	532.13		306.10	535.9		
Oct-09	577.93		541.80	577.4		
Nov-09	738.06		781.50	746.9		
Dec-09	700.84	8,005.4	955.20	706.5	7,946.1	
Jan-10	961.89		991.10	985.1		
Feb-10	714.53		679.20	760.7		
Mar-10	712.94		656.00	758.1		
Apr-10	609.79		461.20	624.9		
May-10	615.98		292.00	624.9		
Jun-10	578.19		171.90	574.5		
Jul-10	518.10		117.30	517.2		
Aug-10	488.66		146.20	495.2		
Sep-10	549.61		332.40	544.7		
Oct-10	572.26		520.40	578.8		
Nov-10	681.19		717.60	711.2		
Dec-10	710.29	7,713.4	1162.50	647.4	7,822.7	
Jan-11	999.60		1010.20	1,016.5		
Feb-11	753.69		905.60	725.0		
Mar-11	773.04		901.70	737.0		
Apr-11	659.04		511.20	657.7		
May-11	665.59		296.40	673.1		
Jun-11	541.03		161.00	540.9		
Jul-11	535.52		127.80	531.1		
Aug-11	466.57		217.90	449.4		
Sep-11	516.28		328.50	512.7		
Nov-11	600.63		513.30	609.5		
Nov-11	681.86		931.70	641.0		
Dec-11	735.64	7,928.5	775.10	800.9	7,894.7	
Jan-12	928.36		1118.10	909.6		
Feb-12	821.58		691.70	863.6		
Mar-12	730.15		756.20	742.2		
Apr-12	655.88		450.60	674.5		
May-12	548.21		350.80	537.7		
Jun-12	599.23		195.10	587.8		
Jul-12	537.57		140.10	529.1		
Aug-12	429.88		157.90	432.5		
Sep-12	560.48		271.00	575.9		
Oct-12	571.07		639.30	538.3		
Nov-12	670.46		969.60	617.1		
Dec-12	905.15	7,958.0	1196.80	831.0	7,839.4	

ATCO Electric Yukon
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Section 2
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Haines Junction

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	990.8		952.00	1,026.9		
Feb-13	851.0		665.40	901.7		
Mar-13	775.5		851.10	756.2		
Apr-13	729.3		639.90	685.3		
May-13	620.4		294.00	628.7		
Jun-13	632.9		112.40	648.9		
Jul-13	553.4		92.50	560.7		
Aug-13	387.2		98.90	409.3		
Sep-13	554.0		264.30	571.6		
Oct-13	550.7		501.40	563.5		
Nov-13	622.8		865.60	603.8		
Dec-13	819.7	8,087.6	1144.70	762.7	8,119.3	
Jan-14	1,024.4		745.80	1,128.8		
Feb-14	733.8		992.40	676.4		
Mar-14	844.8		855.10	824.2		
Apr-14	635.8		499.80	638.1		
May-14	627.0		269.50	643.4		
Jun-14	523.0		200.50	509.8		
Jul-14	519.9		98.00	525.4		
Aug-14	494.3		144.00	501.6		
Sep-14	556.2		307.10	559.7		
Oct-14	541.6		515.60	549.7		
Nov-14	602.3		772.80	614.0		
Dec-14	825.1	7,928.3	854.40	864.1	8,035.2	
Jan-15	974.7		927.00	1,019.2		
Feb-15	910.6		851.40	899.9		
Mar-15	632.5		671.30	672.6		
Apr-15	724.0		453.50	741.7		
May-15	493.9		192.90	535.6		
Jun-15	513.3		127.20	524.4		
Jul-15	524.5		115.70	524.1		
Aug-15	462.5		183.20	456.8		
Sep-15	585.5		332.70	580.5		
Oct-15	548.3		469.80	571.6		
Nov-15	650.2		759.20	666.4		
Dec-15	868.8	7,888.6	947.90	876.9	8,069.3	
Jan-16	932.4		827.6	1,009.7		
Feb-16	777.1		688.0	820.4		
Mar-16	742.0		611.6	801.9		
Apr-16	739.4					
May-16	533.9					
Jun-16	522.7					
Jul-16	522.5					
Aug-16	455.3					
Sep-16	578.7					
Oct-16	569.8					
Nov-16	664.3					
Dec-16	874.2	7,912.4			8,092.8	
Jan-17	1,006.5					
Feb-17	817.9					
Mar-17	799.4					
Apr-17	737.1					
May-17	532.3					
Jun-17	521.1					
Jul-17	520.8					
Aug-17	453.9					
Sep-17	576.9					
Oct-17	568.1					
Nov-17	662.3					
Dec-17	871.5	8,067.8			8,067.8	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (8,069.3 / 8,119.3) ^ (1/2) - 1 = **-0.3%**

Note: January, February and March 2016 have been updated to include actuals.

**ATCO Electric Yukon
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**Section 2
Attachment 5**

Teslin

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	856.4		1020.10	869.2		SUMMARY OUTPUT
Feb-95	611.7		840.10	605.2		Regression Statistics
Mar-95	686.4		880.00	659.4		Multiple R 0.784148164
Apr-95	521.3		439.90	542.0		R Square 0.614888344
May-95	429.5		250.70	450.7		Adjusted R Square 0.612724795
Jun-95	401.7		139.00	408.4		Standard Error 80.98996635
Jul-95	492.8		96.60	498.3		Observations 180
Aug-95	428.4		198.30	418.4		
Sep-95	483.1		226.50	511.3		ANOVA
Oct-95	485.6		524.90	490.3		
Nov-95	628.6		894.40	602.0		
Dec-95	663.9	6,689.5	1048.60	640.4	6,695.5	
Jan-96	801.8		1530.10	657.0		
Feb-96	843.7		835.80	838.4		
Mar-96	595.6		805.80	591.5		
Apr-96	537.6		526.00	531.7		
May-96	501.0		357.30	489.2		
Jun-96	518.1		193.60	508.0		
Jul-96	453.5		124.90	450.2		
Aug-96	537.7		227.30	518.8		
Sep-96	456.9		362.60	443.0		
Oct-96	482.3		679.90	439.1		
Nov-96	686.3		975.00	634.8		
Dec-96	716.9	7,131.4	1155.80	660.3	6,762.1	
Jan-97	1002.0		1185.70	963.6		
Feb-97	652.9		656.50	703.0		
Mar-97	556.5		855.40	537.1		
Apr-97	565.7		484.00	572.8		
May-97	547.2		331.10	543.5		
Jun-97	461.9		148.90	465.5		
Jul-97	416.6		92.80	423.3		
Aug-97	516.1		130.00	527.1		
Sep-97	417.9		282.10	428.9		
Oct-97	564.1		641.00	533.0		
Nov-97	537.7		685.80	575.5		
Dec-97	608.8	6,847.4	762.00	673.8	6,947.1	
Jan-98	814.8		1165.70	782.6		
Feb-98	583.4		719.10	614.2		
Mar-98	544.1		756.60	555.3		
Apr-98	578.5		458.60	593.5		
May-98	446.5		270.60	461.4		
Jun-98	410.6		119.50	423.3		
Jul-98	499.3		111.60	500.2		
Aug-98	443.5		189.20	436.3		
Sep-98	458.1		327.80	455.0		
Oct-98	539.9		557.70	534.5		
Nov-98	553.9		792.30	558.8		
Dec-98	624.4	6,497.0	1051.80	599.9	6,514.9	
Jan-99	836.7		1183.10	799.1		
Feb-99	603.7		976.40	555.1		
Mar-99	659.0		734.00	677.1		
Apr-99	586.7		508.80	586.1		
May-99	457.8		391.90	435.3		
Jun-99	510.1		153.90	512.2		
Jul-99	508.8		108.60	510.6		
Aug-99	411.2		145.70	417.4		
Sep-99	463.3		311.20	465.3		
Oct-99	523.7		499.80	536.1		
Nov-99	511.7		792.50	516.5		
Dec-99	548.3	6,620.8	844.00	587.9	6,598.7	
Jan-00	836.9		1082.90	830.3		
Feb-00	564.4		735.20	590.2		
Mar-00	491.8		659.20	533.0		
Apr-00	545.3		515.60	542.6		
May-00	474.1		382.00	454.6		
Jun-00	513.8		172.50	510.2		
Jul-00	418.8		142.10	410.3		
Aug-00	422.9		219.70	406.3		
Sep-00	546.7		354.20	535.4		
Oct-00	487.1		537.20	488.0		
Nov-00	590.0		694.20	625.2		
Dec-00	565.5	6,457.3	973.00	565.3	6,491.4	

ATCO Electric Yukon
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Section 2
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Teslin

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	637.7		724.60	741.6		
Feb-01	570.3		864.10	556.3		
Mar-01	629.1		765.30	637.5		
Apr-01	537.2		505.30	537.7		
May-01	475.4		390.40	453.3		
Jun-01	515.5		167.30	513.4		
Jul-01	452.8		139.60	445.1		
Aug-01	423.7		139.60	431.8		
Sep-01	490.1		309.00	492.8		
Oct-01	473.4		573.40	463.1		
Nov-01	581.5		818.00	578.5		
Dec-01	640.3	6,426.9	1094.60	602.5	6,453.8	
Jan-02	639.5		938.10	677.5		
Feb-02	719.9		824.60	718.1		
Mar-02	537.7		921.00	498.1		
Apr-02	538.6		653.30	493.4		
May-02	583.9		361.60	570.8		
Jun-02	420.1		175.60	415.5		
Jul-02	427.5		130.90	422.5		
Aug-02	485.5		182.80	480.3		
Sep-02	416.0		314.40	417.0		
Oct-02	533.0		444.30	562.6		
Nov-02	528.8		582.60	598.4		
Dec-02	570.1	6,400.6	845.10	609.4	6,463.6	
Jan-03	721.3		992.60	742.5		
Feb-03	546.5		756.60	565.8		
Mar-03	531.1		832.20	518.8		
Apr-03	434.0		514.30	431.7		
May-03	565.0		363.70	551.2		
Jun-03	427.0		192.80	417.1		
Jul-03	479.8		84.20	489.1		
Aug-03	427.7		180.60	423.2		
Sep-03	463.7		359.20	450.8		
Oct-03	515.9		466.70	538.6		
Nov-03	535.5		874.60	515.0		
Dec-03	622.7	6,270.2	911.60	641.5	6,285.4	
Jan-04	831.7		1254.00	772.2		
Feb-04	643.2		697.20	680.7		
Mar-04	440.0		753.50	452.0		
Apr-04	574.9		466.60	587.4		
May-04	432.4		272.50	446.8		
Jun-04	450.1		83.70	473.8		
Jul-04	510.6		74.20	523.1		
Aug-04	405.3		101.70	425.1		
Sep-04	531.3		367.50	515.9		
Oct-04	503.4		540.50	503.3		
Nov-04	529.2		719.80	556.5		
Dec-04	575.7	6,427.7	899.50	598.3	6,535.1	
Jan-05	925.3		1165.80	893.0		
Feb-05	614.6		795.20	621.9		
Mar-05	534.6		613.70	589.8		
Apr-05	545.3		453.30	561.9		
May-05	480.0		256.60	499.3		
Jun-05	416.2		154.40	418.2		
Jul-05	466.4		132.60	460.8		
Aug-05	430.5		150.80	435.1		
Sep-05	522.5		299.30	528.1		
Oct-05	458.9		534.60	460.6		
Nov-05	552.6		762.60	566.7		
Dec-05	576.8	6,523.7	794.40	631.8	6,667.3	
Jan-06	815.8		1096.20	805.1		
Feb-06	599.6		821.30	598.8		
Mar-06	738.7		906.30	703.6		
Apr-06	511.4		519.10	507.6		
May-06	501.9		346.90	493.3		
Jun-06	523.5		173.10	519.7		
Jul-06	441.6		118.40	440.4		
Aug-06	419.2		201.60	408.2		
Sep-06	540.2		295.70	547.0		
Oct-06	477.3		520.50	483.3		
Nov-06	546.2		1162.20	436.9		
Dec-06	681.7	6,797.1	824.30	727.4	6,671.3	

ATCO Electric Yukon
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Section 2
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Teslin

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Annual Normalized UPC (kWh)	Regression Output:
	UPC (kWh)	UPC (kWh)			
Jan-07	822.0		912.00	868.1	
Feb-07	591.0		998.80	535.4	
Mar-07	736.7		954.20	686.8	
Apr-07	529.7		486.40	536.1	
May-07	616.8		322.10	615.9	
Jun-07	521.7		140.50	527.9	
Jul-07	443.7		102.30	447.5	
Aug-07	465.4		154.20	469.0	
Sep-07	500.5		308.40	503.3	
Oct-07	549.6		543.70	548.5	
Nov-07	645.2		724.60	671.0	
Dec-07	589.0	7,011.3	1069.50	559.0	6,968.5
Jan-08	883.3		1113.80	867.1	
Feb-08	943.0		954.60	901.1	
Mar-08	541.1		734.70	559.0	
Apr-08	545.6		517.30	542.4	
May-08	563.2		307.90	566.7	
Jun-08	417.2		225.60	397.2	
Jul-08	424.8		173.40	406.6	
Aug-08	530.8		187.70	524.0	
Sep-08	477.1		318.70	476.8	
Oct-08	601.1		563.00	594.1	
Nov-08	565.6		782.50	573.5	
Dec-08	641.2	7,134.1	1186.20	575.2	6,983.7
Jan-09	1032.7		1137.90	1,009.0	
Feb-09	915.6		955.40	873.4	
Mar-09	504.6		868.50	481.2	
Apr-09	543.1		515.20	540.5	
May-09	603.0		331.20	599.3	
Jun-09	418.4		144.10	423.5	
Jul-09	513.0		62.50	529.0	
Aug-09	427.4		158.30	429.8	
Sep-09	440.1		306.10	443.6	
Oct-09	561.6		541.80	561.1	
Nov-09	569.7		781.50	577.9	
Dec-09	659.2	7,188.3	955.20	664.5	7,133.0
Jan-10	891.2		991.10	912.9	
Feb-10	641.1		679.20	684.2	
Mar-10	608.2		656.00	650.4	
Apr-10	650.7		461.20	664.9	
May-10	491.3		292.00	499.7	
Jun-10	460.2		171.90	456.7	
Jul-10	531.6		117.30	530.7	
Aug-10	387.0		146.20	393.1	
Sep-10	526.2		332.40	521.7	
Oct-10	544.3		520.40	550.4	
Nov-10	617.8		717.60	645.8	
Dec-10	785.3	7,135.0	1162.50	726.6	7,237.0
Jan-11	858.5		1010.20	874.3	
Feb-11	654.0		905.60	627.2	
Mar-11	823.1		901.70	789.4	
Apr-11	554.5		511.20	553.2	
May-11	616.5		296.40	623.5	
Jun-11	456.2		161.00	456.1	
Jul-11	510.6		127.80	506.5	
Aug-11	434.3		217.90	418.3	
Sep-11	532.2		328.50	528.8	
Nov-11	532.4		513.30	540.7	
Nov-11	599.2		931.70	561.1	
Dec-11	711.5	7,283.0	775.10	772.4	7,251.5
Jan-12	956.1		1118.10	938.6	
Feb-12	675.7		691.70	714.9	
Mar-12	733.0		756.20	744.3	
Apr-12	577.7		450.60	595.1	
May-12	510.6		350.80	500.8	
Jun-12	501.5		195.10	490.9	
Jul-12	424.3		140.10	416.4	
Aug-12	390.3		157.90	392.8	
Sep-12	504.1		271.00	518.5	
Oct-12	496.1		639.30	465.5	
Nov-12	744.5		969.60	694.6	
Dec-12	776.3	7,290.2	1196.80	707.0	7,179.4

ATCO Electric Yukon
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Teslin

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	817.9		952.00	851.7		
Feb-13	794.7		665.40	842.0		
Mar-13	617.5		851.10	599.4		
Apr-13	640.8		639.90	599.8		
May-13	477.0		294.00	484.8		
Jun-13	539.6		112.40	554.5		
Jul-13	422.4		92.50	429.2		
Aug-13	471.0		98.90	491.7		
Sep-13	435.3		264.30	451.8		
Oct-13	492.6		501.40	504.6		
Nov-13	665.9		865.60	648.2		
Dec-13	732.7	7,107.6	1144.70	679.6	7,137.2	
Jan-14	800.5		745.80	897.9		
Feb-14	664.0		992.40	610.4		
Mar-14	635.7		855.10	616.4		
Apr-14	539.4		499.80	541.7		
May-14	558.1		269.50	573.4		
Jun-14	409.2		200.50	396.9		
Jul-14	393.7		98.00	398.7		
Aug-14	477.3		144.00	484.1		
Sep-14	461.4		307.10	464.7		
Oct-14	561.2		515.60	568.8		
Nov-14	586.5		772.80	597.4		
Dec-14	709.6	6,796.6	854.40	746.1	6,896.5	
Jan-15	896.6		927.00	938.1		
Feb-15	698.5		851.40	688.4		
Mar-15	579.4		671.30	616.9		
Apr-15	605.8		453.50	622.3		
May-15	459.9		192.90	498.9		
Jun-15	437.8		127.20	448.2		
Jul-15	489.7		115.70	489.3		
Aug-15	414.6		183.20	409.2		
Sep-15	490.6		332.70	486.0		
Oct-15	620.9		469.80	642.6		
Nov-15	610.9		759.20	626.0		
Dec-15	685.1	6,989.8	947.90	692.6	7,158.6	
Jan-16	915.1		827.6	987.3		
Feb-16	630.8		688.0	671.2		
Mar-16	593.1		611.6	649.0		
Apr-16	623.3					
May-16	499.6					
Jun-16	448.8					
Jul-16	490.0					
Aug-16	409.9					
Sep-16	486.7					
Oct-16	643.6					
Nov-16	627.0					
Dec-16	693.7	7,061.6			7,230.0	
Jan-17	988.8					
Feb-17	672.2					
Mar-17	650.0					
Apr-17	624.2					
May-17	500.4					
Jun-17	449.5					
Jul-17	490.8					
Aug-17	410.5					
Sep-17	487.4					
Oct-17	644.5					
Nov-17	627.9					
Dec-17	694.7	7,240.8			7,240.8	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (7,158.6 / 7,137.2) ^ {1/2} - 1 = \mathbf{0.1\%}$$

Note: January, February and March 2016 have been updated to include actuals.

**ATCO Electric Yukon
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**Section 2
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Ross River

Residential	Annual		(Whitehorse)	Annual		
	Actual / Forecast	UPC (kWh)		Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	Regression Output:
Jan-95	1151.6		1020.10	1,170.3		SUMMARY OUTPUT
Feb-95	692.9		840.10	683.3		Regression Statistics
Mar-95	613.0		880.00	573.5		Multiple R 0.792515595
Apr-95	659.5		439.90	689.8		R Square 0.628080968
May-95	525.2		250.70	556.1		Adjusted R Square 0.625991536
Jun-95	529.5		139.00	539.3		Standard Error 115.2522598
Jul-95	465.1		96.60	473.2		Observations 180
Aug-95	458.8		198.30	444.1		
Sep-95	538.4		226.50	579.6		ANOVA
Oct-95	561.0		524.90	567.9		
Nov-95	716.8		894.40	677.9		
Dec-95	874.3	7,786.1	1048.60	839.9	7,794.8	
Jan-96	1136.2		1530.10	924.3		
Feb-96	952.9		835.80	945.3		
Mar-96	776.6		805.80	770.7		
Apr-96	786.9		526.00	778.3		
May-96	591.3		357.30	574.0		
Jun-96	546.1		193.60	531.2		
Jul-96	538.4		124.90	533.7		
Aug-96	461.5		227.30	433.7		
Sep-96	600.2		362.60	579.9		
Oct-96	620.3		679.90	557.1		
Nov-96	728.7		975.00	653.3		
Dec-96	890.6	8,629.6	1155.80	807.7	8,089.2	
Jan-97	1259.8		1185.70	1,203.6		
Feb-97	866.9		656.50	940.2		
Mar-97	764.7		855.40	736.3		
Apr-97	694.7		484.00	705.1		
May-97	538.2		331.10	532.7		
Jun-97	505.0		148.90	510.3		
Jul-97	507.3		92.80	517.1		
Aug-97	446.4		130.00	462.6		
Sep-97	557.8		282.10	573.8		
Oct-97	638.7		641.00	593.1		
Nov-97	683.1		685.80	738.4		
Dec-97	646.2	8,108.7	762.00	741.3	8,254.7	
Jan-98	1058.6		1165.70	1,011.4		
Feb-98	802.9		719.10	848.0		
Mar-98	783.0		756.60	799.2		
Apr-98	635.5		458.60	657.4		
May-98	527.6		270.60	549.5		
Jun-98	502.4		119.50	521.0		
Jul-98	553.3		111.60	554.6		
Aug-98	451.0		189.20	440.4		
Sep-98	560.0		327.80	555.4		
Oct-98	567.4		557.70	559.4		
Nov-98	592.3		792.30	599.5		
Dec-98	841.4	7,875.5	1051.80	805.6	7,901.6	
Jan-99	956.0		1183.10	900.9		
Feb-99	798.8		976.40	727.6		
Mar-99	706.7		734.00	733.1		
Apr-99	703.1		508.80	702.3		
May-99	575.7		391.90	542.8		
Jun-99	504.7		153.90	507.7		
Jul-99	581.7		108.60	584.3		
Aug-99	471.9		145.70	481.0		
Sep-99	470.5		311.20	473.4		
Oct-99	640.2		499.80	658.5		
Nov-99	646.8		792.50	653.9		
Dec-99	723.7	7,779.8	844.00	781.7	7,747.4	
Jan-00	962.7		1082.90	953.0		
Feb-00	777.9		735.20	815.7		
Mar-00	678.7		659.20	739.0		
Apr-00	787.7		515.60	783.8		
May-00	514.8		382.00	486.3		
Jun-00	649.7		172.50	644.3		
Jul-00	466.8		142.10	454.3		
Aug-00	475.1		219.70	450.8		
Sep-00	628.0		354.20	611.5		
Oct-00	600.2		537.20	601.5		
Nov-00	615.5		694.20	667.1		
Dec-00	854.2	8,011.3	973.00	854.0	8,061.3	

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Ross River

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	823.9		724.60	976.1		
Feb-01	680.1		864.10	659.7		
Mar-01	846.7		765.30	859.0		
Apr-01	594.4		505.30	595.2		
May-01	579.9		390.40	547.7		
Jun-01	560.1		167.30	557.1		
Jul-01	467.6		139.60	456.2		
Aug-01	431.1		139.60	442.9		
Sep-01	510.8		309.00	514.6		
Oct-01	560.7		573.40	545.7		
Nov-01	734.6		818.00	730.2		
Dec-01	730.5	7,520.3	1094.60	675.3	7,559.7	
Jan-02	822.5		938.10	878.2		
Feb-02	853.7		824.60	851.1		
Mar-02	656.6		921.00	598.6		
Apr-02	665.3		653.30	599.2		
May-02	614.8		361.60	595.6		
Jun-02	447.7		175.60	441.0		
Jul-02	427.7		130.90	420.3		
Aug-02	512.0		182.80	504.3		
Sep-02	414.7		314.40	416.1		
Oct-02	493.8		444.30	537.2		
Nov-02	662.6		582.60	764.6		
Dec-02	621.6	7,193.1	845.10	679.2	7,285.3	
Jan-03	845.1		992.60	876.1		
Feb-03	717.9		756.60	746.0		
Mar-03	629.7		832.20	611.8		
Apr-03	549.6		514.30	546.3		
May-03	560.5		363.70	540.4		
Jun-03	430.8		192.80	416.3		
Jul-03	456.7		84.20	470.3		
Aug-03	386.9		180.60	380.3		
Sep-03	402.8		359.20	384.0		
Oct-03	473.4		466.70	506.6		
Nov-03	675.4		874.60	645.4		
Dec-03	727.1	6,855.7	911.60	754.6	6,878.0	
Jan-04	883.8		1254.00	796.7		
Feb-04	769.4		697.20	824.4		
Mar-04	640.3		753.50	657.9		
Apr-04	685.2		466.60	703.5		
May-04	498.9		272.50	519.9		
Jun-04	453.4		83.70	488.1		
Jul-04	486.8		74.20	505.0		
Aug-04	415.0		101.70	444.0		
Sep-04	538.6		367.50	516.0		
Oct-04	500.0		540.50	499.9		
Nov-04	567.6		719.80	607.6		
Dec-04	714.8	7,153.7	899.50	747.7	7,310.8	
Jan-05	999.0		1165.80	951.8		
Feb-05	829.1		795.20	839.8		
Mar-05	632.6		613.70	713.5		
Apr-05	687.7		453.30	712.0		
May-05	513.2		256.60	541.4		
Jun-05	435.4		154.40	438.3		
Jul-05	489.2		132.60	481.0		
Aug-05	456.9		150.80	463.8		
Sep-05	583.9		299.30	592.2		
Oct-05	496.2		534.60	498.7		
Nov-05	593.0		762.60	613.7		
Dec-05	736.3	7,452.7	794.40	816.7	7,662.8	
Jan-06	960.6		1096.20	944.8		
Feb-06	800.6		821.30	799.5		
Mar-06	697.5		906.30	646.1		
Apr-06	729.5		519.10	724.1		
May-06	556.7		346.90	544.2		
Jun-06	533.0		173.10	527.4		
Jul-06	425.9		118.40	424.2		
Aug-06	393.9		201.60	377.7		
Sep-06	522.3		295.70	532.2		
Oct-06	524.7		520.50	533.6		
Nov-06	688.6		1162.20	528.7		
Dec-06	891.6	7,724.9	824.30	958.5	7,540.8	

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Ross River

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	778.6		912.00	846.0		
Feb-07	714.3		998.80	632.9		
Mar-07	962.6		954.20	889.6		
Apr-07	682.2		486.40	691.5		
May-07	505.2		322.10	503.8		
Jun-07	527.1		140.50	536.2		
Jul-07	421.5		102.30	427.0		
Aug-07	468.9		154.20	474.1		
Sep-07	445.3		308.40	449.5		
Oct-07	563.0		543.70	561.4		
Nov-07	732.8		724.60	770.6		
Dec-07	702.6	7,504.1	1069.50	658.8	7,441.5	
Jan-08	844.1		1113.80	820.4		
Feb-08	1085.5		954.60	1,024.1		
Mar-08	692.2		734.70	718.4		
Apr-08	608.1		517.30	603.5		
May-08	652.2		307.90	657.2		
Jun-08	494.6		225.60	465.2		
Jul-08	506.3		173.40	479.7		
Aug-08	527.4		187.70	517.5		
Sep-08	571.0		318.70	570.5		
Oct-08	557.1		563.00	546.8		
Nov-08	809.4		782.50	821.1		
Dec-08	767.0	8,114.9	1186.20	670.3	7,894.7	
Jan-09	1265.6		1137.90	1,231.0		
Feb-09	802.2		955.40	740.5		
Mar-09	805.6		868.50	771.3		
Apr-09	683.9		515.20	680.2		
May-09	677.9		331.20	672.4		
Jun-09	569.6		144.10	577.0		
Jul-09	595.7		62.50	619.2		
Aug-09	539.0		158.30	542.4		
Sep-09	432.4		306.10	437.6		
Oct-09	701.9		541.80	701.2		
Nov-09	620.2		781.50	632.2		
Dec-09	850.6	8,544.4	955.20	858.3	8,463.3	
Jan-10	1055.4		991.10	1,087.1		
Feb-10	770.5		679.20	833.6		
Mar-10	660.6		656.00	722.3		
Apr-10	750.0		461.20	770.7		
May-10	552.0		292.00	564.3		
Jun-10	526.6		171.90	521.5		
Jul-10	564.0		117.30	562.8		
Aug-10	480.9		146.20	489.8		
Sep-10	604.3		332.40	597.6		
Oct-10	586.3		520.40	595.2		
Nov-10	657.4		717.60	698.4		
Dec-10	957.4	8,165.4	1162.50	871.5	8,314.7	
Jan-11	1094.7		1010.20	1,117.8		
Feb-11	955.4		905.60	916.1		
Mar-11	955.0		901.70	905.7		
Apr-11	885.9		511.20	884.0		
May-11	651.5		296.40	661.8		
Jun-11	541.4		161.00	541.2		
Jul-11	561.7		127.80	555.7		
Aug-11	498.9		217.90	475.3		
Sep-11	623.1		328.50	618.2		
Nov-11	596.9		513.30	609.0		
Nov-11	642.8		931.70	587.0		
Dec-11	965.3	8,972.5	775.10	1,054.5	8,926.4	
Jan-12	1092.2		1118.10	1,066.5		
Feb-12	980.5		691.70	1,037.9		
Mar-12	973.3		756.20	989.7		
Apr-12	710.7		450.60	736.2		
May-12	586.1		350.80	571.7		
Jun-12	641.2		195.10	625.6		
Jul-12	503.5		140.10	491.9		
Aug-12	525.9		157.90	529.5		
Sep-12	506.9		271.00	528.0		
Oct-12	559.6		639.30	514.9		
Nov-12	904.7		969.60	831.8		
Dec-12	984.6	8,969.2	1196.80	883.2	8,807.0	

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Ross River

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,112.2		952.00	1,161.6		
Feb-13	1,051.8		665.40	1,121.1		
Mar-13	835.5		851.10	809.0		
Apr-13	806.5		639.90	746.4		
May-13	626.8		294.00	638.1		
Jun-13	618.2		112.40	640.0		
Jul-13	460.1		92.50	470.0		
Aug-13	642.4		98.90	672.7		
Sep-13	331.5		264.30	355.6		
Oct-13	579.6		501.40	597.2		
Nov-13	872.3		865.60	846.4		
Dec-13	897.2	8,834.1	1144.70	819.4	8,877.5	
Jan-14	1,097.8		745.80	1,240.4		
Feb-14	994.6		992.40	916.2		
Mar-14	926.4		855.10	898.2		
Apr-14	683.3		499.80	686.6		
May-14	717.1		269.50	739.5		
Jun-14	508.4		200.50	490.4		
Jul-14	426.7		98.00	434.2		
Aug-14	586.3		144.00	596.2		
Sep-14	531.9		307.10	536.7		
Oct-14	740.6		515.60	751.7		
Nov-14	788.5		772.80	804.5		
Dec-14	934.7	8,936.3	854.40	988.0	9,082.4	
Jan-15	1,159.3		927.00	1,220.0		
Feb-15	1,035.1		851.40	1,020.4		
Mar-15	893.2		671.30	948.0		
Apr-15	774.4		453.50	798.6		
May-15	561.6		192.90	618.6		
Jun-15	453.7		127.20	468.8		
Jul-15	493.0		115.70	492.4		
Aug-15	442.1		183.20	434.2		
Sep-15	518.4		332.70	511.6		
Oct-15	680.5		469.80	712.3		
Nov-15	727.1		759.20	749.2		
Dec-15	749.9	8,488.3	947.90	760.9	8,735.3	
Jan-16	1,083.6		827.6	1,189.2		
Feb-16	781.4		688.0	840.5		
Mar-16	772.3		611.6	854.1		
Apr-16	792.2					
May-16	613.7					
Jun-16	465.0					
Jul-16	488.4					
Aug-16	430.7					
Sep-16	507.4					
Oct-16	706.6					
Nov-16	743.2					
Dec-16	754.8	8,139.5			8,386.0	
Jan-17	1,179.7					
Feb-17	833.8					
Mar-17	847.3					
Apr-17	785.8					
May-17	608.7					
Jun-17	461.3					
Jul-17	484.5					
Aug-17	427.3					
Sep-17	503.4					
Oct-17	700.9					
Nov-17	737.2					
Dec-17	748.7	8,318.6			8,318.6	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (8,735.3 / 8,877.5) ^ {(1/2)} - 1 = \quad \quad \quad \mathbf{-0.8\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Pelly Crossing

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	1035.6		1020.10	1,055.3		SUMMARY OUTPUT
Feb-95	799.3		840.10	789.1		Regression Statistics
Mar-95	765.8		880.00	723.9		Multiple R 0.786768353
Apr-95	683.0		439.90	715.2		R Square 0.619004441
May-95	729.8		250.70	762.6		Adjusted R Square 0.616864017
Jun-95	568.6		139.00	579.0		Standard Error 124.7316283
Jul-95	496.2		96.60	504.8		Observations 180
Aug-95	581.8		198.30	566.2		
Sep-95	621.6		226.50	665.3		ANOVA
Oct-95	698.5		524.90	705.9		
Nov-95	820.9		894.40	779.6		
Dec-95	891.2	8,692.3	1048.60	854.7	8,701.5	
Jan-96	1109.0		1530.10	884.1		
Feb-96	857.5		835.80	849.4		
Mar-96	755.5		805.80	749.2		
Apr-96	739.7		526.00	730.6		
May-96	631.3		357.30	613.0		
Jun-96	581.2		193.60	565.5		
Jul-96	596.5		124.90	591.5		
Aug-96	572.8		227.30	543.3		
Sep-96	689.3		362.60	667.8		
Oct-96	669.4		679.90	602.4		
Nov-96	867.0		975.00	787.0		
Dec-96	907.7	8,977.2	1155.80	819.8	8,403.6	
Jan-97	1154.4		1185.70	1,094.7		
Feb-97	855.8		656.50	933.7		
Mar-97	765.8		855.40	735.7		
Apr-97	785.8		484.00	796.8		
May-97	657.1		331.10	651.3		
Jun-97	638.2		148.90	643.8		
Jul-97	517.1		92.80	527.5		
Aug-97	528.5		130.00	545.7		
Sep-97	655.6		282.10	672.7		
Oct-97	696.9		641.00	648.6		
Nov-97	767.8		685.80	826.5		
Dec-97	736.2	8,759.3	762.00	837.2	8,914.2	
Jan-98	1086.5		1165.70	1,036.5		
Feb-98	894.5		719.10	942.4		
Mar-98	698.5		756.60	715.7		
Apr-98	734.5		458.60	757.8		
May-98	712.5		270.60	735.8		
Jun-98	521.8		119.50	541.5		
Jul-98	523.5		111.60	524.9		
Aug-98	585.0		189.20	573.8		
Sep-98	613.5		327.80	608.6		
Oct-98	783.3		557.70	774.9		
Nov-98	715.7		792.30	723.3		
Dec-98	891.6	8,761.1	1051.80	853.5	8,788.8	
Jan-99	1202.8		1183.10	1,144.4		
Feb-99	867.9		976.40	792.3		
Mar-99	786.0		734.00	814.1		
Apr-99	874.2		508.80	873.4		
May-99	651.9		391.90	617.0		
Jun-99	572.3		153.90	575.6		
Jul-99	644.5		108.60	647.3		
Aug-99	563.7		145.70	573.4		
Sep-99	670.9		311.20	673.9		
Oct-99	854.5		499.80	873.9		
Nov-99	779.7		792.50	787.3		
Dec-99	833.3	9,301.8	844.00	894.9	9,267.5	
Jan-00	1247.4		1082.90	1,237.0		
Feb-00	838.8		735.20	878.9		
Mar-00	812.3		659.20	876.3		
Apr-00	899.9		515.60	895.7		
May-00	691.8		382.00	661.6		
Jun-00	714.6		172.50	709.0		
Jul-00	584.6		142.10	571.3		
Aug-00	613.1		219.70	587.3		
Sep-00	787.6		354.20	770.0		
Oct-00	748.5		537.20	750.0		
Nov-00	942.5		694.20	997.2		
Dec-00	704.0	9,585.0	973.00	703.7	9,638.0	

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Pelly Crossing

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	UPC (kWh)	UPC (kWh)	
Jan-01	999.2		724.60	1,160.8	
Feb-01	825.9		864.10	804.2	
Mar-01	905.0		765.30	918.1	
Apr-01	691.2		505.30	692.0	
May-01	684.1		390.40	649.9	
Jun-01	647.4		167.30	644.2	
Jul-01	575.8		139.60	563.8	
Aug-01	501.9		139.60	514.5	
Sep-01	713.1		309.00	717.3	
Oct-01	673.2		573.40	657.3	
Nov-01	926.8		818.00	922.1	
Dec-01	859.9	9,003.6	1094.60	801.3	9,045.4
Jan-02	1107.6		938.10	1,166.7	
Feb-02	1065.1		824.60	1,062.3	
Mar-02	774.4		921.00	712.8	
Apr-02	748.7		653.30	678.5	
May-02	768.5		361.60	748.1	
Jun-02	532.4		175.60	525.2	
Jul-02	550.7		130.90	542.8	
Aug-02	688.7		182.80	680.6	
Sep-02	661.1		314.40	662.7	
Oct-02	692.2		444.30	738.2	
Nov-02	698.1		582.60	806.3	
Dec-02	867.8	9,155.2	845.10	928.8	9,253.0
Jan-03	871.4		992.60	904.4	
Feb-03	804.1		756.60	834.0	
Mar-03	769.3		832.20	750.3	
Apr-03	727.6		514.30	724.1	
May-03	770.3		363.70	748.9	
Jun-03	580.7		192.80	565.3	
Jul-03	643.8		84.20	658.4	
Aug-03	595.1		180.60	588.0	
Sep-03	655.1		359.20	635.2	
Oct-03	783.9		466.70	819.1	
Nov-03	782.4		874.60	750.6	
Dec-03	1061.7	9,045.5	911.60	1,090.9	9,069.1
Jan-04	1003.8		1254.00	911.4	
Feb-04	822.8		697.20	881.2	
Mar-04	780.7		753.50	799.4	
Apr-04	883.0		466.60	902.4	
May-04	642.9		272.50	665.2	
Jun-04	674.8		83.70	711.8	
Jul-04	592.9		74.20	612.2	
Aug-04	558.7		101.70	589.5	
Sep-04	654.0		367.50	630.1	
Oct-04	809.2		540.50	809.0	
Nov-04	861.1		719.80	903.5	
Dec-04	724.3	9,008.3	899.50	759.3	9,175.0
Jan-05	1183.8		1165.80	1,133.7	
Feb-05	909.4		795.20	920.7	
Mar-05	731.0		613.70	816.8	
Apr-05	848.2		453.30	874.0	
May-05	639.0		256.60	669.0	
Jun-05	703.2		154.40	706.2	
Jul-05	533.4		132.60	524.7	
Aug-05	593.3		150.80	600.5	
Sep-05	749.1		299.30	757.9	
Oct-05	657.9		534.60	660.6	
Nov-05	769.3		762.60	791.2	
Dec-05	817.1	9,134.7	794.40	902.5	9,357.8
Jan-06	1146.8		1096.20	1,130.1	
Feb-06	759.3		821.30	758.1	
Mar-06	966.3		906.30	911.7	
Apr-06	678.3		519.10	672.5	
May-06	665.2		346.90	651.8	
Jun-06	667.4		173.10	661.4	
Jul-06	558.6		118.40	556.8	
Aug-06	509.8		201.60	492.6	
Sep-06	730.7		295.70	741.2	
Oct-06	681.2		520.50	690.6	
Nov-06	848.4		1162.20	678.6	
Dec-06	915.1	9,127.0	824.30	986.1	8,931.6

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Pelly Crossing

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1169.0		912.00	1,240.6		
Feb-07	871.6		998.80	785.2		
Mar-07	1033.2		954.20	955.7		
Apr-07	692.5		486.40	702.4		
May-07	721.8		322.10	720.4		
Jun-07	656.8		140.50	666.5		
Jul-07	450.6		102.30	456.4		
Aug-07	729.1		154.20	734.7		
Sep-07	579.5		308.40	583.9		
Oct-07	684.5		543.70	682.8		
Nov-07	929.3		724.60	969.5		
Dec-07	732.5	9,250.4	1069.50	686.0	9,184.0	
Jan-08	1142.5		1113.80	1,117.3		
Feb-08	1287.0		954.60	1,221.8		
Mar-08	958.3		734.70	986.1		
Apr-08	575.5		517.30	570.6		
May-08	810.3		307.90	815.7		
Jun-08	608.3		225.60	577.2		
Jul-08	440.4		173.40	412.2		
Aug-08	623.1		187.70	612.7		
Sep-08	567.8		318.70	567.3		
Oct-08	735.6		563.00	724.7		
Nov-08	807.3		782.50	819.6		
Dec-08	884.5	9,440.7	1186.20	781.9	9,207.1	
Jan-09	1349.7		1137.90	1,312.9		
Feb-09	1030.3		955.40	964.8		
Mar-09	1005.6		868.50	969.2		
Apr-09	692.2		515.20	688.3		
May-09	715.7		331.20	709.9		
Jun-09	547.0		144.10	555.0		
Jul-09	606.0		62.50	630.9		
Aug-09	534.7		158.30	538.3		
Sep-09	619.2		306.10	624.8		
Oct-09	840.6		541.80	839.8		
Nov-09	863.8		781.50	876.6		
Dec-09	924.3	9,729.1	955.20	932.5	9,643.0	
Jan-10	972.8		991.10	1,006.5		
Feb-10	825.4		679.20	892.4		
Mar-10	777.2		656.00	842.7		
Apr-10	824.6		461.20	846.6		
May-10	680.6		292.00	693.6		
Jun-10	551.5		171.90	546.1		
Jul-10	751.6		117.30	750.2		
Aug-10	519.9		146.20	529.4		
Sep-10	692.3		332.40	685.2		
Oct-10	693.9		520.40	703.4		
Nov-10	773.8		717.60	817.3		
Dec-10	836.2	8,899.8	1162.50	745.0	9,058.3	
Jan-11	1250.8		1010.20	1,275.3		
Feb-11	924.1		905.60	882.5		
Mar-11	905.2		901.70	852.9		
Apr-11	759.9		511.20	757.9		
May-11	764.9		296.40	775.7		
Jun-11	544.8		161.00	544.7		
Jul-11	642.5		127.80	636.1		
Aug-11	593.5		217.90	568.6		
Sep-11	714.3		328.50	709.1		
Nov-11	677.9		513.30	690.8		
Nov-11	890.4		931.70	831.1		
Dec-11	942.5	9,610.8	775.10	1,037.1	9,561.8	
Jan-12	1316.4		1118.10	1,289.2		
Feb-12	897.9		691.70	958.9		
Mar-12	1081.4		756.20	1,098.9		
Apr-12	597.9		450.60	624.9		
May-12	702.2		350.80	687.0		
Jun-12	799.2		195.10	782.7		
Jul-12	444.1		140.10	431.8		
Aug-12	650.1		157.90	653.9		
Sep-12	633.4		271.00	655.8		
Oct-12	724.4		639.30	676.9		
Nov-12	1161.9		969.60	1,084.5		
Dec-12	1135.9	10,144.9	1196.80	1,028.2	9,972.7	

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Pelly Crossing

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,184.6		952.00	1,237.0		
Feb-13	1,016.8		665.40	1,090.4		
Mar-13	907.0		851.10	878.9		
Apr-13	1,039.8		639.90	976.0		
May-13	877.2		294.00	889.2		
Jun-13	564.2		112.40	587.3		
Jul-13	606.9		92.50	617.4		
Aug-13	656.8		98.90	688.9		
Sep-13	667.4		264.30	693.0		
Oct-13	905.7		501.40	924.4		
Nov-13	940.4		865.60	912.9		
Dec-13	943.7	10,310.4	1144.70	861.0	10,356.5	
Jan-14	1,579.6		745.80	1,731.0		
Feb-14	1,191.5		992.40	1,108.3		
Mar-14	969.4		855.10	939.4		
Apr-14	868.5		499.80	872.0		
May-14	822.2		269.50	846.0		
Jun-14	627.2		200.50	608.1		
Jul-14	623.7		98.00	631.6		
Aug-14	636.8		144.00	647.3		
Sep-14	747.6		307.10	752.6		
Oct-14	920.4		515.60	932.2		
Nov-14	911.2		772.80	928.2		
Dec-14	1,263.7	11,162.0	854.40	1,320.3	11,317.0	
Jan-15	1,147.2		927.00	1,211.6		
Feb-15	1,015.8		851.40	1,000.1		
Mar-15	953.5		671.30	1,011.7		
Apr-15	883.2		453.50	908.9		
May-15	562.3		192.90	622.9		
Jun-15	593.2		127.20	609.3		
Jul-15	635.5		115.70	634.9		
Aug-15	561.8		183.20	553.5		
Sep-15	677.3		332.70	670.1		
Oct-15	830.3		469.80	864.1		
Nov-15	941.7		759.20	965.2		
Dec-15	1,288.1	10,089.8	947.90	1,299.8	10,352.0	
Jan-16	844.5		827.6	956.6		
Feb-16	901.4		688.0	964.2		
Mar-16	756.7		611.6	843.6		
Apr-16	908.7					
May-16	622.7					
Jun-16	609.1					
Jul-16	634.8					
Aug-16	553.3					
Sep-16	670.0					
Oct-16	863.9					
Nov-16	965.0					
Dec-16	1,299.6	9,629.6			9,891.3	
Jan-17	956.4					
Feb-17	963.9					
Mar-17	843.4					
Apr-17	908.5					
May-17	622.6					
Jun-17	609.0					
Jul-17	634.6					
Aug-17	553.2					
Sep-17	669.8					
Oct-17	863.7					
Nov-17	964.8					
Dec-17	1,299.3	9,889.1			9,889.1	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (10,352.0 / 10,356.5) ^ {(1/2)} - 1 = \quad \mathbf{0.0\%}$$

Note: January, February and March 2016 have been updated to include actuals.

**ATCO Electric Yukon
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**Section 2
Attachment 8**

Old Crow

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	589.5		1020.10	600.9		SUMMARY OUTPUT
Feb-95	718.2		840.10	712.3		Regression Statistics
Mar-95	508.5		880.00	484.2		Multiple R 0.674532825
Apr-95	516.0		439.90	534.6		R Square 0.454994533
May-95	550.2		250.70	569.1		Adjusted R Square 0.451932704
Jun-95	519.8		139.00	525.8		Standard Error 100.6961307
Jul-95	360.5		96.60	365.5		Observations 180
Aug-95	373.4		198.30	364.4		
Sep-95	466.9		226.50	492.2		ANOVA
Oct-95	434.4		524.90	438.7		
Nov-95	559.1		894.40	535.1		
Dec-95	652.5	6,248.9	1048.60	631.4	6,254.2	
Jan-96	818.8		1530.10	688.7		
Feb-96	583.9		835.80	579.2		
Mar-96	531.8		805.80	528.1		
Apr-96	602.5		526.00	597.2		
May-96	448.9		357.30	438.3		
Jun-96	374.0		193.60	364.9		
Jul-96	491.1		124.90	488.2		
Aug-96	398.4		227.30	381.4		
Sep-96	618.0		362.60	605.5		
Oct-96	252.8		679.90	214.0		
Nov-96	567.4		975.00	521.1		
Dec-96	648.6	6,336.1	1155.80	597.7	6,004.1	
Jan-97	896.5		1185.70	862.0		
Feb-97	643.4		656.50	688.5		
Mar-97	641.3		855.40	623.9		
Apr-97	647.8		484.00	654.2		
May-97	479.6		331.10	476.3		
Jun-97	476.6		148.90	479.9		
Jul-97	460.2		92.80	466.2		
Aug-97	504.7		130.00	514.7		
Sep-97	586.7		282.10	596.6		
Oct-97	463.2		641.00	435.2		
Nov-97	571.6		685.80	605.6		
Dec-97	633.2	7,004.9	762.00	691.7	7,094.6	
Jan-98	874.6		1165.70	845.6		
Feb-98	636.3		719.10	664.0		
Mar-98	680.8		756.60	690.8		
Apr-98	495.4		458.60	508.8		
May-98	543.5		270.60	556.9		
Jun-98	480.2		119.50	491.6		
Jul-98	210.7		111.60	211.5		
Aug-98	585.2		189.20	578.7		
Sep-98	489.6		327.80	486.8		
Oct-98	562.9		557.70	558.1		
Nov-98	515.4		792.30	519.8		
Dec-98	631.4	6,705.8	1051.80	609.4	6,721.9	
Jan-99	759.0		1183.10	725.2		
Feb-99	605.3		976.40	561.6		
Mar-99	597.3		734.00	613.6		
Apr-99	685.9		508.80	685.4		
May-99	459.3		391.90	439.1		
Jun-99	441.7		153.90	443.6		
Jul-99	535.1		108.60	536.7		
Aug-99	448.8		145.70	454.4		
Sep-99	439.7		311.20	441.5		
Oct-99	647.7		499.80	658.9		
Nov-99	581.7		792.50	586.1		
Dec-99	648.9	6,850.3	844.00	684.5	6,830.5	
Jan-00	903.4		1082.90	897.4		
Feb-00	652.5		735.20	675.7		
Mar-00	772.3		659.20	809.3		
Apr-00	471.8		515.60	469.4		
May-00	572.9		382.00	555.4		
Jun-00	603.8		172.50	600.5		
Jul-00	426.6		142.10	419.0		
Aug-00	432.4		219.70	417.5		
Sep-00	466.6		354.20	456.5		
Oct-00	611.9		537.20	612.7		
Nov-00	504.5		694.20	536.2		
Dec-00	672.9	7,091.6	973.00	672.8	7,122.3	

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Old Crow

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Annual Normalized UPC (kWh)	Regression Output:
	UPC (kWh)	UPC (kWh)			
Jan-01	719.8		724.60	813.3	
Feb-01	591.7		864.10	579.1	
Mar-01	657.7		765.30	665.3	
Apr-01	607.2		505.30	607.7	
May-01	573.7		390.40	553.9	
Jun-01	456.5		167.30	454.6	
Jul-01	434.0		139.60	427.0	
Aug-01	398.6		139.60	405.9	
Sep-01	494.6		309.00	497.0	
Oct-01	429.2		573.40	420.0	
Nov-01	551.2		818.00	548.5	
Dec-01	542.0	6,456.3	1094.60	508.1	6,480.4
Jan-02	653.9		938.10	688.1	
Feb-02	715.9		824.60	714.3	
Mar-02	540.6		921.00	505.0	
Apr-02	525.1		653.30	484.5	
May-02	536.5		361.60	524.7	
Jun-02	393.6		175.60	389.5	
Jul-02	435.0		130.90	430.4	
Aug-02	508.2		182.80	503.5	
Sep-02	417.1		314.40	418.0	
Oct-02	461.6		444.30	488.2	
Nov-02	635.5		582.60	698.1	
Dec-02	557.3	6,380.2	845.10	592.6	6,436.8
Jan-03	783.9		992.60	803.0	
Feb-03	655.3		756.60	672.6	
Mar-03	621.2		832.20	610.2	
Apr-03	590.6		514.30	588.5	
May-03	558.9		363.70	546.5	
Jun-03	457.1		192.80	448.2	
Jul-03	504.7		84.20	513.1	
Aug-03	409.0		180.60	404.9	
Sep-03	463.8		359.20	452.2	
Oct-03	432.3		466.70	452.7	
Nov-03	528.0		874.60	509.6	
Dec-03	638.9	6,643.6	911.60	655.8	6,657.3
Jan-04	792.4		1254.00	738.9	
Feb-04	655.4		697.20	689.1	
Mar-04	667.9		753.50	678.7	
Apr-04	590.6		466.60	601.8	
May-04	555.4		272.50	568.4	
Jun-04	477.7		83.70	499.1	
Jul-04	485.2		74.20	496.3	
Aug-04	444.8		101.70	462.6	
Sep-04	390.1		367.50	376.2	
Oct-04	546.4		540.50	546.4	
Nov-04	588.9		719.80	613.5	
Dec-04	624.3	6,819.1	899.50	644.6	6,915.6
Jan-05	900.6		1165.80	871.6	
Feb-05	686.8		795.20	693.3	
Mar-05	690.7		613.70	740.4	
Apr-05	737.8		453.30	752.8	
May-05	537.0		256.60	554.4	
Jun-05	454.7		154.40	456.4	
Jul-05	499.6		132.60	494.6	
Aug-05	481.4		150.80	485.6	
Sep-05	468.6		299.30	473.7	
Oct-05	581.1		534.60	582.6	
Nov-05	555.4		762.60	568.1	
Dec-05	647.5	7,241.4	794.40	696.9	7,370.5
Jan-06	856.2		1096.20	846.5	
Feb-06	730.7		821.30	730.0	
Mar-06	645.0		906.30	613.4	
Apr-06	720.5		519.10	717.1	
May-06	589.1		346.90	581.4	
Jun-06	512.4		173.10	509.0	
Jul-06	437.9		118.40	436.8	
Aug-06	422.4		201.60	412.4	
Sep-06	562.1		295.70	568.2	
Oct-06	463.3		520.50	468.7	
Nov-06	468.8		1162.20	370.6	
Dec-06	743.2	7,151.5	824.30	784.3	7,038.4

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Old Crow

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	755.0		912.00	796.5		
Feb-07	663.6		998.80	613.6		
Mar-07	762.9		954.20	718.0		
Apr-07	651.8		486.40	657.5		
May-07	509.3		322.10	508.5		
Jun-07	546.6		140.50	552.2		
Jul-07	441.9		102.30	445.3		
Aug-07	392.8		154.20	396.0		
Sep-07	529.7		308.40	532.3		
Oct-07	464.2		543.70	463.2		
Nov-07	646.9		724.60	670.1		
Dec-07	626.9	6,991.5	1069.50	599.9	6,953.1	
Jan-08	695.3		1113.80	680.7		
Feb-08	795.4		954.60	757.7		
Mar-08	587.2		734.70	603.2		
Apr-08	571.6		517.30	568.8		
May-08	549.5		307.90	552.6		
Jun-08	559.9		225.60	541.9		
Jul-08	399.5		173.40	383.2		
Aug-08	533.2		187.70	527.2		
Sep-08	447.7		318.70	447.4		
Oct-08	409.5		563.00	403.1		
Nov-08	634.0		782.50	641.2		
Dec-08	560.6	6,743.4	1186.20	501.2	6,608.1	
Jan-09	860.8		1137.90	839.5		
Feb-09	643.4		955.40	605.5		
Mar-09	645.3		868.50	624.2		
Apr-09	648.6		515.20	646.3		
May-09	594.3		331.20	590.9		
Jun-09	494.4		144.10	499.0		
Jul-09	520.2		62.50	534.7		
Aug-09	407.7		158.30	409.8		
Sep-09	425.8		306.10	429.0		
Oct-09	592.4		541.80	592.0		
Nov-09	637.1		781.50	644.5		
Dec-09	586.5	7,056.5	955.20	591.2	7,006.7	
Jan-10	815.7		991.10	835.2		
Feb-10	685.3		679.20	724.0		
Mar-10	633.7		656.00	671.6		
Apr-10	750.6		461.20	763.3		
May-10	485.4		292.00	492.9		
Jun-10	442.0		171.90	438.9		
Jul-10	506.1		117.30	505.3		
Aug-10	413.7		146.20	419.2		
Sep-10	472.2		332.40	468.1		
Oct-10	596.0		520.40	601.5		
Nov-10	567.5		717.60	592.7		
Dec-10	637.9	7,006.1	1162.50	585.2	7,097.9	
Jan-11	1044.0		1010.20	1,058.2		
Feb-11	764.5		905.60	740.4		
Mar-11	684.5		901.70	654.2		
Apr-11	877.3		511.20	876.1		
May-11	686.3		296.40	692.5		
Jun-11	459.0		161.00	458.9		
Jul-11	549.0		127.80	545.3		
Aug-11	454.2		217.90	439.7		
Sep-11	523.5		328.50	520.5		
Nov-11	507.8		513.30	515.3		
Nov-11	573.7		931.70	539.4		
Dec-11	812.0	7,935.7	775.10	866.8	7,907.4	
Jan-12	787.3		1118.10	771.6		
Feb-12	730.7		691.70	766.0		
Mar-12	835.5		756.20	845.6		
Apr-12	661.6		450.60	677.3		
May-12	566.8		350.80	558.0		
Jun-12	588.8		195.10	579.2		
Jul-12	435.4		140.10	428.3		
Aug-12	586.8		157.90	589.0		
Sep-12	343.6		271.00	356.6		
Oct-12	499.0		639.30	471.5		
Nov-12	646.0		969.60	601.2		
Dec-12	785.2	7,466.7	1196.80	722.9	7,367.1	

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Old Crow

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	819.8		952.00	850.1		
Feb-13	900.1		665.40	942.7		
Mar-13	725.9		851.10	709.6		
Apr-13	676.2		639.90	639.3		
May-13	606.9		294.00	613.8		
Jun-13	630.1		112.40	643.5		
Jul-13	427.0		92.50	433.1		
Aug-13	473.0		98.90	491.6		
Sep-13	493.8		264.30	508.6		
Oct-13	615.3		501.40	626.1		
Nov-13	685.1		865.60	669.2		
Dec-13	727.7	7,781.0	1144.70	679.9	7,807.6	
Jan-14	985.8		745.80	1,073.4		
Feb-14	705.6		992.40	657.4		
Mar-14	812.8		855.10	795.5		
Apr-14	707.5		499.80	709.5		
May-14	705.7		269.50	719.4		
Jun-14	494.4		200.50	483.3		
Jul-14	622.2		98.00	626.8		
Aug-14	419.2		144.00	425.3		
Sep-14	358.7		307.10	361.6		
Oct-14	607.7		515.60	614.5		
Nov-14	662.8		772.80	672.6		
Dec-14	765.7	7,848.1	854.40	798.5	7,937.9	
Jan-15	956.9		927.00	994.1		
Feb-15	789.9		851.40	780.8		
Mar-15	862.2		671.30	895.9		
Apr-15	770.1		453.50	784.9		
May-15	537.8		192.90	572.9		
Jun-15	443.5		127.20	452.8		
Jul-15	498.8		115.70	498.5		
Aug-15	436.9		183.20	432.0		
Sep-15	550.7		332.70	546.6		
Oct-15	532.7		469.80	552.3		
Nov-15	615.7		759.20	629.3		
Dec-15	667.8	7,662.9	947.90	674.6	7,814.6	
Jan-16	849.1		827.6	913.9		
Feb-16	715.3		688.0	751.6		
Mar-16	717.3		611.6	767.5		
Apr-16	785.3					
May-16	573.1					
Jun-16	453.0					
Jul-16	498.7					
Aug-16	432.2					
Sep-16	546.8					
Oct-16	552.5					
Nov-16	629.6					
Dec-16	674.9	7,427.7			7,579.1	
Jan-17	914.4					
Feb-17	751.9					
Mar-17	767.9					
Apr-17	785.6					
May-17	573.4					
Jun-17	453.2					
Jul-17	498.9					
Aug-17	432.4					
Sep-17	547.0					
Oct-17	552.8					
Nov-17	629.9					
Dec-17	675.2	7,582.5			7,582.5	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (7,814.6 / 7,807.6) ^ (1/2) - 1 = 0.0%

Note: January, February and March 2016 have been updated to include actuals.

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Destruction Bay

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	723.8		1020.10	734.4		SUMMARY OUTPUT
Feb-95	499.3		840.10	493.8		Regression Statistics
Mar-95	614.8		880.00	592.4		Multiple R 0.704901945
Apr-95	483.6		439.90	500.7		R Square 0.496886752
May-95	494.8		250.70	512.2		Adjusted R Square 0.494060273
Jun-95	427.4		139.00	432.9		Standard Error 85.17439369
Jul-95	413.3		96.60	417.9		Observations 180
Aug-95	450.7		198.30	442.4		
Sep-95	447.2		226.50	470.4		ANOVA
Oct-95	428.4		524.90	432.3		
Nov-95	473.4		894.40	451.4		
Dec-95	579.0	6,035.6	1048.60	559.5	6,040.5	
Jan-96	701.0		1530.10	581.3		
Feb-96	640.6		835.80	636.3		
Mar-96	504.5		805.80	501.1		
Apr-96	507.6		526.00	502.8		
May-96	408.0		357.30	398.2		
Jun-96	424.1		193.60	415.7		
Jul-96	399.2		124.90	396.5		
Aug-96	482.3		227.30	466.6		
Sep-96	453.6		362.60	442.1		
Oct-96	441.9		679.90	406.2		
Nov-96	486.6		975.00	444.0		
Dec-96	505.0	5,954.3	1155.80	458.2	5,648.9	
Jan-97	722.3		1185.70	690.5		
Feb-97	641.0		656.50	682.4		
Mar-97	280.9		855.40	264.8		
Apr-97	456.7		484.00	462.6		
May-97	428.4		331.10	425.3		
Jun-97	396.9		148.90	399.9		
Jul-97	407.2		92.80	412.8		
Aug-97	357.9		130.00	367.1		
Sep-97	474.8		282.10	483.8		
Oct-97	412.6		641.00	386.8		
Nov-97	494.7		685.80	526.0		
Dec-97	490.0	5,563.3	762.00	543.7	5,645.8	
Jan-98	659.5		1165.70	632.8		
Feb-98	485.5		719.10	511.0		
Mar-98	519.3		756.60	528.5		
Apr-98	426.2		458.60	438.5		
May-98	407.4		270.60	419.8		
Jun-98	391.1		119.50	401.7		
Jul-98	390.9		111.60	391.6		
Aug-98	376.4		189.20	370.4		
Sep-98	419.4		327.80	416.8		
Oct-98	434.9		557.70	430.4		
Nov-98	467.7		792.30	471.8		
Dec-98	381.3	5,359.5	1051.80	361.0	5,374.3	
Jan-99	556.8		1183.10	525.7		
Feb-99	538.0		976.40	497.8		
Mar-99	528.3		734.00	543.3		
Apr-99	454.1		508.80	453.7		
May-99	372.0		391.90	353.4		
Jun-99	392.6		153.90	394.4		
Jul-99	444.4		108.60	445.9		
Aug-99	361.4		145.70	366.5		
Sep-99	427.5		311.20	429.2		
Oct-99	443.0		499.80	453.3		
Nov-99	486.8		792.50	490.8		
Dec-99	457.6	5,462.5	844.00	490.4	5,444.3	
Jan-00	659.6		1082.90	654.1		
Feb-00	429.7		735.20	451.1		
Mar-00	459.5		659.20	493.6		
Apr-00	425.5		515.60	423.3		
May-00	459.1		382.00	443.0		
Jun-00	439.9		172.50	436.9		
Jul-00	460.8		142.10	453.7		
Aug-00	421.7		219.70	408.0		
Sep-00	417.6		354.20	408.3		
Oct-00	463.9		537.20	464.6		
Nov-00	495.4		694.20	524.6		
Dec-00	597.3	5,730.0	973.00	597.2	5,758.2	

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Destruction Bay

Residential Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	459.6		724.60	545.6		
Feb-01	424.7		864.10	413.1		
Mar-01	478.1		765.30	485.1		
Apr-01	416.7		505.30	417.1		
May-01	479.8		390.40	461.6		
Jun-01	500.0		167.30	498.3		
Jul-01	430.6		139.60	424.2		
Aug-01	407.8		139.60	414.5		
Sep-01	465.5		309.00	467.7		
Oct-01	467.7		573.40	459.2		
Nov-01	492.5		818.00	490.0		
Dec-01	585.1	5,608.0	1094.60	553.9	5,630.3	
Jan-02	652.6		938.10	684.0		
Feb-02	543.7		824.60	542.3		
Mar-02	535.0		921.00	502.2		
Apr-02	602.7		653.30	565.4		
May-02	465.0		361.60	454.2		
Jun-02	415.0		175.60	411.2		
Jul-02	475.0		130.90	470.8		
Aug-02	427.5		182.80	423.2		
Sep-02	474.0		314.40	474.8		
Oct-02	499.5		444.30	524.0		
Nov-02	569.9		582.60	627.5		
Dec-02	502.0	6,162.0	845.10	534.5	6,214.1	
Jan-03	650.4		992.60	667.9		
Feb-03	459.6		756.60	475.5		
Mar-03	509.7		832.20	499.6		
Apr-03	427.0		514.30	425.2		
May-03	417.9		363.70	406.5		
Jun-03	457.0		192.80	448.8		
Jul-03	419.9		84.20	427.6		
Aug-03	405.1		180.60	401.3		
Sep-03	497.6		359.20	487.0		
Oct-03	431.6		466.70	450.4		
Nov-03	551.1		874.60	534.1		
Dec-03	641.7	5,868.5	911.60	657.2	5,881.1	
Jan-04	553.9		1254.00	504.7		
Feb-04	588.6		697.20	619.7		
Mar-04	545.3		753.50	555.3		
Apr-04	524.7		466.60	535.0		
May-04	424.1		272.50	436.0		
Jun-04	419.0		83.70	438.7		
Jul-04	388.1		74.20	398.4		
Aug-04	435.2		101.70	451.6		
Sep-04	402.2		367.50	389.4		
Oct-04	383.3		540.50	383.2		
Nov-04	489.4		719.80	512.0		
Dec-04	460.8	5,614.7	899.50	479.5	5,703.5	
Jan-05	674.3		1165.80	647.6		
Feb-05	513.3		795.20	519.4		
Mar-05	456.4		613.70	502.0		
Apr-05	466.4		453.30	480.1		
May-05	438.6		256.60	454.6		
Jun-05	416.8		154.40	418.4		
Jul-05	341.3		132.60	336.6		
Aug-05	420.9		150.80	424.7		
Sep-05	415.1		299.30	419.8		
Oct-05	420.5		534.60	421.9		
Nov-05	488.1		762.60	499.8		
Dec-05	513.1	5,564.8	794.40	558.6	5,683.6	
Jan-06	690.8		1096.20	681.9		
Feb-06	583.4		821.30	582.8		
Mar-06	586.7		906.30	557.7		
Apr-06	511.2		519.10	508.1		
May-06	521.1		346.90	514.0		
Jun-06	403.0		173.10	399.8		
Jul-06	408.8		118.40	407.8		
Aug-06	449.7		201.60	440.6		
Sep-06	444.9		295.70	450.5		
Oct-06	451.1		520.50	456.1		
Nov-06	590.7		1162.20	500.3		
Dec-06	646.4	6,287.8	824.30	684.3	6,183.8	

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Destruction Bay

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	836.4		912.00	874.6		
Feb-07	608.5		998.80	562.5		
Mar-07	654.6		954.20	613.3		
Apr-07	618.4		486.40	623.6		
May-07	584.7		322.10	583.9		
Jun-07	468.1		140.50	473.2		
Jul-07	512.1		102.30	515.2		
Aug-07	265.0		154.20	268.0		
Sep-07	427.8		308.40	430.2		
Oct-07	465.1		543.70	464.2		
Nov-07	559.5		724.60	580.8		
Dec-07	556.7	6,556.8	1069.50	531.9	6,521.5	
Jan-08	727.5		1113.80	714.1		
Feb-08	561.6		954.60	526.9		
Mar-08	613.8		734.70	628.6		
Apr-08	582.6		517.30	579.9		
May-08	523.9		307.90	526.7		
Jun-08	516.2		225.60	499.6		
Jul-08	411.5		173.40	396.5		
Aug-08	437.2		187.70	431.6		
Sep-08	417.3		318.70	417.0		
Oct-08	387.3		563.00	381.5		
Nov-08	557.0		782.50	563.6		
Dec-08	551.8	6,287.6	1186.20	497.2	6,163.2	
Jan-09	747.9		1137.90	728.3		
Feb-09	630.8		955.40	595.9		
Mar-09	592.2		868.50	572.8		
Apr-09	615.9		515.20	613.8		
May-09	470.8		331.20	467.7		
Jun-09	430.3		144.10	434.5		
Jul-09	446.5		62.50	459.8		
Aug-09	374.4		158.30	376.3		
Sep-09	452.9		306.10	455.8		
Oct-09	444.0		541.80	443.6		
Nov-09	562.1		781.50	568.9		
Dec-09	566.5	6,334.2	955.20	570.9	6,288.3	
Jan-10	832.1		991.10	850.1		
Feb-10	600.7		679.20	636.4		
Mar-10	516.7		656.00	551.6		
Apr-10	616.3		461.20	628.0		
May-10	516.8		292.00	523.7		
Jun-10	422.3		171.90	419.4		
Jul-10	439.6		117.30	438.9		
Aug-10	302.7		146.20	307.7		
Sep-10	450.8		332.40	447.1		
Oct-10	494.0		520.40	499.0		
Nov-10	589.1		717.60	612.3		
Dec-10	591.4	6,372.7	1162.50	542.9	6,457.1	
Jan-11	748.4		1010.20	761.4		
Feb-11	732.1		905.60	709.9		
Mar-11	655.9		901.70	628.0		
Apr-11	625.0		511.20	623.9		
May-11	486.4		296.40	492.2		
Jun-11	448.7		161.00	448.6		
Jul-11	403.8		127.80	400.4		
Aug-11	399.7		217.90	386.4		
Sep-11	475.3		328.50	472.5		
Nov-11	506.9		513.30	513.8		
Nov-11	523.4		931.70	491.9		
Dec-11	729.1	6,734.7	775.10	779.5	6,708.7	
Jan-12	831.4		1118.10	816.9		
Feb-12	684.6		691.70	717.1		
Mar-12	693.2		756.20	702.5		
Apr-12	505.5		450.60	520.0		
May-12	454.9		350.80	446.8		
Jun-12	550.7		195.10	541.9		
Jul-12	436.0		140.10	429.4		
Aug-12	459.1		157.90	461.1		
Sep-12	445.7		271.00	457.6		
Oct-12	486.2		639.30	460.8		
Nov-12	574.9		969.60	533.7		
Dec-12	799.3	6,921.5	1196.80	742.0	6,829.8	

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Destruction Bay

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	869.1		952.00	897.0		
Feb-13	724.1		665.40	763.3		
Mar-13	638.8		851.10	623.9		
Apr-13	674.9		639.90	641.0		
May-13	511.9		294.00	518.3		
Jun-13	496.3		112.40	508.6		
Jul-13	505.1		92.50	510.7		
Aug-13	460.4		98.90	477.5		
Sep-13	482.9		264.30	496.5		
Oct-13	527.6		501.40	537.5		
Nov-13	563.5		865.60	548.8		
Dec-13	769.4	7,224.0	1144.70	725.4	7,248.6	
Jan-14	937.9		745.80	1,018.5		
Feb-14	728.2		992.40	683.8		
Mar-14	794.9		855.10	778.9		
Apr-14	608.3		499.80	610.1		
May-14	551.3		269.50	563.9		
Jun-14	463.0		200.50	452.8		
Jul-14	506.2		98.00	510.4		
Aug-14	326.7		144.00	332.3		
Sep-14	513.2		307.10	515.9		
Oct-14	367.5		515.60	373.8		
Nov-14	570.6		772.80	579.7		
Dec-14	627.2	6,995.0	854.40	657.4	7,077.5	
Jan-15	909.9		927.00	944.2		
Feb-15	718.0		851.40	709.7		
Mar-15	592.8		671.30	623.8		
Apr-15	588.6		453.50	602.3		
May-15	479.4		192.90	511.7		
Jun-15	415.9		127.20	424.4		
Jul-15	475.7		115.70	475.4		
Aug-15	374.6		183.20	370.2		
Sep-15	539.3		332.70	535.4		
Oct-15	477.6		469.80	495.5		
Nov-15	642.8		759.20	655.3		
Dec-15	768.2	6,982.8	947.90	774.5	7,122.4	
Jan-16	762.3		827.6	822.0		
Feb-16	604.9		688.0	638.3		
Mar-16	663.4		611.6	709.6		
Apr-16	597.0					
May-16	507.2					
Jun-16	420.7					
Jul-16	471.2					
Aug-16	366.9					
Sep-16	530.8					
Oct-16	491.2					
Nov-16	649.6					
Dec-16	767.7	6,832.9			6,972.2	
Jan-17	814.8					
Feb-17	632.7					
Mar-17	703.4					
Apr-17	591.8					
May-17	502.8					
Jun-17	417.0					
Jul-17	467.1					
Aug-17	363.7					
Sep-17	526.1					
Oct-17	486.9					
Nov-17	643.9					
Dec-17	761.0	6,911.3			6,911.3	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (7,122.4 / 7,248.6) ^ {1/2} - 1 = \quad \quad \quad \mathbf{-0.9\%}$$

Note: January, February and March 2016 have been updated to include actuals.

**ATCO Electric Yukon
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**Section 2
Attachment 10**

Beaver Creek

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	945.1		1020.10	962.0		SUMMARY OUTPUT
Feb-95	835.5		840.10	826.8		Regression Statistics
Mar-95	812.7		880.00	776.8		Multiple R 0.826293451
Apr-95	728.9		439.90	756.5		R Square 0.682760868
May-95	758.9		250.70	787.0		Adjusted R Square 0.680978625
Jun-95	692.4		139.00	701.4		Standard Error 92.8116712
Jul-95	695.2		96.60	702.6		Observations 180
Aug-95	712.1		198.30	698.8		
Sep-95	691.6		226.50	729.1		ANOVA
Oct-95	702.4		524.90	708.7		
Nov-95	1225.7		894.40	1,190.3		
Dec-95	937.0	9,737.7	1048.60	905.7	9,745.6	
Jan-96	1180.8		1530.10	988.2		
Feb-96	769.5		835.80	762.6		
Mar-96	856.8		805.80	851.4		
Apr-96	677.7		526.00	669.9		
May-96	782.1		357.30	766.3		
Jun-96	520.2		193.60	506.7		
Jul-96	577.1		124.90	572.8		
Aug-96	862.2		227.30	837.0		
Sep-96	593.7		362.60	575.3		
Oct-96	470.6		679.90	413.2		
Nov-96	1165.5		975.00	1,097.0		
Dec-96	923.7	9,379.9	1155.80	848.3	8,888.7	
Jan-97	1124.8		1185.70	1,073.7		
Feb-97	781.7		656.50	848.4		
Mar-97	727.7		855.40	701.9		
Apr-97	649.3		484.00	658.8		
May-97	576.5		331.10	571.5		
Jun-97	535.3		148.90	540.1		
Jul-97	531.2		92.80	540.1		
Aug-97	614.8		130.00	629.5		
Sep-97	541.2		282.10	555.8		
Oct-97	751.6		641.00	710.2		
Nov-97	702.3		685.80	752.6		
Dec-97	1018.6	8,555.0	762.00	1,105.1	8,687.7	
Jan-98	1144.8		1165.70	1,101.9		
Feb-98	879.3		719.10	920.3		
Mar-98	511.2		756.60	526.0		
Apr-98	673.3		458.60	693.1		
May-98	539.4		270.60	559.3		
Jun-98	498.1		119.50	515.1		
Jul-98	569.9		111.60	571.1		
Aug-98	552.9		189.20	543.4		
Sep-98	489.3		327.80	485.1		
Oct-98	681.0		557.70	673.8		
Nov-98	795.5		792.30	802.0		
Dec-98	789.6	8,124.2	1051.80	757.0	8,148.0	
Jan-99	927.2		1183.10	877.1		
Feb-99	743.0		976.40	678.3		
Mar-99	735.9		734.00	760.0		
Apr-99	667.8		508.80	667.1		
May-99	531.0		391.90	501.1		
Jun-99	552.4		153.90	555.2		
Jul-99	546.3		108.60	548.7		
Aug-99	438.3		145.70	446.6		
Sep-99	584.7		311.20	587.3		
Oct-99	603.8		499.80	620.4		
Nov-99	711.3		792.50	717.7		
Dec-99	919.7	7,961.3	844.00	972.5	7,931.9	
Jan-00	816.6		1082.90	807.7		
Feb-00	788.8		735.20	823.2		
Mar-00	676.6		659.20	731.4		
Apr-00	597.0		515.60	593.5		
May-00	618.7		382.00	592.9		
Jun-00	523.5		172.50	518.6		
Jul-00	554.3		142.10	542.9		
Aug-00	503.8		219.70	481.7		
Sep-00	598.1		354.20	583.1		
Oct-00	638.8		537.20	640.1		
Nov-00	671.2		694.20	718.0		
Dec-00	734.2	7,721.5	973.00	734.0	7,766.9	

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Beaver Creek

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-01	856.0		724.60	994.4		
Feb-01	692.2		864.10	673.6		
Mar-01	636.6		765.30	647.9		
Apr-01	617.5		505.30	618.2		
May-01	593.6		390.40	564.3		
Jun-01	551.7		167.30	549.0		
Jul-01	511.1		139.60	500.8		
Aug-01	598.0		139.60	608.8		
Sep-01	651.8		309.00	655.3		
Oct-01	682.9		573.40	669.2		
Nov-01	743.4		818.00	739.4		
Dec-01	763.2	7,897.9	1094.60	713.0	7,933.7	
Jan-02	921.8		938.10	972.4		
Feb-02	793.0		824.60	790.6		
Mar-02	744.4		921.00	691.6		
Apr-02	839.6		653.30	779.5		
May-02	576.6		361.60	559.1		
Jun-02	514.9		175.60	508.8		
Jul-02	528.8		130.90	522.0		
Aug-02	521.2		182.80	514.2		
Sep-02	536.8		314.40	538.1		
Oct-02	655.2		444.30	694.6		
Nov-02	667.7		582.60	760.4		
Dec-02	652.8	7,952.6	845.10	705.1	8,036.4	
Jan-03	1051.7		992.60	1,079.9		
Feb-03	754.0		756.60	779.5		
Mar-03	668.5		832.20	652.2		
Apr-03	711.8		514.30	708.8		
May-03	594.3		363.70	575.9		
Jun-03	537.0		192.80	523.8		
Jul-03	552.8		84.20	565.2		
Aug-03	559.4		180.60	553.4		
Sep-03	590.5		359.20	573.4		
Oct-03	579.5		466.70	609.7		
Nov-03	852.0		874.60	824.7		
Dec-03	838.3	8,289.8	911.60	863.3	8,310.0	
Jan-04	1057.5		1254.00	978.3		
Feb-04	855.0		697.20	905.0		
Mar-04	803.2		753.50	819.2		
Apr-04	868.1		466.60	884.7		
May-04	572.6		272.50	591.8		
Jun-04	535.5		83.70	567.1		
Jul-04	601.5		74.20	618.0		
Aug-04	517.9		101.70	544.3		
Sep-04	622.1		367.50	601.6		
Oct-04	610.3		540.50	610.2		
Nov-04	715.2		719.80	751.5		
Dec-04	1006.2	8,765.0	899.50	1,036.1	8,907.8	
Jan-05	1000.5		1165.80	957.5		
Feb-05	928.9		795.20	938.6		
Mar-05	741.7		613.70	815.2		
Apr-05	691.1		453.30	713.2		
May-05	572.0		256.60	597.6		
Jun-05	603.9		154.40	606.5		
Jul-05	527.8		132.60	520.4		
Aug-05	525.0		150.80	531.2		
Sep-05	591.3		299.30	598.9		
Oct-05	636.6		534.60	638.9		
Nov-05	714.1		762.60	732.9		
Dec-05	800.3	8,333.2	794.40	873.4	8,524.2	
Jan-06	1004.7		1096.20	990.3		
Feb-06	976.2		821.30	975.2		
Mar-06	988.2		906.30	941.5		
Apr-06	708.0		519.10	703.0		
May-06	586.0		346.90	574.5		
Jun-06	602.9		173.10	597.8		
Jul-06	487.8		118.40	486.2		
Aug-06	532.0		201.60	517.3		
Sep-06	631.2		295.70	640.2		
Oct-06	615.5		520.50	623.6		
Nov-06	692.1		1162.20	546.7		
Dec-06	925.5	8,750.2	824.30	986.4	8,582.8	

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Beaver Creek

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1060.7		912.00	1,122.0		
Feb-07	841.0		998.80	767.1		
Mar-07	1041.7		954.20	975.3		
Apr-07	827.1		486.40	835.6		
May-07	614.6		322.10	613.4		
Jun-07	687.4		140.50	695.7		
Jul-07	563.4		102.30	568.4		
Aug-07	582.0		154.20	586.8		
Sep-07	540.5		308.40	544.3		
Oct-07	682.5		543.70	681.0		
Nov-07	754.7		724.60	789.1		
Dec-07	791.7	8,987.5	1069.50	751.8	8,930.6	
Jan-08	946.6		1113.80	925.0		
Feb-08	996.8		954.60	941.0		
Mar-08	717.7		734.70	741.5		
Apr-08	730.9		517.30	726.7		
May-08	635.7		307.90	640.3		
Jun-08	607.3		225.60	580.6		
Jul-08	563.6		173.40	539.4		
Aug-08	644.3		187.70	635.4		
Sep-08	532.3		318.70	531.8		
Oct-08	617.1		563.00	607.8		
Nov-08	772.1		782.50	782.7		
Dec-08	1011.9	8,776.4	1186.20	924.1	8,576.3	
Jan-09	945.6		1137.90	914.1		
Feb-09	924.9		955.40	868.8		
Mar-09	833.9		868.50	802.7		
Apr-09	741.1		515.20	737.7		
May-09	584.1		331.20	579.2		
Jun-09	499.0		144.10	505.8		
Jul-09	609.5		62.50	630.9		
Aug-09	588.9		158.30	592.0		
Sep-09	590.6		306.10	595.3		
Oct-09	691.7		541.80	691.0		
Nov-09	787.3		781.50	798.3		
Dec-09	846.3	8,643.0	955.20	853.4	8,569.3	
Jan-10	1096.4		991.10	1,125.3		
Feb-10	876.4		679.20	933.8		
Mar-10	815.8		656.00	871.9		
Apr-10	743.0		461.20	761.8		
May-10	694.1		292.00	705.2		
Jun-10	564.3		171.90	559.7		
Jul-10	611.6		117.30	610.5		
Aug-10	629.8		146.20	637.9		
Sep-10	568.3		332.40	562.3		
Oct-10	662.1		520.40	670.2		
Nov-10	677.6		717.60	714.8		
Dec-10	786.7	8,726.2	1162.50	708.6	8,862.0	
Jan-11	1133.2		1010.20	1,154.2		
Feb-11	867.0		905.60	831.3		
Mar-11	865.7		901.70	820.9		
Apr-11	724.3		511.20	722.6		
May-11	612.0		296.40	621.3		
Jun-11	533.4		161.00	533.3		
Jul-11	603.7		127.80	598.2		
Aug-11	606.0		217.90	584.6		
Sep-11	594.5		328.50	590.0		
Nov-11	674.0		513.30	685.1		
Nov-11	886.1		931.70	835.3		
Dec-11	1049.4	9,149.2	775.10	1,130.5	9,107.2	
Jan-12	1099.7		1118.10	1,076.4		
Feb-12	902.1		691.70	954.4		
Mar-12	862.1		756.20	877.0		
Apr-12	668.2		450.60	691.4		
May-12	644.9		350.80	631.9		
Jun-12	658.5		195.10	644.3		
Jul-12	560.5		140.10	550.0		
Aug-12	608.1		157.90	611.4		
Sep-12	595.8		271.00	615.0		
Oct-12	716.2		639.30	675.5		
Nov-12	872.7		969.60	806.4		
Dec-12	1057.3	9,246.2	1196.80	965.2	9,098.7	

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Beaver Creek

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,137.3		952.00	1,182.2		
Feb-13	1,006.1		665.40	1,069.1		
Mar-13	843.4		851.10	819.3		
Apr-13	777.2		639.90	722.6		
May-13	656.2		294.00	666.5		
Jun-13	713.0		112.40	732.9		
Jul-13	524.3		92.50	533.3		
Aug-13	601.9		98.90	629.4		
Sep-13	614.7		264.30	636.6		
Oct-13	671.7		501.40	687.7		
Nov-13	892.8		865.60	869.2		
Dec-13	791.9	9,230.4	1144.70	721.1	9,269.9	
Jan-14	1,075.7		745.80	1,205.3		
Feb-14	1,006.6		992.40	935.3		
Mar-14	662.4		855.10	636.7		
Apr-14	538.5		499.80	541.4		
May-14	727.1		269.50	747.5		
Jun-14	566.8		200.50	550.5		
Jul-14	530.0		98.00	536.8		
Aug-14	571.6		144.00	580.6		
Sep-14	588.1		307.10	592.4		
Oct-14	612.3		515.60	622.4		
Nov-14	816.4		772.80	830.9		
Dec-14	839.3	8,534.8	854.40	887.8	8,667.6	
Jan-15	1,167.1		927.00	1,222.3		
Feb-15	773.6		851.40	760.2		
Mar-15	716.1		671.30	765.9		
Apr-15	743.1		453.50	765.1		
May-15	597.0		192.90	648.8		
Jun-15	554.5		127.20	568.2		
Jul-15	533.8		115.70	533.3		
Aug-15	545.1		183.20	538.0		
Sep-15	668.1		332.70	661.9		
Oct-15	519.5		469.80	548.4		
Nov-15	833.3		759.20	853.5		
Dec-15	761.8	8,413.1	947.90	771.9	8,637.6	
Jan-16	1,076.4		827.6	1,172.5		
Feb-16	772.0		688.0	825.7		
Mar-16	820.0		611.6	894.3		
Apr-16	738.6					
May-16	626.3					
Jun-16	548.5					
Jul-16	514.8					
Aug-16	519.3					
Sep-16	638.9					
Oct-16	529.4					
Nov-16	823.8					
Dec-16	745.1	8,353.1			8,577.2	
Jan-17	1,131.8					
Feb-17	797.1					
Mar-17	863.3					
Apr-17	712.9					
May-17	604.6					
Jun-17	529.5					
Jul-17	496.9					
Aug-17	501.3					
Sep-17	616.7					
Oct-17	511.0					
Nov-17	795.2					
Dec-17	719.3	8,279.5			8,279.5	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (8,637.6 / 9,269.9) ^ (1/2) - 1 = **-3.5%**

Note: January, February and March 2016 have been updated to include actuals.

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Tagish

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	642.8		1020.10	653.7		SUMMARY OUTPUT
Feb-95	456.8		840.10	451.1		Regression Statistics
Mar-95	611.8		880.00	588.7		Multiple R 0.794862569
Apr-95	331.3		439.90	349.0		R Square 0.631806504
May-95	289.7		250.70	307.8		Adjusted R Square 0.629738001
Jun-95	307.1		139.00	312.8		Standard Error 66.85398858
Jul-95	276.9		96.60	281.6		Observations 180
Aug-95	254.8		198.30	246.2		
Sep-95	320.8		226.50	344.8		ANOVA
Oct-95	327.2		524.90	331.3		
Nov-95	426.2		894.40	403.5		
Dec-95	562.4	4,807.9	1048.60	542.3	4,813.0	
Jan-96	548.7		1530.10	424.8		
Feb-96	656.4		835.80	651.9		
Mar-96	393.5		805.80	390.0		
Apr-96	344.6		526.00	339.6		
May-96	327.2		357.30	317.1		
Jun-96	266.1		193.60	257.4		
Jul-96	293.4		124.90	290.7		
Aug-96	311.8		227.30	295.5		
Sep-96	310.2		362.60	298.3		
Oct-96	365.3		679.90	328.4		
Nov-96	404.2		975.00	360.1		
Dec-96	524.7	4,746.2	1155.80	476.3	4,430.2	
Jan-97	602.9		1185.70	570.0		
Feb-97	382.2		656.50	425.1		
Mar-97	368.5		855.40	351.9		
Apr-97	335.2		484.00	341.3		
May-97	306.2		331.10	303.0		
Jun-97	261.4		148.90	264.5		
Jul-97	271.6		92.80	277.3		
Aug-97	291.7		130.00	301.1		
Sep-97	274.6		282.10	284.0		
Oct-97	350.4		641.00	323.8		
Nov-97	324.1		685.80	356.5		
Dec-97	358.4	4,127.3	762.00	414.0	4,212.6	
Jan-98	568.7		1165.70	541.1		
Feb-98	390.6		719.10	417.0		
Mar-98	359.5		756.60	369.0		
Apr-98	335.1		458.60	347.9		
May-98	295.2		270.60	308.0		
Jun-98	269.5		119.50	280.4		
Jul-98	307.0		111.60	307.8		
Aug-98	284.3		189.20	278.1		
Sep-98	300.5		327.80	297.8		
Oct-98	340.7		557.70	336.1		
Nov-98	348.6		792.30	352.8		
Dec-98	377.6	4,177.4	1051.80	356.6	4,192.6	
Jan-99	537.1		1183.10	504.9		
Feb-99	423.8		976.40	382.2		
Mar-99	374.6		734.00	390.1		
Apr-99	372.7		508.80	372.2		
May-99	292.2		391.90	272.9		
Jun-99	271.0		153.90	272.8		
Jul-99	306.2		108.60	307.7		
Aug-99	281.0		145.70	286.3		
Sep-99	295.0		311.20	296.7		
Oct-99	287.7		499.80	298.4		
Nov-99	312.6		792.50	316.8		
Dec-99	373.6	4,127.5	844.00	407.5	4,108.5	
Jan-00	453.6		1082.90	447.9		
Feb-00	337.3		735.20	359.4		
Mar-00	325.0		659.20	360.2		
Apr-00	308.3		515.60	306.0		
May-00	298.6		382.00	282.0		
Jun-00	263.0		172.50	259.8		
Jul-00	275.8		142.10	268.5		
Aug-00	299.8		219.70	285.6		
Sep-00	274.6		354.20	264.9		
Oct-00	269.6		537.20	270.4		
Nov-00	291.3		694.20	321.4		
Dec-00	367.9	3,764.7	973.00	367.8	3,793.9	

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Tagish

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	343.7		724.60	432.7		
Feb-01	359.3		864.10	347.4		
Mar-01	303.1		765.30	310.3		
Apr-01	284.3		505.30	284.8		
May-01	273.1		390.40	254.3		
Jun-01	241.5		167.30	239.7		
Jul-01	256.8		139.60	250.2		
Aug-01	278.6		139.60	285.5		
Sep-01	261.9		309.00	264.1		
Oct-01	274.6		573.40	265.8		
Nov-01	324.2		818.00	321.6		
Dec-01	439.5	3,640.5	1094.60	407.2	3,663.5	
Jan-02	419.7		938.10	452.2		
Feb-02	352.3		824.60	350.7		
Mar-02	321.0		921.00	287.1		
Apr-02	314.9		653.30	276.2		
May-02	283.3		361.60	272.1		
Jun-02	248.4		175.60	244.4		
Jul-02	272.1		130.90	267.8		
Aug-02	290.7		182.80	286.3		
Sep-02	253.2		314.40	254.1		
Oct-02	299.4		444.30	324.7		
Nov-02	317.1		582.60	376.8		
Dec-02	368.7	3,740.8	845.10	402.4	3,794.7	
Jan-03	438.0		992.60	456.2		
Feb-03	352.7		756.60	369.1		
Mar-03	336.3		832.20	325.8		
Apr-03	313.8		514.30	311.9		
May-03	281.5		363.70	269.8		
Jun-03	255.8		192.80	247.3		
Jul-03	287.8		84.20	295.8		
Aug-03	270.5		180.60	266.6		
Sep-03	277.4		359.20	266.4		
Oct-03	243.6		466.70	263.0		
Nov-03	263.4		874.60	245.9		
Dec-03	377.0	3,697.8	911.60	393.0	3,710.8	
Jan-04	426.3		1254.00	375.4		
Feb-04	377.8		697.20	409.9		
Mar-04	340.3		753.50	350.6		
Apr-04	360.0		466.60	370.7		
May-04	281.2		272.50	293.5		
Jun-04	250.3		83.70	270.6		
Jul-04	291.1		74.20	301.7		
Aug-04	256.9		101.70	273.8		
Sep-04	317.2		367.50	304.0		
Oct-04	304.8		540.50	304.7		
Nov-04	336.1		719.80	359.5		
Dec-04	375.4	3,917.5	899.50	394.7	4,009.3	
Jan-05	532.5		1165.80	504.9		
Feb-05	428.1		795.20	434.4		
Mar-05	324.6		613.70	371.8		
Apr-05	316.3		453.30	330.5		
May-05	271.6		256.60	288.1		
Jun-05	252.4		154.40	254.1		
Jul-05	286.2		132.60	281.4		
Aug-05	300.5		150.80	304.5		
Sep-05	276.1		299.30	280.9		
Oct-05	312.5		534.60	313.9		
Nov-05	346.2		762.60	358.3		
Dec-05	412.0	4,059.0	794.40	459.1	4,181.9	
Jan-06	549.9		1096.20	540.7		
Feb-06	435.9		821.30	435.3		
Mar-06	453.9		906.30	423.8		
Apr-06	380.8		519.10	377.6		
May-06	327.1		346.90	319.8		
Jun-06	262.5		173.10	259.2		
Jul-06	320.2		118.40	319.2		
Aug-06	276.5		201.60	267.1		
Sep-06	308.1		295.70	313.9		
Oct-06	325.5		520.50	330.7		
Nov-06	424.6		1162.20	331.1		
Dec-06	526.0	4,591.1	824.30	565.2	4,483.5	

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Tagish

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Annual Normalized UPC (kWh)	Regression Output:
	UPC (kWh)	UPC (kWh)			
Jan-07	596.1		912.00	635.5	
Feb-07	549.4		998.80	501.9	
Mar-07	455.3		954.20	412.6	
Apr-07	357.5		486.40	363.0	
May-07	332.1		322.10	331.3	
Jun-07	297.5		140.50	302.8	
Jul-07	285.5		102.30	288.7	
Aug-07	297.6		154.20	300.7	
Sep-07	297.4		308.40	299.8	
Oct-07	340.9		543.70	340.0	
Nov-07	471.0		724.60	493.1	
Dec-07	509.6	4,789.8	1069.50	483.9	4,753.2
Jan-08	529.4		1113.80	515.5	
Feb-08	605.0		954.60	569.2	
Mar-08	413.0		734.70	428.3	
Apr-08	340.6		517.30	337.9	
May-08	289.6		307.90	292.6	
Jun-08	281.5		225.60	264.3	
Jul-08	269.3		173.40	253.8	
Aug-08	319.5		187.70	313.8	
Sep-08	293.1		318.70	292.9	
Oct-08	317.1		563.00	311.1	
Nov-08	489.6		782.50	496.4	
Dec-08	511.7	4,659.6	1186.20	455.2	4,530.8
Jan-09	688.8		1137.90	668.6	
Feb-09	556.8		955.40	520.7	
Mar-09	490.7		868.50	470.6	
Apr-09	425.9		515.20	423.8	
May-09	291.6		331.20	288.4	
Jun-09	270.6		144.10	275.0	
Jul-09	322.5		62.50	336.3	
Aug-09	280.9		158.30	282.9	
Sep-09	304.0		306.10	307.0	
Oct-09	385.4		541.80	385.0	
Nov-09	451.4		781.50	458.5	
Dec-09	512.9	4,981.5	955.20	517.5	4,934.1
Jan-10	631.3		991.10	649.8	
Feb-10	511.8		679.20	548.7	
Mar-10	425.3		656.00	461.4	
Apr-10	423.8		461.20	435.9	
May-10	351.0		292.00	358.2	
Jun-10	281.4		171.90	278.5	
Jul-10	316.5		117.30	315.8	
Aug-10	311.3		146.20	316.5	
Sep-10	336.1		332.40	332.2	
Oct-10	414.6		520.40	419.8	
Nov-10	417.0		717.60	440.9	
Dec-10	536.8	4,956.9	1162.50	486.5	5,044.2
Jan-11	730.8		1010.20	744.3	
Feb-11	521.0		905.60	498.1	
Mar-11	548.0		901.70	519.2	
Apr-11	392.6		511.20	391.5	
May-11	364.9		296.40	370.9	
Jun-11	286.4		161.00	286.3	
Jul-11	324.1		127.80	320.6	
Aug-11	317.6		217.90	303.8	
Sep-11	343.4		328.50	340.6	
Nov-11	361.8		513.30	368.9	
Nov-11	517.5		931.70	484.8	
Dec-11	494.3	5,202.4	775.10	546.4	5,175.4
Jan-12	700.8		1118.10	685.8	
Feb-12	507.4		691.70	541.0	
Mar-12	504.9		756.20	514.5	
Apr-12	346.0		450.60	360.9	
May-12	352.1		350.80	343.7	
Jun-12	348.5		195.10	339.4	
Jul-12	315.0		140.10	308.2	
Aug-12	344.4		157.90	346.5	
Sep-12	333.8		271.00	346.1	
Oct-12	414.2		639.30	388.0	
Nov-12	513.1		969.60	470.4	
Dec-12	637.6	5,317.7	1196.80	578.3	5,222.8

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Tagish

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	716.2		952.00	745.1		
Feb-13	487.4		665.40	528.0		
Mar-13	502.0		851.10	486.6		
Apr-13	392.1		639.90	357.0		
May-13	350.2		294.00	356.9		
Jun-13	335.0		112.40	347.8		
Jul-13	278.4		92.50	284.2		
Aug-13	357.9		98.90	375.6		
Sep-13	259.0		264.30	273.1		
Oct-13	344.8		501.40	355.0		
Nov-13	497.0		865.60	481.8		
Dec-13	592.5	5,112.5	1144.70	547.0	5,137.9	
Jan-14	606.7		745.80	690.1		
Feb-14	594.2		992.40	548.4		
Mar-14	548.7		855.10	532.1		
Apr-14	375.4		499.80	377.3		
May-14	310.0		269.50	323.1		
Jun-14	307.9		200.50	297.3		
Jul-14	295.2		98.00	299.5		
Aug-14	314.4		144.00	320.2		
Sep-14	310.3		307.10	313.1		
Oct-14	340.5		515.60	347.0		
Nov-14	421.8		772.80	431.2		
Dec-14	560.6	4,985.6	854.40	591.8	5,071.1	
Jan-15	579.2		927.00	614.7		
Feb-15	536.8		851.40	528.2		
Mar-15	381.3		671.30	413.4		
Apr-15	384.5		453.50	398.6		
May-15	302.7		192.90	336.1		
Jun-15	278.4		127.20	287.3		
Jul-15	322.4		115.70	322.1		
Aug-15	287.6		183.20	283.0		
Sep-15	328.7		332.70	324.7		
Oct-15	403.2		469.80	421.8		
Nov-15	460.1		759.20	473.1		
Dec-15	524.3	4,789.3	947.90	530.8	4,933.7	
Jan-16	694.1		827.6	755.8		
Feb-16	463.7		688.0	498.3		
Mar-16	415.8		611.6	463.6		
Apr-16	390.6					
May-16	329.3					
Jun-16	281.5					
Jul-16	315.6					
Aug-16	277.4					
Sep-16	318.2					
Oct-16	413.3					
Nov-16	463.6					
Dec-16	520.1	4,883.3			5,027.4	
Jan-17	740.7					
Feb-17	488.3					
Mar-17	454.3					
Apr-17	382.8					
May-17	322.7					
Jun-17	275.8					
Jul-17	309.3					
Aug-17	271.8					
Sep-17	311.8					
Oct-17	405.0					
Nov-17	454.3					
Dec-17	509.7	4,926.5			4,926.5	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (4,933.7 / 5,137.9) ^ {1/2} - 1 = \mathbf{-2.0\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Marsh Lake

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	839.3		1020.10	860.4		SUMMARY OUTPUT
Feb-95	733.8		840.10	722.8		Regression Statistics
Mar-95	832.5		880.00	787.6		Multiple R 0.862631497
Apr-95	574.7		439.90	609.1		R Square 0.7441331
May-95	508.3		250.70	543.4		Adjusted R Square 0.742695645
Jun-95	408.6		139.00	419.7		Standard Error 99.7703997
Jul-95	436.4		96.60	445.6		Observations 180
Aug-95	456.2		198.30	439.5		
Sep-95	477.5		226.50	524.3		ANOVA
Oct-95	538.3		524.90	546.2		
Nov-95	743.0		894.40	698.8		
Dec-95	989.3	7,537.8	1048.60	950.2	7,547.7	
Jan-96	815.3		1530.10	574.6		
Feb-96	1224.2		835.80	1,215.4		
Mar-96	693.6		805.80	686.8		
Apr-96	602.1		526.00	592.3		
May-96	510.5		357.30	490.8		
Jun-96	417.8		193.60	400.9		
Jul-96	462.3		124.90	457.0		
Aug-96	454.2		227.30	422.7		
Sep-96	497.3		362.60	474.2		
Oct-96	666.1		679.90	594.4		
Nov-96	837.2		975.00	751.6		
Dec-96	992.4	8,172.8	1155.80	898.2	7,558.9	
Jan-97	1187.5		1185.70	1,123.6		
Feb-97	697.2		656.50	780.6		
Mar-97	668.5		855.40	636.3		
Apr-97	662.3		484.00	674.1		
May-97	499.9		331.10	493.7		
Jun-97	421.6		148.90	427.6		
Jul-97	494.0		92.80	505.1		
Aug-97	403.8		130.00	422.2		
Sep-97	474.6		282.10	492.8		
Oct-97	652.8		641.00	601.1		
Nov-97	638.7		685.80	701.6		
Dec-97	791.1	7,592.0	762.00	899.2	7,757.8	
Jan-98	922.6		1165.70	869.0		
Feb-98	719.5		719.10	770.7		
Mar-98	633.4		756.60	651.9		
Apr-98	589.4		458.60	614.3		
May-98	493.5		270.60	518.4		
Jun-98	439.1		119.50	460.2		
Jul-98	487.4		111.60	488.8		
Aug-98	466.9		189.20	454.9		
Sep-98	554.5		327.80	549.2		
Oct-98	560.7		557.70	551.7		
Nov-98	655.5		792.30	663.7		
Dec-98	886.5	7,409.0	1051.80	845.8	7,438.7	
Jan-99	907.0		1183.10	844.5		
Feb-99	812.2		976.40	731.3		
Mar-99	660.7		734.00	690.8		
Apr-99	615.4		508.80	614.5		
May-99	514.0		391.90	476.6		
Jun-99	473.1		153.90	476.5		
Jul-99	461.3		108.60	464.3		
Aug-99	428.8		145.70	439.1		
Sep-99	511.2		311.20	514.5		
Oct-99	517.5		499.80	538.2		
Nov-99	589.2		792.50	597.3		
Dec-99	824.0	7,314.4	844.00	890.0	7,277.7	
Jan-00	828.7		1082.90	817.6		
Feb-00	665.5		735.20	708.5		
Mar-00	578.5		659.20	647.0		
Apr-00	569.3		515.60	564.8		
May-00	525.1		382.00	492.8		
Jun-00	429.6		172.50	423.5		
Jul-00	451.8		142.10	437.6		
Aug-00	493.7		219.70	466.1		
Sep-00	501.7		354.20	482.9		
Oct-00	580.6		537.20	582.2		
Nov-00	591.0		694.20	649.6		
Dec-00	788.3	7,003.8	973.00	788.0	7,060.6	

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Marsh Lake

Residential Monthly	Annual Actual / Forecast (Whitehorse)		Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	UPC (kWh)	UPC (kWh)	
Jan-01	714.6		724.60	887.4	
Feb-01	674.4		864.10	651.1	
Mar-01	609.1		765.30	623.2	
Apr-01	560.9		505.30	561.8	
May-01	554.5		390.40	517.9	
Jun-01	444.6		167.30	441.2	
Jul-01	480.7		139.60	467.8	
Aug-01	438.1		139.60	451.6	
Sep-01	452.6		309.00	457.0	
Oct-01	571.9		573.40	554.8	
Nov-01	642.5		818.00	637.5	
Dec-01	910.5	7,054.4	1094.60	847.8	7,099.1
Jan-02	805.9		938.10	869.1	
Feb-02	644.9		824.60	641.9	
Mar-02	627.6		921.00	561.6	
Apr-02	659.0		653.30	583.9	
May-02	505.7		361.60	483.9	
Jun-02	445.3		175.60	437.7	
Jul-02	445.9		130.90	437.4	
Aug-02	465.1		182.80	456.4	
Sep-02	463.3		314.40	465.0	
Oct-02	559.6		444.30	608.8	
Nov-02	576.0		582.60	691.9	
Dec-02	744.7	6,942.9	845.10	810.1	7,047.7
Jan-03	772.8		992.60	808.1	
Feb-03	611.4		756.60	643.3	
Mar-03	600.8		832.20	580.5	
Apr-03	602.1		514.30	598.3	
May-03	459.7		363.70	436.8	
Jun-03	450.1		192.80	433.6	
Jul-03	466.4		84.20	481.9	
Aug-03	456.0		180.60	448.4	
Sep-03	521.7		359.20	500.4	
Oct-03	492.3		466.70	530.0	
Nov-03	697.3		874.60	663.2	
Dec-03	822.9	6,953.4	911.60	854.1	6,978.7
Jan-04	807.2		1254.00	708.3	
Feb-04	657.4		697.20	719.9	
Mar-04	618.4		753.50	638.4	
Apr-04	623.6		466.60	644.3	
May-04	482.3		272.50	506.2	
Jun-04	494.3		83.70	533.9	
Jul-04	457.0		74.20	477.7	
Aug-04	460.8		101.70	493.7	
Sep-04	524.1		367.50	498.5	
Oct-04	543.8		540.50	543.6	
Nov-04	635.0		719.80	680.4	
Dec-04	834.5	7,138.5	899.50	872.0	7,316.9
Jan-05	869.0		1165.80	815.4	
Feb-05	755.4		795.20	767.5	
Mar-05	604.8		613.70	696.6	
Apr-05	524.1		453.30	551.6	
May-05	521.3		256.60	553.4	
Jun-05	451.8		154.40	455.0	
Jul-05	473.2		132.60	463.9	
Aug-05	476.9		150.80	484.6	
Sep-05	513.4		299.30	522.8	
Oct-05	533.6		534.60	536.5	
Nov-05	699.3		762.60	722.8	
Dec-05	774.4	7,197.1	794.40	865.8	7,435.8
Jan-06	848.6		1096.20	830.7	
Feb-06	796.0		821.30	794.8	
Mar-06	757.6		906.30	699.3	
Apr-06	581.7		519.10	575.4	
May-06	548.7		346.90	534.4	
Jun-06	461.7		173.10	455.4	
Jul-06	466.0		118.40	464.0	
Aug-06	508.0		201.60	489.7	
Sep-06	526.7		295.70	537.9	
Oct-06	582.3		520.50	592.4	
Nov-06	880.0		1162.20	698.3	
Dec-06	885.1	7,842.6	824.30	961.1	7,633.5

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Marsh Lake

Residential Monthly	Annual Actual / Forecast (Whitehorse)			Annual Normalized		Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	895.2		912.00	971.8		
Feb-07	874.5		998.80	782.1		
Mar-07	718.5		954.20	635.5		
Apr-07	588.7		486.40	599.3		
May-07	496.1		322.10	494.6		
Jun-07	474.1		140.50	484.5		
Jul-07	480.4		102.30	486.6		
Aug-07	512.9		154.20	518.9		
Sep-07	497.3		308.40	502.0		
Oct-07	644.3		543.70	642.5		
Nov-07	795.6		724.60	838.5		
Dec-07	899.9	7,877.5	1069.50	850.1	7,806.4	
Jan-08	975.1		1113.80	948.2		
Feb-08	955.7		954.60	886.0		
Mar-08	727.9		734.70	757.6		
Apr-08	658.4		517.30	653.1		
May-08	525.7		307.90	531.5		
Jun-08	487.4		225.60	454.1		
Jul-08	470.9		173.40	440.6		
Aug-08	556.1		187.70	544.9		
Sep-08	518.1		318.70	517.6		
Oct-08	593.7		563.00	582.0		
Nov-08	844.5		782.50	857.7		
Dec-08	1073.8	8,387.5	1186.20	964.1	8,137.4	
Jan-09	1064.6		1137.90	1,025.3		
Feb-09	918.5		955.40	848.4		
Mar-09	851.8		868.50	812.8		
Apr-09	765.6		515.20	761.3		
May-09	500.9		331.20	494.7		
Jun-09	493.9		144.10	502.5		
Jul-09	502.6		62.50	529.3		
Aug-09	471.9		158.30	475.7		
Sep-09	559.3		306.10	565.2		
Oct-09	612.0		541.80	611.2		
Nov-09	771.7		781.50	785.4		
Dec-09	1004.3	8,517.0	955.20	1,013.1	8,424.9	
Jan-10	987.2		991.10	1,023.2		
Feb-10	811.1		679.20	882.7		
Mar-10	737.9		656.00	808.0		
Apr-10	707.7		461.20	731.2		
May-10	561.3		292.00	575.2		
Jun-10	473.0		171.90	467.2		
Jul-10	525.2		117.30	523.8		
Aug-10	498.4		146.20	508.4		
Sep-10	621.6		332.40	614.0		
Oct-10	671.3		520.40	681.4		
Nov-10	761.7		717.60	808.2		
Dec-10	991.5	8,347.8	1162.50	893.9	8,517.4	
Jan-11	1273.3		1010.20	1,299.5		
Feb-11	916.0		905.60	871.4		
Mar-11	937.0		901.70	880.9		
Apr-11	777.3		511.20	775.1		
May-11	606.4		296.40	618.0		
Jun-11	516.9		161.00	516.8		
Jul-11	490.1		127.80	483.3		
Aug-11	558.1		217.90	531.4		
Sep-11	583.7		328.50	578.1		
Nov-11	658.1		513.30	671.9		
Nov-11	874.1		931.70	810.7		
Dec-11	1081.3	9,272.2	775.10	1,182.6	9,219.8	
Jan-12	1122.1		1118.10	1,092.9		
Feb-12	981.2		691.70	1,046.5		
Mar-12	814.3		756.20	833.0		
Apr-12	632.0		450.60	660.9		
May-12	635.1		350.80	618.9		
Jun-12	526.8		195.10	509.2		
Jul-12	509.3		140.10	496.2		
Aug-12	583.4		157.90	587.5		
Sep-12	558.3		271.00	582.3		
Oct-12	702.1		639.30	651.3		
Nov-12	950.0		969.60	867.1		
Dec-12	1294.3	9,309.1	1196.80	1,179.1	9,124.8	

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Marsh Lake

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,030.8		952.00	1,086.9		
Feb-13	1,020.2		665.40	1,098.9		
Mar-13	885.4		851.10	855.3		
Apr-13	823.2		639.90	754.9		
May-13	650.7		294.00	663.6		
Jun-13	531.7		112.40	556.5		
Jul-13	488.7		92.50	500.0		
Aug-13	574.7		98.90	609.0		
Sep-13	452.1		264.30	479.5		
Oct-13	717.3		501.40	737.2		
Nov-13	890.0		865.60	860.6		
Dec-13	1,144.2	9,208.9	1144.70	1,055.8	9,258.3	
Jan-14	1,034.0		745.80	1,196.0		
Feb-14	981.4		992.40	892.3		
Mar-14	881.7		855.10	849.6		
Apr-14	785.7		499.80	789.4		
May-14	504.8		269.50	530.3		
Jun-14	501.4		200.50	481.0		
Jul-14	511.3		98.00	519.7		
Aug-14	486.0		144.00	497.2		
Sep-14	537.9		307.10	543.3		
Oct-14	669.5		515.60	682.1		
Nov-14	761.6		772.80	779.8		
Dec-14	1,119.5	8,774.9	854.40	1,180.1	8,940.8	
Jan-15	989.1		927.00	1,058.0		
Feb-15	1,012.7		851.40	995.9		
Mar-15	702.1		671.30	764.4		
Apr-15	754.3		453.50	781.8		
May-15	528.1		192.90	592.9		
Jun-15	451.8		127.20	469.0		
Jul-15	528.7		115.70	528.1		
Aug-15	475.3		183.20	466.4		
Sep-15	655.4		332.70	647.7		
Oct-15	624.3		469.80	660.4		
Nov-15	857.3		759.20	882.4		
Dec-15	1,102.5	8,681.6	947.90	1,115.1	8,962.1	
Jan-16	936.7		827.6	1,056.7		
Feb-16	842.3		688.0	909.4		
Mar-16	830.2		611.6	923.1		
Apr-16	769.2					
May-16	583.4					
Jun-16	461.4					
Jul-16	519.6					
Aug-16	458.9					
Sep-16	637.2					
Oct-16	649.8					
Nov-16	868.2					
Dec-16	1,097.1	8,654.0			8,934.0	
Jan-17	1,039.7					
Feb-17	894.8					
Mar-17	908.3					
Apr-17	756.8					
May-17	574.0					
Jun-17	454.0					
Jul-17	511.2					
Aug-17	451.5					
Sep-17	627.0					
Oct-17	639.3					
Nov-17	854.2					
Dec-17	1,079.5	8,790.0			8,790.0	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (8,962.1 / 9,258.3) ^ {1/2} - 1 = -1.6\%$$

Note: January, February and March 2016 have been updated to include actuals.

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Lower Post

Residential	Annual			Annual		Regression Output:
	Monthly	UPC (kWh)	Actual / Forecast (Watson Lake)	Normalized	Normalized	
		UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	0.0		0.0	0.0		SUMMARY OUTPUT
Feb-95	0.0		0.0	0.0		Regression Statistics
Mar-95	0.0		0.0	0.0		Multiple R 0.778914297
Apr-95	0.0		0.0	0.0		R Square 0.606707482
May-95	0.0		0.0	0.0		Adjusted R Square 0.604497973
Jun-95	0.0		0.0	0.0		Standard Error 127.1001387
Jul-95	0.0		0.0	0.0		Observations 180
Aug-95	0.0		0.0	0.0		
Sep-95	0.0		0.0	0.0		ANOVA
Oct-95	0.0		0.0	0.0		
Nov-95	0.0		0.0	0.0		
Dec-95	0.0	-	0.0	0.0	-	
Jan-96	984.9		1605.20	847.5		
Feb-96	769.4		947.30	782.2		
Mar-96	801.0		874.30	807.7		
Apr-96	695.9		547.70	696.7		
May-96	580.7		366.40	561.8		
Jun-96	512.2		163.90	502.8		
Jul-96	550.0		103.30	545.5		
Aug-96	502.8		185.10	489.2		
Sep-96	576.3		354.70	557.8		
Oct-96	537.7		662.20	498.5		
Nov-96	782.9		1121.20	720.0		
Dec-96	811.8	8,105.6	1361.10	744.4	7,754.1	
Jan-97	1036.1		1406.60	975.4		
Feb-97	753.7		884.80	790.5		
Mar-97	682.7		943.90	662.6		
Apr-97	724.9		527.90	733.3		
May-97	565.9		311.80	568.0		
Jun-97	545.4		142.60	544.2		
Jul-97	572.7		84.10	575.6		
Aug-97	494.9		109.60	510.4		
Sep-97	588.1		271.10	601.8		
Oct-97	568.3		659.70	530.1		
Nov-97	735.9		935.80	744.5		
Dec-97	722.7	7,991.2	983.70	800.8	8,037.2	
Jan-98	1059.1		1409.70	997.1		
Feb-98	791.0		942.00	805.8		
Mar-98	740.0		843.40	758.6		
Apr-98	661.5		500.10	680.7		
May-98	553.5		211.00	594.6		
Jun-98	504.3		89.00	523.8		
Jul-98	460.3		65.70	470.4		
Aug-98	480.6		156.80	477.9		
Sep-98	569.9		320.70	564.5		
Oct-98	599.9		561.20	599.7		
Nov-98	790.3		958.10	790.3		
Dec-98	788.2	7,998.7	1252.70	762.6	8,025.9	
Jan-99	934.1		1350.20	895.0		
Feb-99	773.4		1066.40	740.2		
Mar-99	711.2		871.40	719.1		
Apr-99	678.3		506.40	695.0		
May-99	598.2		372.20	577.1		
Jun-99	539.7		140.20	539.4		
Jul-99	478.7		99.40	475.8		
Aug-99	498.9		127.80	507.4		
Sep-99	579.5		292.50	585.0		
Oct-99	577.4		519.80	593.1		
Nov-99	709.8		939.90	716.8		
Dec-99	698.4	7,777.5	1013.00	765.3	7,809.1	
Jan-00	921.1		1344.80	884.2		
Feb-00	844.0		956.00	853.3		
Mar-00	688.0		750.10	742.7		
Apr-00	664.4		590.90	648.6		
May-00	638.1		373.80	616.4		
Jun-00	526.5		158.00	519.3		
Jul-00	542.6		84.30	545.4		
Aug-00	520.3		216.90	494.4		
Sep-00	545.4		314.80	542.2		
Oct-00	616.7		575.80	610.8		
Nov-00	680.7		858.40	719.2		
Dec-00	756.5	7,944.4	1222.80	742.5	7,919.0	

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Lower Post

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	974.7		1043.40	1054.0		
Feb-01	692.0		1031.00	672.5		
Mar-01	683.1		844.90	701.2		
Apr-01	657.6		535.80	663.0		
May-01	578.5		366.60	559.5		
Jun-01	535.7		155.50	529.6		
Jul-01	505.8		120.30	494.8		
Aug-01	496.0		120.60	507.2		
Sep-01	537.2		299.60	539.9		
Oct-01	597.6		577.00	591.3		
Nov-01	670.7		975.00	664.2		
Dec-01	731.6	7,660.5	1275.40	697.3	7,674.3	
Jan-02	904.2		1246.30	905.2		
Feb-02	724.9		970.30	728.8		
Mar-02	724.4		991.60	686.0		
Apr-02	759.4		694.80	703.5		
May-02	592.8		365.90	574.1		
Jun-02	540.3		147.80	537.1		
Jul-02	468.1		121.60	456.6		
Aug-02	543.0		181.50	530.8		
Sep-02	531.5		331.00	522.1		
Oct-02	576.4		514.80	594.0		
Nov-02	670.3		821.90	722.8		
Dec-02	686.1	7,721.4	1117.90	712.5	7,673.4	
Jan-03	883.8		1177.50	911.3		
Feb-03	664.2		964.70	670.2		
Mar-03	665.2		899.50	662.3		
Apr-03	729.9		554.40	728.1		
May-03	647.8		341.60	638.5		
Jun-03	475.1		179.90	459.5		
Jul-03	488.7		56.60	502.2		
Aug-03	496.7		163.00	491.6		
Sep-03	533.7		330.20	524.6		
Oct-03	535.9		526.10	549.2		
Nov-03	683.7		963.90	681.4		
Dec-03	725.4	7,530.1	1095.50	760.4	7,579.5	
Jan-04	846.9		1365.60	801.9		
Feb-04	806.0		881.20	844.2		
Mar-04	709.3		809.90	740.9		
Apr-04	671.2		497.40	691.4		
May-04	507.4		292.30	517.1		
Jun-04	561.6		74.10	586.8		
Jul-04	514.3		35.60	536.0		
Aug-04	479.7		145.70	481.3		
Sep-04	510.5		370.70	485.8		
Oct-04	567.0		565.00	565.3		
Nov-04	782.7		875.50	814.5		
Dec-04	801.8	7,758.3	1070.70	846.3	7,911.5	
Jan-05	1013.0		1330.30	981.7		
Feb-05	610.3		941.80	625.1		
Mar-05	632.6		726.90	696.2		
Apr-05	618.9		464.80	651.7		
May-05	581.3		256.90	604.6		
Jun-05	444.7		126.60	449.6		
Jul-05	493.6		136.90	476.1		
Aug-05	448.9		162.20	444.1		
Sep-05	509.2		297.30	512.8		
Oct-05	621.2		541.70	628.5		
Nov-05	647.8		758.40	724.8		
Dec-05	742.9	7,364.2	1061.00	791.2	7,586.4	
Jan-06	943.0		1185.20	967.6		
Feb-06	910.4		1016.70	896.3		
Mar-06	826.7		960.50	800.3		
Apr-06	715.0		528.20	723.3		
May-06	583.7		371.10	563.0		
Jun-06	616.5		136.50	617.7		
Jul-06	548.5		79.20	553.3		
Aug-06	556.7		171.70	548.3		
Sep-06	563.1		292.40	568.6		
Oct-06	675.4		543.30	682.1		
Nov-06	837.3		1196.20	745.4		
Dec-06	906.0	8,682.3	1050.00	958.6	8,624.5	

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Lower Post

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1105.3		1102.40	1161.8		
Feb-07	909.0		1017.30	894.7		
Mar-07	920.0		1001.90	877.6		
Apr-07	949.7		543.00	952.3		
May-07	681.5		332.20	675.8		
Jun-07	544.3		122.60	550.8		
Jul-07	588.8		88.60	590.0		
Aug-07	533.7		143.10	536.3		
Sep-07	571.4		314.70	568.3		
Oct-07	691.3		553.10	694.1		
Nov-07	797.4		956.60	798.0		
Dec-07	858.5	9,150.7	1255.10	831.9	9,131.6	
Jan-08	1143.6		1300.10	1123.8		
Feb-08	992.4		1064.20	960.0		
Mar-08	792.0		833.30	814.6		
Apr-08	927.2		554.00	925.6		
May-08	649.4		295.60	657.8		
Jun-08	584.0		191.00	564.2		
Jul-08	564.7		131.50	549.3		
Aug-08	618.2		154.00	616.6		
Sep-08	578.6		304.20	579.5		
Oct-08	748.0		523.50	762.3		
Nov-08	826.8		882.50	856.0		
Dec-08	851.8	9,276.6	1386.50	774.6	9,184.3	
Jan-09	1345.1		1329.30	1314.1		
Feb-09	1012.9		1089.50	970.8		
Mar-09	960.5		1054.20	897.9		
Apr-09	835.7		590.00	820.2		
May-09	641.9		356.00	627.1		
Jun-09	535.3		131.20	538.5		
Jul-09	630.9		89.00	631.9		
Aug-09	559.6		134.40	565.5		
Sep-09	676.2		279.40	686.7		
Oct-09	690.8		606.90	672.9		
Nov-09	787.5		996.50	772.7		
Dec-09	955.1	9,631.4	1340.70	895.5	9,393.8	
Jan-10	1239.3		1219.70	1250.6		
Feb-10	900.0		965.80	905.6		
Mar-10	769.8		763.50	819.3		
Apr-10	905.1		502.70	923.2		
May-10	720.6		277.70	735.9		
Jun-10	557.4		142.70	556.1		
Jul-10	515.0		70.80	523.1		
Aug-10	515.9		119.60	527.5		
Sep-10	586.9		316.80	583.0		
Oct-10	652.6		501.80	675.3		
Nov-10	767.1		904.20	787.9		
Dec-10	981.6	9,111.3	1292.10	940.8	9,228.4	
Jan-11	1298.7		1201.00	1317.2		
Feb-11	859.0		1004.60	849.6		
Mar-11	1010.9		1032.90	956.5		
Apr-11	723.1		587.50	708.6		
May-11	681.1		271.10	699.0		
Jun-11	612.7		143.10	611.3		
Jul-11	541.5		104.40	536.6		
Aug-11	590.5		195.10	573.0		
Sep-11	762.2		292.40	767.7		
Nov-11	652.0		511.90	670.7		
Nov-11	688.9		1059.10	649.9		
Dec-11	900.8	9,321.3	1006.30	970.2	9,310.3	
Jan-12	1186.9		1273.00	1177.6		
Feb-12	899.0		935.50	916.3		
Mar-12	887.8		909.00	881.2		
Apr-12	712.0		512.60	726.4		
May-12	693.1		340.20	684.3		
Jun-12	486.7		149.70	482.8		
Jul-12	589.1		77.80	594.5		
Aug-12	593.1		134.00	599.2		
Sep-12	362.6		278.80	373.4		
Oct-12	628.6		714.50	569.3		
Nov-12	779.8		1112.80	720.2		
Dec-12	936.6	8,755.4	1356.20	871.1	8,596.1	

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Lower Post

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,365.5		1129.10	1,411.7		
Feb-13	760.6		765.80	843.4		
Mar-13	1,157.2		950.70	1,134.5		
Apr-13	982.1		690.10	928.0		
May-13	363.2		304.50	368.2		
Jun-13	698.5		96.30	715.1		
Jul-13	432.2		105.10	427.1		
Aug-13	685.2		82.20	711.3		
Sep-13	334.0		239.10	360.0		
Oct-13	647.0		490.20	674.1		
Nov-13	632.5		1021.30	608.1		
Dec-13	1,121.1	9,179.1	1248.80	1,097.0	9,278.5	
Jan-14	1,343.0		937.70	1,463.1		
Feb-14	1,005.4		1204.40	919.0		
Mar-14	1,038.9		1008.90	993.8		
Apr-14	914.5		570.50	906.5		
May-14	752.2		331.08	746.9		
Jun-14	547.8		186.80	529.5		
Jul-14	583.8		87.60	585.4		
Aug-14	486.4		144.80	488.3		
Sep-14	545.5		295.80	549.7		
Oct-14	639.8		539.70	647.8		
Nov-14	630.9		936.40	639.3		
Dec-14	937.6	9,425.9	1176.70	941.3	9,410.7	
Jan-15	1,115.7		1022.80	1,203.0		
Feb-15	824.6		956.70	833.7		
Mar-15	816.2		766.30	864.6		
Apr-15	537.5		497.40	557.8		
May-15	543.9		210.80	585.0		
Jun-15	431.2		111.80	441.9		
Jul-15	529.8		92.40	529.5		
Aug-15	475.6		147.50	476.5		
Sep-15	610.7		336.10	599.3		
Oct-15	652.3		523.70	666.6		
Nov-15	672.4		887.80	699.5		
Dec-15	829.3	8,039.4	1160.30	839.3	8,296.8	
Jan-16	1,197.6		1,099.3	1,255.3		
Feb-16	900.2		930.8	919.3		
Mar-16	848.4		724.3	913.0		
Apr-16	527.4					
May-16	553.2					
Jun-16	417.9					
Jul-16	500.7					
Aug-16	450.6					
Sep-16	566.7					
Oct-16	630.3					
Nov-16	661.5					
Dec-16	793.7	8,048.1			8,189.5	
Jan-17	1,187.0					
Feb-17	869.3					
Mar-17	863.3					
Apr-17	498.7					
May-17	523.1					
Jun-17	395.2					
Jul-17	473.5					
Aug-17	426.1					
Sep-17	535.9					
Oct-17	596.0					
Nov-17	625.5					
Dec-17	750.5	7,744.2			7,744.2	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (8,296.8 / 9,278.5) ^ (1/2) - 1 = **-5.4%**

Note: January, February and March 2016 have been updated to include actuals.

ATCO Electric Yukon
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Section 2
Attachment 14

Upper Liard

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	0.0		938.70	97.8		SUMMARY OUTPUT
Feb-95	0.0		941.90	12.1		Regression Statistics
Mar-95	0.0		855.60	11.4		Multiple R 0.798480331
Apr-95	0.0		492.70	18.0		R Square 0.63757084
May-95	0.0		242.50	23.6		Adjusted R Square 0.635534721
Jun-95	0.0		97.00	13.4		Standard Error 97.31317985
Jul-95	0.0		113.00	-6.7		Observations 180
Aug-95	0.0		189.90	-12.7		ANOVA
Sep-95	0.0		224.90	25.8		
Oct-95	0.0		552.70	2.5		
Nov-95	0.0		1000.20	-13.3		
Dec-95	0.0	-	1295.40	-34.4	137.6	
Jan-96	956.3		1605.20	844.0		
Feb-96	770.8		947.30	781.2		
Mar-96	770.4		874.30	775.9		
Apr-96	650.0		547.70	650.7		
May-96	547.1		366.40	531.7		
Jun-96	649.8		163.90	642.1		
Jul-96	335.5		103.30	331.9		
Aug-96	458.3		185.10	447.2		
Sep-96	500.1		354.70	484.9		
Oct-96	539.2		662.20	507.1		
Nov-96	748.1		1121.20	696.6		
Dec-96	749.6	7,675.2	1361.10	694.5	7,387.8	
Jan-97	984.6		1406.60	934.9		
Feb-97	734.6		884.80	764.7		
Mar-97	599.6		943.90	583.2		
Apr-97	590.9		527.90	597.8		
May-97	527.0		311.80	528.8		
Jun-97	485.4		142.60	484.4		
Jul-97	451.5		84.10	453.9		
Aug-97	460.1		109.60	472.8		
Sep-97	497.7		271.10	508.9		
Oct-97	572.4		659.70	541.1		
Nov-97	664.3		935.80	671.3		
Dec-97	596.9	7,165.1	983.70	660.8	7,202.7	
Jan-98	997.9		1409.70	947.2		
Feb-98	653.0		942.00	665.0		
Mar-98	552.3		843.40	567.6		
Apr-98	563.6		500.10	579.3		
May-98	517.3		211.00	550.9		
Jun-98	448.8		89.00	464.7		
Jul-98	459.4		65.70	467.6		
Aug-98	494.0		156.80	491.7		
Sep-98	506.3		320.70	501.8		
Oct-98	554.5		561.20	554.3		
Nov-98	686.9		958.10	686.9		
Dec-98	694.5	7,128.4	1252.70	673.6	7,150.7	
Jan-99	908.0		1350.20	876.1		
Feb-99	683.1		1066.40	655.9		
Mar-99	608.7		871.40	615.2		
Apr-99	622.1		506.40	635.8		
May-99	501.8		372.20	484.5		
Jun-99	477.3		140.20	477.1		
Jul-99	467.1		99.40	464.6		
Aug-99	479.7		127.80	486.6		
Sep-99	482.1		292.50	486.5		
Oct-99	493.6		519.80	506.5		
Nov-99	740.0		939.90	745.7		
Dec-99	472.8	6,936.1	1013.00	527.4	6,961.9	
Jan-00	873.3		1344.80	843.1		
Feb-00	701.5		956.00	709.1		
Mar-00	554.6		750.10	599.3		
Apr-00	606.1		590.90	593.1		
May-00	547.1		373.80	529.3		
Jun-00	475.5		158.00	469.6		
Jul-00	464.6		84.30	467.0		
Aug-00	484.9		216.90	463.7		
Sep-00	534.4		314.80	531.8		
Oct-00	538.4		575.80	533.6		
Nov-00	591.8		858.40	623.2		
Dec-00	674.3	7,046.4	1222.80	662.8	7,025.7	

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Attachment 14

Upper Liard

Residential	Annual		Normalized	Annual		Regression Output:
	Actual / Forecast	(Watson Lake)		UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	771.0		1043.40	835.9		
Feb-01	587.0		1031.00	571.0		
Mar-01	619.8		844.90	634.6		
Apr-01	487.0		535.80	491.4		
May-01	498.9		366.60	483.4		
Jun-01	481.6		155.50	476.6		
Jul-01	433.9		120.30	424.8		
Aug-01	452.7		120.60	461.9		
Sep-01	451.7		299.60	453.9		
Oct-01	506.5		577.00	501.3		
Nov-01	635.8		975.00	630.5		
Dec-01	694.0	6,620.0	1275.40	666.0	6,631.3	
Jan-02	745.3		1246.30	746.1		
Feb-02	714.6		970.30	717.8		
Mar-02	524.9		991.60	493.5		
Apr-02	580.3		694.80	534.6		
May-02	554.0		365.90	538.7		
Jun-02	417.8		147.80	415.2		
Jul-02	450.7		121.60	441.3		
Aug-02	462.6		181.50	452.6		
Sep-02	452.6		331.00	444.9		
Oct-02	555.5		514.80	570.0		
Nov-02	655.4		821.90	698.3		
Dec-02	586.8	6,700.5	1117.90	608.4	6,661.3	
Jan-03	814.0		1177.50	836.5		
Feb-03	653.0		964.70	657.9		
Mar-03	618.8		899.50	616.4		
Apr-03	618.9		554.40	617.5		
May-03	551.8		341.60	544.2		
Jun-03	476.5		179.90	463.8		
Jul-03	477.4		56.60	488.5		
Aug-03	494.2		163.00	490.0		
Sep-03	511.6		330.20	504.2		
Oct-03	498.6		526.10	509.5		
Nov-03	740.8		963.90	738.9		
Dec-03	735.3	7,190.9	1095.50	763.9	7,231.3	
Jan-04	1028.6		1365.60	991.8		
Feb-04	704.6		881.20	735.8		
Mar-04	635.3		809.90	661.2		
Apr-04	612.8		497.40	629.4		
May-04	505.5		292.30	513.4		
Jun-04	452.3		74.10	472.9		
Jul-04	487.1		35.60	504.8		
Aug-04	447.4		145.70	448.7		
Sep-04	522.6		370.70	502.4		
Oct-04	570.4		565.00	569.0		
Nov-04	617.9		875.50	644.0		
Dec-04	637.5	7,222.0	1070.70	674.0	7,347.2	
Jan-05	942.6		1330.30	917.0		
Feb-05	624.9		941.80	637.0		
Mar-05	567.5		726.90	619.5		
Apr-05	632.6		464.80	659.4		
May-05	481.3		256.90	500.4		
Jun-05	440.5		126.60	444.6		
Jul-05	466.0		136.90	451.8		
Aug-05	516.6		162.20	512.6		
Sep-05	585.5		297.30	588.4		
Oct-05	619.4		541.70	625.3		
Nov-05	692.7		758.40	755.6		
Dec-05	789.8	7,359.3	1061.00	829.3	7,541.0	
Jan-06	953.9		1185.20	974.1		
Feb-06	818.6		1016.70	807.1		
Mar-06	786.2		960.50	764.5		
Apr-06	714.9		528.20	721.7		
May-06	545.3		371.10	528.3		
Jun-06	515.3		136.50	516.2		
Jul-06	499.9		79.20	503.9		
Aug-06	454.7		171.70	447.8		
Sep-06	479.7		292.40	484.2		
Oct-06	613.8		543.30	619.3		
Nov-06	691.2		1196.20	616.2		
Dec-06	853.0	7,926.5	1050.00	895.9	7,879.2	

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Upper Liard

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	954.3		1102.40	1000.5		
Feb-07	732.2		1017.30	720.5		
Mar-07	818.3		1001.90	783.6		
Apr-07	703.6		543.00	705.8		
May-07	523.8		332.20	519.2		
Jun-07	486.5		122.60	491.9		
Jul-07	494.6		88.60	495.6		
Aug-07	438.0		143.10	440.1		
Sep-07	506.6		314.70	504.1		
Oct-07	538.9		553.10	541.3		
Nov-07	666.6		956.60	667.1		
Dec-07	744.8	7,608.3	1255.10	723.1	7,592.6	
Jan-08	1026.0		1300.10	1009.9		
Feb-08	874.3		1064.20	847.8		
Mar-08	661.1		833.30	679.6		
Apr-08	750.3		554.00	749.0		
May-08	447.3		295.60	454.2		
Jun-08	490.7		191.00	474.5		
Jul-08	540.2		131.50	527.6		
Aug-08	523.8		154.00	522.5		
Sep-08	564.6		304.20	565.3		
Oct-08	622.5		523.50	634.2		
Nov-08	625.9		882.50	649.7		
Dec-08	730.6	7,857.3	1386.50	667.5	7,781.8	
Jan-09	1148.9		1329.30	1123.5		
Feb-09	788.6		1089.50	754.1		
Mar-09	857.2		1054.20	806.0		
Apr-09	627.1		590.00	614.4		
May-09	697.3		356.00	685.2		
Jun-09	552.9		131.20	555.5		
Jul-09	480.7		89.00	481.6		
Aug-09	522.1		134.40	527.0		
Sep-09	529.6		279.40	538.2		
Oct-09	573.9		606.90	559.3		
Nov-09	700.6		996.50	688.5		
Dec-09	866.0	8,344.9	1340.70	817.4	8,150.7	
Jan-10	1036.8		1219.70	1046.1		
Feb-10	742.8		965.80	747.4		
Mar-10	772.1		763.50	812.6		
Apr-10	645.6		502.70	660.5		
May-10	533.7		277.70	546.2		
Jun-10	568.3		142.70	567.3		
Jul-10	496.4		70.80	503.0		
Aug-10	501.4		119.60	510.9		
Sep-10	532.0		316.80	528.8		
Oct-10	654.5		501.80	673.0		
Nov-10	640.5		904.20	657.4		
Dec-10	747.0	7,871.2	1292.10	713.6	7,966.9	
Jan-11	987.5		1201.00	1002.6		
Feb-11	726.7		1004.60	719.0		
Mar-11	859.4		1032.90	814.9		
Apr-11	604.3		587.50	592.5		
May-11	695.2		271.10	709.8		
Jun-11	498.8		143.10	497.7		
Jul-11	465.5		104.40	461.5		
Aug-11	526.9		195.10	512.6		
Sep-11	548.0		292.40	552.4		
Nov-11	602.0		511.90	617.4		
Nov-11	655.7		1059.10	623.8		
Dec-11	725.5	7,895.5	1006.30	782.3	7,886.6	
Jan-12	996.8		1273.00	989.2		
Feb-12	694.2		935.50	708.4		
Mar-12	720.6		909.00	715.2		
Apr-12	622.8		512.60	634.6		
May-12	582.2		340.20	575.0		
Jun-12	516.5		149.70	513.3		
Jul-12	463.7		77.80	468.1		
Aug-12	526.6		134.00	531.6		
Sep-12	530.6		278.80	539.3		
Oct-12	696.0		714.50	647.5		
Nov-12	747.7		1112.80	699.0		
Dec-12	921.2	8,019.1	1356.20	867.6	7,888.8	

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Upper Liard

Residential	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake)	MHDD	UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,277.3		1129.10	1,315.1		
Feb-13	855.9		765.80	923.5		
Mar-13	777.7		950.70	759.2		
Apr-13	763.2		690.10	718.9		
May-13	676.9		304.50	680.9		
Jun-13	566.5		96.30	580.1		
Jul-13	517.6		105.10	513.3		
Aug-13	596.3		82.20	617.7		
Sep-13	559.6		239.10	580.9		
Oct-13	651.6		490.20	673.8		
Nov-13	618.6		1021.30	598.7		
Dec-13	940.9	8,802.0	1248.80	921.2	8,883.3	
Jan-14	1,095.2		937.70	1,193.3		
Feb-14	766.4		1204.40	695.8		
Mar-14	826.4		1008.90	789.5		
Apr-14	823.1		570.50	816.6		
May-14	596.8		331.08	592.5		
Jun-14	526.8		186.80	511.9		
Jul-14	530.0		87.60	531.3		
Aug-14	521.1		144.80	522.7		
Sep-14	604.0		295.80	607.4		
Oct-14	591.6		539.70	598.1		
Nov-14	679.3		936.40	686.1		
Dec-14	925.9	8,486.6	1176.70	928.9	8,474.2	
Jan-15	1,018.4		1022.80	1,089.7		
Feb-15	880.8		956.70	888.3		
Mar-15	745.4		766.30	785.0		
Apr-15	835.3		497.40	851.9		
May-15	663.8		210.80	697.4		
Jun-15	475.5		111.80	484.3		
Jul-15	559.2		92.40	558.9		
Aug-15	528.0		147.50	528.8		
Sep-15	661.3		336.10	652.0		
Oct-15	672.2		523.70	683.8		
Nov-15	772.6		887.80	794.7		
Dec-15	732.6	8,545.3	1160.30	740.9	8,755.8	
Jan-16	953.5		1,099.3	1,000.7		
Feb-16	714.1		930.8	729.7		
Mar-16	668.4		724.3	721.3		
Apr-16	845.7					
May-16	692.4					
Jun-16	480.8					
Jul-16	554.9					
Aug-16	524.9					
Sep-16	647.3					
Oct-16	678.9					
Nov-16	789.0					
Dec-16	735.5	8,285.6			8,401.2	
Jan-17	993.5					
Feb-17	724.4					
Mar-17	716.1					
Apr-17	839.6					
May-17	687.4					
Jun-17	477.3					
Jul-17	550.9					
Aug-17	521.2					
Sep-17	642.7					
Oct-17	674.0					
Nov-17	783.3					
Dec-17	730.2	8,340.7			8,340.7	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (8,755.8 / 8,883.3) ^ (1/2) - 1 = **-0.7%**

Note: January, February and March 2016 have been updated to include actuals.

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Watson Lake

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized	Normalized	
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	951.2		938.70	1061.6		SUMMARY OUTPUT
Feb-95	794.6		941.90	808.2		Regression Statistics
Mar-95	800.6		855.60	813.5		Multiple R 0.9088813
Apr-95	673.0		492.70	693.3		R Square 0.826065217
May-95	569.3		242.50	596.0		Adjusted R Square 0.825088055
Jun-95	559.7		97.00	574.8		Standard Error 66.80316735
Jul-95	528.4		113.00	520.8		Observations 180
Aug-95	556.3		189.90	542.1		
Sep-95	586.5		224.90	615.6		ANOVA
Oct-95	648.4		552.70	651.2		
Nov-95	792.3		1000.20	777.4		
Dec-95	956.1	8,416.6	1295.40	917.3	8,571.8	
Jan-96	1146.6		1605.20	1019.9		
Feb-96	954.7		947.30	966.4		
Mar-96	794.0		874.30	800.3		
Apr-96	719.6		547.70	720.3		
May-96	651.1		366.40	633.7		
Jun-96	561.7		163.90	553.0		
Jul-96	545.2		103.30	541.1		
Aug-96	581.3		185.10	568.7		
Sep-96	616.1		354.70	599.0		
Oct-96	687.7		662.20	651.5		
Nov-96	880.0		1121.20	822.0		
Dec-96	946.2	9,084.1	1361.10	884.0	8,759.9	
Jan-97	1190.8		1406.60	1134.8		
Feb-97	901.1		884.80	935.0		
Mar-97	725.6		943.90	707.1		
Apr-97	705.8		527.90	713.6		
May-97	654.9		311.80	656.9		
Jun-97	566.7		142.60	565.6		
Jul-97	544.8		84.10	547.5		
Aug-97	555.6		109.60	569.9		
Sep-97	591.7		271.10	604.3		
Oct-97	672.0		659.70	636.8		
Nov-97	781.4		935.80	789.3		
Dec-97	830.6	8,721.0	983.70	902.7	8,763.4	
Jan-98	1053.8		1409.70	996.6		
Feb-98	768.1		942.00	781.7		
Mar-98	702.4		843.40	719.6		
Apr-98	707.2		500.10	724.8		
May-98	564.5		211.00	602.3		
Jun-98	527.3		89.00	545.3		
Jul-98	523.5		65.70	532.8		
Aug-98	538.0		156.80	535.6		
Sep-98	579.5		320.70	574.5		
Oct-98	663.6		561.20	663.4		
Nov-98	748.5		958.10	748.5		
Dec-98	871.3	8,247.6	1252.70	847.7	8,272.7	
Jan-99	984.2		1350.20	948.2		
Feb-99	788.1		1066.40	757.5		
Mar-99	744.4		871.40	751.7		
Apr-99	715.0		506.40	730.4		
May-99	630.6		372.20	611.1		
Jun-99	546.9		140.20	546.7		
Jul-99	526.5		99.40	523.8		
Aug-99	547.0		127.80	554.8		
Sep-99	624.6		292.50	629.6		
Oct-99	628.3		519.80	642.8		
Nov-99	766.4		939.90	772.9		
Dec-99	796.8	8,298.7	1013.00	858.4	8,327.8	
Jan-00	1138.5		1344.80	1104.5		
Feb-00	893.6		956.00	902.3		
Mar-00	654.0		750.10	704.4		
Apr-00	703.1		590.90	688.5		
May-00	635.1		373.80	615.1		
Jun-00	558.3		158.00	551.7		
Jul-00	546.8		84.30	549.4		
Aug-00	588.7		216.90	564.8		
Sep-00	603.2		314.80	600.3		
Oct-00	663.8		575.80	658.4		
Nov-00	757.6		858.40	793.1		
Dec-00	971.1	8,714.1	1222.80	958.2	8,690.7	

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Watson Lake

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	931.7		1043.40	1004.8		
Feb-01	812.8		1031.00	794.8		
Mar-01	727.0		844.90	743.7		
Apr-01	677.2		535.80	682.1		
May-01	651.8		366.60	634.3		
Jun-01	563.5		155.50	557.8		
Jul-01	537.8		120.30	527.6		
Aug-01	554.8		120.60	565.1		
Sep-01	547.3		299.60	549.7		
Oct-01	651.6		577.00	645.7		
Nov-01	793.0		975.00	787.0		
Dec-01	901.2	8,349.5	1275.40	869.5	8,362.2	
Jan-02	966.5		1246.30	967.5		
Feb-02	816.8		970.30	820.3		
Mar-02	725.4		991.60	690.0		
Apr-02	741.5		694.80	689.9		
May-02	641.8		365.90	624.6		
Jun-02	544.3		147.80	541.3		
Jul-02	542.2		121.60	531.6		
Aug-02	610.5		181.50	599.2		
Sep-02	557.5		331.00	548.9		
Oct-02	681.8		514.80	698.1		
Nov-02	762.4		821.90	810.8		
Dec-02	828.1	8,418.9	1117.90	852.4	8,374.6	
Jan-03	947.5		1177.50	972.9		
Feb-03	770.3		964.70	775.8		
Mar-03	703.6		899.50	700.9		
Apr-03	773.8		554.40	772.1		
May-03	603.0		341.60	594.4		
Jun-03	555.9		179.90	541.6		
Jul-03	563.4		56.60	575.9		
Aug-03	548.7		163.00	544.0		
Sep-03	609.4		330.20	601.0		
Oct-03	649.5		526.10	661.7		
Nov-03	795.5		963.90	793.4		
Dec-03	968.0	8,488.5	1095.50	1000.3	8,534.1	
Jan-04	971.8		1365.60	930.3		
Feb-04	807.1		881.20	842.3		
Mar-04	749.8		809.90	778.9		
Apr-04	746.1		497.40	764.7		
May-04	588.5		292.30	597.4		
Jun-04	605.4		74.10	628.6		
Jul-04	573.5		35.60	593.5		
Aug-04	565.5		145.70	566.9		
Sep-04	646.4		370.70	623.6		
Oct-04	650.3		565.00	648.7		
Nov-04	779.2		875.50	808.6		
Dec-04	897.3	8,580.9	1070.70	938.4	8,722.2	
Jan-05	1053.1		1330.30	1024.2		
Feb-05	807.3		941.80	821.0		
Mar-05	746.3		726.90	804.9		
Apr-05	713.9		464.80	744.2		
May-05	627.3		256.90	648.8		
Jun-05	584.5		126.60	589.1		
Jul-05	551.0		136.90	534.9		
Aug-05	565.0		162.20	560.6		
Sep-05	689.7		297.30	693.0		
Oct-05	625.8		541.70	632.6		
Nov-05	735.5		758.40	806.5		
Dec-05	894.5	8,593.9	1061.00	939.1	8,798.8	
Jan-06	918.5		1185.20	941.2		
Feb-06	910.7		1016.70	897.7		
Mar-06	916.1		960.50	891.7		
Apr-06	725.6		528.20	733.3		
May-06	646.4		371.10	627.3		
Jun-06	577.8		136.50	578.8		
Jul-06	587.2		79.20	591.6		
Aug-06	577.8		171.70	570.0		
Sep-06	638.5		292.40	643.6		
Oct-06	664.2		543.30	670.4		
Nov-06	843.2		1196.20	758.5		
Dec-06	982.7	8,988.6	1050.00	1031.1	8,935.2	

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Watson Lake

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	972.0		1102.40	1024.1		
Feb-07	965.4		1017.30	952.2		
Mar-07	878.6		1001.90	839.5		
Apr-07	751.5		543.00	753.9		
May-07	690.2		332.20	684.9		
Jun-07	604.7		122.60	610.7		
Jul-07	563.4		88.60	564.5		
Aug-07	577.4		143.10	579.8		
Sep-07	586.3		314.70	583.4		
Oct-07	652.4		553.10	655.1		
Nov-07	843.3		956.60	843.8		
Dec-07	804.9	8,890.0	1255.10	780.4	8,872.4	
Jan-08	1123.4		1300.10	1105.3		
Feb-08	1032.5		1064.20	1002.6		
Mar-08	834.6		833.30	855.4		
Apr-08	763.8		554.00	762.3		
May-08	686.4		295.60	694.2		
Jun-08	567.1		191.00	548.8		
Jul-08	590.6		131.50	576.5		
Aug-08	597.4		154.00	595.9		
Sep-08	591.5		304.20	592.4		
Oct-08	660.3		523.50	673.5		
Nov-08	841.2		882.50	868.1		
Dec-08	931.2	9,220.2	1386.50	860.0	9,135.0	
Jan-09	1141.3		1329.30	1112.7		
Feb-09	942.0		1089.50	903.1		
Mar-09	866.4		1054.20	808.7		
Apr-09	811.0		590.00	796.7		
May-09	661.3		356.00	647.6		
Jun-09	570.9		131.20	573.9		
Jul-09	600.9		89.00	601.8		
Aug-09	541.2		134.40	546.7		
Sep-09	622.4		279.40	632.1		
Oct-09	665.1		606.90	648.7		
Nov-09	780.8		996.50	767.1		
Dec-09	964.6	9,168.0	1340.70	909.7	8,948.9	
Jan-10	1092.8		1219.70	1103.2		
Feb-10	861.3		965.80	866.4		
Mar-10	780.5		763.50	826.2		
Apr-10	759.0		502.70	775.7		
May-10	647.7		277.70	661.9		
Jun-10	582.5		142.70	581.3		
Jul-10	570.7		70.80	578.1		
Aug-10	528.8		119.60	539.5		
Sep-10	610.1		316.80	606.4		
Oct-10	735.7		501.80	756.7		
Nov-10	745.4		904.20	764.6		
Dec-10	912.1	8,826.6	1292.10	874.5	8,934.6	
Jan-11	1147.8		1201.00	1164.8		
Feb-11	886.2		1004.60	877.6		
Mar-11	972.2		1032.90	922.0		
Apr-11	828.2		587.50	814.8		
May-11	682.2		271.10	698.6		
Jun-11	614.3		143.10	613.0		
Jul-11	546.7		104.40	542.2		
Aug-11	566.0		195.10	549.9		
Sep-11	642.2		292.40	647.2		
Oct-11	668.4		511.90	685.8		
Nov-11	794.5		1059.10	758.6		
Dec-11	924.7	9,273.4	1006.30	988.7	9,263.3	
Jan-12	1124.2		1273.00	1115.7		
Feb-12	934.5		935.50	950.5		
Mar-12	865.6		909.00	859.5		
Apr-12	778.7		512.60	791.9		
May-12	710.4		340.20	702.3		
Jun-12	645.1		149.70	641.5		
Jul-12	588.6		77.80	593.6		
Aug-12	572.5		134.00	578.1		
Sep-12	564.4		278.80	574.3		
Oct-12	690.0		714.50	635.3		
Nov-12	773.5		1112.80	718.5		
Dec-12	1002.4	9,249.9	1356.20	942.0	9,103.0	

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Watson Lake

Residential	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake)	MHDD	UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,132.4		1129.10	1,175.0		
Feb-13	913.2		765.80	989.5		
Mar-13	875.6		950.70	854.7		
Apr-13	807.4		690.10	757.5		
May-13	736.7		304.50	741.3		
Jun-13	665.0		96.30	680.3		
Jul-13	594.5		105.10	589.8		
Aug-13	587.0		82.20	611.0		
Sep-13	538.9		239.10	562.9		
Oct-13	649.6		490.20	674.6		
Nov-13	763.2		1021.30	740.7		
Dec-13	1,018.9	9,282.4	1248.80	996.7	9,374.1	
Jan-14	1,046.8		937.70	1,157.5		
Feb-14	898.5		1204.40	818.8		
Mar-14	947.2		1008.90	905.6		
Apr-14	774.1		570.50	766.8		
May-14	703.0		331.08	698.2		
Jun-14	597.6		186.80	580.8		
Jul-14	591.1		87.60	592.6		
Aug-14	529.2		144.80	530.9		
Sep-14	571.9		295.80	575.8		
Oct-14	683.5		539.70	690.9		
Nov-14	737.2		936.40	744.9		
Dec-14	1,019.1	9,099.1	1176.70	1,022.5	9,085.1	
Jan-15	1,084.7		1022.80	1,165.2		
Feb-15	892.4		956.70	900.8		
Mar-15	819.6		766.30	864.3		
Apr-15	728.9		497.40	747.6		
May-15	645.2		210.80	683.1		
Jun-15	536.7		111.80	546.5		
Jul-15	552.7		92.40	552.5		
Aug-15	521.9		147.50	522.7		
Sep-15	626.0		336.10	615.5		
Oct-15	680.6		523.70	693.8		
Nov-15	803.0		887.80	828.0		
Dec-15	951.9	8,843.7	1160.30	961.1	9,081.0	
Jan-16	1,081.9		1,099.3	1,135.1		
Feb-16	884.0		930.8	901.6		
Mar-16	839.9		724.3	899.5		
Apr-16	735.8					
May-16	672.4					
Jun-16	537.9					
Jul-16	543.8					
Aug-16	514.4					
Sep-16	605.8					
Oct-16	682.8					
Nov-16	815.0					
Dec-16	946.0	8,859.7			8,990.1	
Jan-17	1,117.3					
Feb-17	887.4					
Mar-17	885.3					
Apr-17	724.2					
May-17	661.8					
Jun-17	529.5					
Jul-17	535.2					
Aug-17	506.3					
Sep-17	596.3					
Oct-17	672.1					
Nov-17	802.1					
Dec-17	931.1	8,848.5			8,848.5	

2 year Compound Annual Growth Rate =
= (2015 Normalized UPC / 2013 Normalized UPC) ^ (1/(2015 - 2013)) - 1 =
= (9,081.0 / 9,374.1) ^ (1/2) - 1 = **-1.6%**

Note: January, February and March 2016 have been updated to include actuals.

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Keno City

Residential	Annual		(Whitehorse)	Annual			
	Actual / Forecast			Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)		
Regression Output:							
SUMMARY OUTPUT							
Regression Statistics							
Multiple R0.465746315							
R Square0.21691963							
Adjusted R Square0.212520302							
Standard Error111.695947							
Observations180							
ANOVA							
dfSSMSFSignificance F							
Regression1615158.9518615158.951849.307447274.4506E-11							
Residual1782220725.25512475.98458							
Total1792835884.207							
CoefficientsStandard Errort StatP-valueLower 95%Upper 95%Lower 95.0%Upper 95.0%							
Intercept200.407063816.064657312.475028894.53107E-26168.7053761232.1087515168.7053761232.1087515							
WH-HDD0.177382460.0252612257.0219261794.4506E-110.127532440.2272324790.127532440.227232479							
Jan-95	368.9		1020.10	376.3			
Feb-95	306.5		840.10	302.7			
Mar-95	418.1		880.00	402.6			
Apr-95	320.0		439.90	331.9			
May-95	225.1		250.70	237.2			
Jun-95	293.7		139.00	297.5			
Jul-95	233.5		96.60	236.7			
Aug-95	257.7		198.30	251.9			
Sep-95	323.1		226.50	339.3			
Oct-95	294.8		524.90	297.5			
Nov-95	371.1		894.40	355.8			
Dec-95	423.1	3,835.6	1048.60	409.6	3,839.0		
Jan-96	436.6		1530.10	353.5			
Feb-96	362.6		835.80	359.6			
Mar-96	320.7		805.80	318.3			
Apr-96	253.1		526.00	249.8			
May-96	268.9		357.30	262.1			
Jun-96	278.0		193.60	272.2			
Jul-96	289.9		124.90	288.0			
Aug-96	292.4		227.30	281.5			
Sep-96	347.6		362.60	339.6			
Oct-96	368.8		679.90	344.0			
Nov-96	431.7		975.00	402.1			
Dec-96	330.3	3,980.5	1155.80	297.7	3,768.4		
Jan-97	483.7		1185.70	461.6			
Feb-97	370.7		656.50	399.5			
Mar-97	354.8		855.40	343.6			
Apr-97	371.3		484.00	375.4			
May-97	277.3		331.10	275.1			
Jun-97	267.5		148.90	269.6			
Jul-97	262.8		92.80	266.7			
Aug-97	278.2		130.00	284.6			
Sep-97	300.7		282.10	307.0			
Oct-97	341.4		641.00	323.5			
Nov-97	284.8		685.80	306.6			
Dec-97	311.1	3,904.3	762.00	348.4	3,961.5		
Jan-98	384.7		1165.70	366.2			
Feb-98	458.9		719.10	476.6			
Mar-98	239.7		756.60	246.1			
Apr-98	289.3		458.60	297.9			
May-98	254.4		270.60	262.9			
Jun-98	244.5		119.50	251.8			
Jul-98	214.4		111.60	214.9			
Aug-98	299.2		189.20	295.0			
Sep-98	300.4		327.80	298.6			
Oct-98	363.7		557.70	360.6			
Nov-98	314.7		792.30	317.5			
Dec-98	244.8	3,608.7	1051.80	230.7	3,618.9		
Jan-99	360.0		1183.10	338.4			
Feb-99	300.7		976.40	272.7			
Mar-99	274.4		734.00	284.8			
Apr-99	328.5		508.80	328.2			
May-99	218.9		391.90	206.0			
Jun-99	207.7		153.90	208.9			
Jul-99	289.3		108.60	290.3			
Aug-99	310.0		145.70	313.6			
Sep-99	337.6		311.20	338.8			
Oct-99	369.9		499.80	377.1			
Nov-99	409.0		792.50	411.8			
Dec-99	270.8	3,676.8	844.00	293.6	3,664.1		
Jan-00	271.5		1082.90	267.7			
Feb-00	236.7		735.20	251.5			
Mar-00	230.2		659.20	253.8			
Apr-00	199.8		515.60	198.3			
May-00	256.6		382.00	245.4			
Jun-00	256.8		172.50	254.7			
Jul-00	250.9		142.10	246.0			
Aug-00	295.1		219.70	285.5			
Sep-00	283.2		354.20	276.7			
Oct-00	366.7		537.20	367.3			
Nov-00	283.2		694.20	303.4			
Dec-00	244.5	3,175.2	973.00	244.4	3,194.8		

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Keno City

Residential	Annual		MHDD	Annual		Regression Output:
	Actual / Forecast	(Whitehorse)		Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-01	275.5		724.60	335.3		
Feb-01	236.9		864.10	228.9		
Mar-01	287.5		765.30	292.4		
Apr-01	258.1		505.30	258.4		
May-01	273.7		390.40	261.0		
Jun-01	188.3		167.30	187.1		
Jul-01	290.9		139.60	286.5		
Aug-01	204.7		139.60	209.4		
Sep-01	243.3		309.00	244.8		
Oct-01	253.0		573.40	247.1		
Nov-01	236.0		818.00	234.2		
Dec-01	263.2	3,011.2	1094.60	241.6	3,026.7	
Jan-02	219.7		938.10	241.6		
Feb-02	190.7		824.60	189.7		
Mar-02	173.1		921.00	150.3		
Apr-02	199.7		653.30	173.8		
May-02	230.9		361.60	223.3		
Jun-02	210.4		175.60	207.7		
Jul-02	235.8		130.90	232.9		
Aug-02	264.6		182.80	261.5		
Sep-02	239.9		314.40	240.5		
Oct-02	250.5		444.30	267.5		
Nov-02	220.6		582.60	260.6		
Dec-02	220.4	2,656.1	845.10	243.0	2,692.3	
Jan-03	255.8		992.60	268.0		
Feb-03	204.1		756.60	215.1		
Mar-03	184.8		832.20	177.7		
Apr-03	177.4		514.30	176.1		
May-03	139.2		363.70	131.2		
Jun-03	157.2		192.80	151.5		
Jul-03	168.5		84.20	173.9		
Aug-03	167.6		180.60	165.0		
Sep-03	186.9		359.20	179.5		
Oct-03	166.7		466.70	179.8		
Nov-03	200.2		874.60	188.5		
Dec-03	239.9	2,248.3	911.60	250.7	2,257.0	
Jan-04	260.3		1254.00	226.1		
Feb-04	213.9		697.20	235.4		
Mar-04	192.9		753.50	199.8		
Apr-04	187.6		466.60	194.8		
May-04	187.6		272.50	195.9		
Jun-04	167.9		83.70	181.5		
Jul-04	156.9		74.20	164.1		
Aug-04	173.9		101.70	185.2		
Sep-04	222.1		367.50	213.3		
Oct-04	157.5		540.50	157.5		
Nov-04	274.7		719.80	290.4		
Dec-04	190.9	2,386.2	899.50	203.8	2,447.9	
Jan-05	246.3		1165.80	227.8		
Feb-05	250.9		795.20	255.1		
Mar-05	130.3		613.70	162.0		
Apr-05	114.6		453.30	124.1		
May-05	112.4		256.60	123.5		
Jun-05	119.9		154.40	121.0		
Jul-05	142.2		132.60	139.0		
Aug-05	202.8		150.80	205.5		
Sep-05	217.6		299.30	220.9		
Oct-05	156.3		534.60	157.3		
Nov-05	196.9		762.60	204.9		
Dec-05	194.9	2,085.1	794.40	226.5	2,167.5	
Jan-06	308.6		1096.20	302.4		
Feb-06	214.1		821.30	213.7		
Mar-06	296.6		906.30	276.4		
Apr-06	207.6		519.10	205.4		
May-06	165.7		346.90	160.7		
Jun-06	118.3		173.10	116.1		
Jul-06	147.0		118.40	146.3		
Aug-06	188.2		201.60	181.9		
Sep-06	223.7		295.70	227.6		
Oct-06	282.7		520.50	286.2		
Nov-06	326.8		1162.20	264.0		
Dec-06	336.9	2,816.0	824.30	363.1	2,743.8	

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Keno City

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Whitehorse)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	302.0		912.00	328.5		
Feb-07	247.6		998.80	215.6		
Mar-07	313.1		954.20	284.4		
Apr-07	233.0		486.40	236.6		
May-07	183.3		322.10	182.7		
Jun-07	159.6		140.50	163.2		
Jul-07	189.0		102.30	191.2		
Aug-07	218.2		154.20	220.3		
Sep-07	252.0		308.40	253.6		
Oct-07	327.4		543.70	326.8		
Nov-07	273.7		724.60	288.6		
Dec-07	223.0	2,921.7	1069.50	205.8	2,897.2	
Jan-08	260.6		1113.80	251.3		
Feb-08	308.0		954.60	283.9		
Mar-08	233.9		734.70	244.2		
Apr-08	304.2		517.30	302.3		
May-08	213.0		307.90	215.0		
Jun-08	144.9		225.60	133.3		
Jul-08	173.1		173.40	162.6		
Aug-08	276.2		187.70	272.3		
Sep-08	419.1		318.70	418.9		
Oct-08	397.7		563.00	393.6		
Nov-08	412.7		782.50	417.3		
Dec-08	576.5	3,719.8	1186.20	538.6	3,633.3	
Jan-09	659.7		1137.90	646.1		
Feb-09	294.6		955.40	270.4		
Mar-09	568.7		868.50	555.3		
Apr-09	323.2		515.20	321.7		
May-09	247.3		331.20	245.1		
Jun-09	177.6		144.10	180.5		
Jul-09	187.0		62.50	196.2		
Aug-09	180.5		158.30	181.8		
Sep-09	251.3		306.10	253.4		
Oct-09	295.0		541.80	294.7		
Nov-09	360.0		781.50	364.7		
Dec-09	383.5	3,928.3	955.20	386.6	3,896.5	
Jan-10	396.9		991.10	409.4		
Feb-10	332.0		679.20	356.8		
Mar-10	417.3		656.00	441.5		
Apr-10	343.6		461.20	351.7		
May-10	368.0		292.00	372.8		
Jun-10	127.7		171.90	125.7		
Jul-10	184.7		117.30	184.2		
Aug-10	200.7		146.20	204.2		
Sep-10	427.0		332.40	424.4		
Oct-10	445.7		520.40	449.2		
Nov-10	572.1		717.60	588.2		
Dec-10	574.7	4,390.5	1162.50	541.0	4,449.1	
Jan-11	588.2		1010.20	597.2		
Feb-11	431.8		905.60	416.4		
Mar-11	608.8		901.70	589.5		
Apr-11	341.7		511.20	341.0		
May-11	342.4		296.40	346.4		
Jun-11	229.4		161.00	229.4		
Jul-11	335.8		127.80	333.4		
Aug-11	140.3		217.90	131.0		
Sep-11	343.2		328.50	341.3		
Nov-11	447.1		513.30	451.9		
Nov-11	471.7		931.70	449.8		
Dec-11	640.8	4,921.1	775.10	675.8	4,903.0	
Jan-12	359.2		1118.10	349.1		
Feb-12	405.8		691.70	428.4		
Mar-12	467.3		756.20	473.7		
Apr-12	396.6		450.60	406.6		
May-12	381.9		350.80	376.3		
Jun-12	293.3		195.10	287.2		
Jul-12	198.7		140.10	194.2		
Aug-12	220.5		157.90	221.9		
Sep-12	332.3		271.00	340.5		
Oct-12	458.3		639.30	440.7		
Nov-12	566.3		969.60	537.7		
Dec-12	480.7	4,561.0	1196.80	440.9	4,497.3	

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Keno City

Residential	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)	MHDD	UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	524.3		952.00	543.7		
Feb-13	373.4		665.40	400.7		
Mar-13	472.0		851.10	461.6		
Apr-13	563.1		639.90	539.5		
May-13	327.9		294.00	332.3		
Jun-13	278.9		112.40	287.4		
Jul-13	359.9		92.50	363.8		
Aug-13	196.7		98.90	208.5		
Sep-13	280.4		264.30	289.8		
Oct-13	359.3		501.40	366.2		
Nov-13	432.8		865.60	422.6		
Dec-13	406.0	4,574.7	1144.70	375.4	4,591.7	
Jan-14	489.4		745.80	545.4		
Feb-14	449.6		992.40	418.8		
Mar-14	396.2		855.10	385.1		
Apr-14	418.8		499.80	420.1		
May-14	288.3		269.50	297.1		
Jun-14	341.8		200.50	334.7		
Jul-14	304.0		98.00	306.9		
Aug-14	288.1		144.00	292.0		
Sep-14	517.9		307.10	519.8		
Oct-14	540.8		515.60	545.2		
Nov-14	408.6		772.80	414.8		
Dec-14	504.5	4,948.0	854.40	525.5	5,005.3	
Jan-15	603.7		927.00	627.5		
Feb-15	291.3		851.40	285.5		
Mar-15	437.6		671.30	459.1		
Apr-15	119.7		453.50	129.2		
May-15	351.7		192.90	374.0		
Jun-15	120.1		127.20	126.0		
Jul-15	386.4		115.70	386.2		
Aug-15	263.5		183.20	260.4		
Sep-15	388.2		332.70	385.5		
Oct-15	377.4		469.80	389.9		
Nov-15	400.4		759.20	409.1		
Dec-15	530.9	4,270.9	947.90	535.2	4,367.8	
Jan-16	258.8		827.6	300.3		
Feb-16	499.8		688.0	523.0		
Mar-16	294.4		611.6	326.5		
Apr-16	115.7					
May-16	339.8					
Jun-16	116.0					
Jul-16	373.4					
Aug-16	254.6					
Sep-16	375.1					
Oct-16	364.7					
Nov-16	386.8					
Dec-16	513.0	3,892.0			3,988.8	
Jan-17	250.1					
Feb-17	482.9					
Mar-17	284.5					
Apr-17	111.7					
May-17	328.3					
Jun-17	112.1					
Jul-17	360.8					
Aug-17	246.0					
Sep-17	362.4					
Oct-17	352.3					
Nov-17	373.8					
Dec-17	495.6	3,760.6			3,760.6	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (4,270.9 / 4,574.7) ^ (1/2) - 1 = **-3.4%**

Note: January, February and March 2016 have been updated to include actuals.

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Stewart Crossing

Residential	Annual		MHDD	Annual		Regression Output:
	Actual / Forecast	(Whitehorse)		Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-95	547.1		1020.10	563.8		SUMMARY OUTPUT
Feb-95	468.2		840.10	459.5		Regression Statistics
Mar-95	513.5		880.00	478.0		Multiple R 0.652434872
Apr-95	438.5		439.90	465.7		R Square 0.425671262
May-95	496.3		250.70	524.0		Adjusted R Square 0.422444696
Jun-95	516.3		139.00	525.1		Standard Error 156.3329919
Jul-95	644.6		96.60	651.9		Observations 180
Aug-95	416.9		198.30	403.7		
Sep-95	484.7		226.50	521.7		ANOVA
Oct-95	450.1		524.90	456.3		
Nov-95	481.5		894.40	446.5		
Dec-95	616.9	6,074.5	1048.60	586.0	6,082.3	
Jan-96	696.5		1530.10	506.1		
Feb-96	520.6		835.80	513.7		
Mar-96	495.8		805.80	490.5		
Apr-96	392.5		526.00	384.8		
May-96	494.5		357.30	478.9		
Jun-96	444.9		193.60	431.5		
Jul-96	429.6		124.90	425.4		
Aug-96	440.5		227.30	415.6		
Sep-96	491.5		362.60	473.3		
Oct-96	563.6		679.90	506.9		
Nov-96	622.0		975.00	554.3		
Dec-96	719.9	6,312.0	1155.80	645.4	5,826.4	
Jan-97	486.7		1185.70	436.2		
Feb-97	431.4		656.50	497.3		
Mar-97	417.4		855.40	391.9		
Apr-97	422.5		484.00	431.8		
May-97	455.5		331.10	450.6		
Jun-97	380.4		148.90	385.2		
Jul-97	345.8		92.80	354.6		
Aug-97	326.6		130.00	341.2		
Sep-97	391.3		282.10	405.7		
Oct-97	374.5		641.00	333.6		
Nov-97	567.9		685.80	617.6		
Dec-97	522.7	5,122.8	762.00	608.2	5,254.0	
Jan-98	570.0		1165.70	527.6		
Feb-98	418.2		719.10	458.7		
Mar-98	376.1		756.60	390.7		
Apr-98	296.6		458.60	316.2		
May-98	387.7		270.60	407.4		
Jun-98	274.6		119.50	291.3		
Jul-98	350.9		111.60	352.1		
Aug-98	347.7		189.20	338.2		
Sep-98	343.9		327.80	339.8		
Oct-98	403.3		557.70	396.2		
Nov-98	454.9		792.30	461.3		
Dec-98	587.1	4,810.8	1051.80	554.8	4,834.3	
Jan-99	1042.8		1183.10	993.4		
Feb-99	719.2		976.40	655.2		
Mar-99	511.1		734.00	534.9		
Apr-99	510.3		508.80	509.6		
May-99	419.3		391.90	389.7		
Jun-99	373.1		153.90	375.9		
Jul-99	437.1		108.60	439.5		
Aug-99	350.7		145.70	358.9		
Sep-99	460.1		311.20	462.7		
Oct-99	364.9		499.80	381.3		
Nov-99	472.7		792.50	479.1		
Dec-99	493.0	6,154.2	844.00	545.2	6,125.1	
Jan-00	880.9		1082.90	872.1		
Feb-00	432.4		735.20	466.4		
Mar-00	421.8		659.20	476.0		
Apr-00	473.8		515.60	470.3		
May-00	336.9		382.00	311.3		
Jun-00	348.4		172.50	343.6		
Jul-00	335.1		142.10	323.8		
Aug-00	336.7		219.70	314.8		
Sep-00	495.8		354.20	480.9		
Oct-00	462.2		537.20	463.4		
Nov-00	689.6		694.20	735.9		
Dec-00	505.1	5,718.5	973.00	504.8	5,763.4	

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Stewart Crossing

Residential	Annual		MHDD	Annual		Regression Output:
	Actual / Forecast	(Whitehorse)		Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-01	589.4		724.60	726.2		
Feb-01	469.0		864.10	450.6		
Mar-01	659.6		765.30	670.7		
Apr-01	393.8		505.30	394.4		
May-01	536.3		390.40	507.3		
Jun-01	284.3		167.30	281.6		
Jul-01	302.8		139.60	292.5		
Aug-01	310.1		139.60	320.8		
Sep-01	486.2		309.00	489.7		
Oct-01	449.1		573.40	435.6		
Nov-01	749.5		818.00	745.5		
Dec-01	606.5	5,836.5	1094.60	556.8	5,871.9	
Jan-02	605.9		938.10	656.0		
Feb-02	673.7		824.60	671.3		
Mar-02	482.1		921.00	429.9		
Apr-02	531.9		653.30	472.5		
May-02	647.0		361.60	629.7		
Jun-02	482.8		175.60	476.8		
Jul-02	469.2		130.90	462.5		
Aug-02	569.3		182.80	562.4		
Sep-02	503.9		314.40	505.2		
Oct-02	667.6		444.30	706.5		
Nov-02	634.1		582.60	725.7		
Dec-02	842.2	7,109.7	845.10	893.9	7,192.6	
Jan-03	1071.7		992.60	1,099.6		
Feb-03	853.3		756.60	878.6		
Mar-03	783.2		832.20	767.1		
Apr-03	760.6		514.30	757.6		
May-03	693.5		363.70	675.4		
Jun-03	535.4		192.80	522.4		
Jul-03	700.9		84.20	713.2		
Aug-03	534.2		180.60	528.2		
Sep-03	631.7		359.20	614.8		
Oct-03	726.1		466.70	756.0		
Nov-03	708.5		874.60	681.6		
Dec-03	950.6	8,949.9	911.60	975.3	8,969.8	
Jan-04	1042.0		1254.00	963.8		
Feb-04	683.1		697.20	732.5		
Mar-04	704.9		753.50	720.7		
Apr-04	835.3		466.60	851.7		
May-04	640.5		272.50	659.4		
Jun-04	651.9		83.70	683.2		
Jul-04	729.7		74.20	746.0		
Aug-04	598.1		101.70	624.2		
Sep-04	605.6		367.50	585.3		
Oct-04	837.2		540.50	837.1		
Nov-04	850.3		719.80	886.2		
Dec-04	663.3	8,841.9	899.50	692.9	8,983.1	
Jan-05	1209.7		1165.80	1,167.3		
Feb-05	891.2		795.20	900.8		
Mar-05	716.1		613.70	788.8		
Apr-05	899.7		453.30	921.5		
May-05	598.8		256.60	624.2		
Jun-05	710.6		154.40	713.2		
Jul-05	617.4		132.60	610.0		
Aug-05	664.1		150.80	670.2		
Sep-05	731.6		299.30	739.0		
Oct-05	682.1		534.60	684.4		
Nov-05	720.3		762.60	738.8		
Dec-05	829.8	9,271.4	794.40	902.1	9,460.2	
Jan-06	1086.0		1096.20	1,071.8		
Feb-06	947.6		821.30	946.6		
Mar-06	990.6		906.30	944.4		
Apr-06	633.3		519.10	628.4		
May-06	632.4		346.90	621.1		
Jun-06	831.3		173.10	826.3		
Jul-06	561.3		118.40	559.7		
Aug-06	817.1		201.60	802.6		
Sep-06	940.9		295.70	949.8		
Oct-06	821.7		520.50	829.7		
Nov-06	888.6		1162.20	744.8		
Dec-06	1078.1	10,229.0	824.30	1,138.3	10,063.6	

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Stewart Crossing

Residential	Annual		(Whitehorse)	Annual		Regression Output:
	Actual / Forecast	UPC (kWh)		Normalized	Normalized	
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1226.9		912.00	1,287.6		
Feb-07	1030.3		998.80	957.2		
Mar-07	1290.7		954.20	1,225.0		
Apr-07	693.4		486.40	701.7		
May-07	610.3		322.10	609.0		
Jun-07	624.9		140.50	633.1		
Jul-07	540.8		102.30	545.7		
Aug-07	635.7		154.20	640.4		
Sep-07	629.6		308.40	633.4		
Oct-07	626.2		543.70	624.8		
Nov-07	783.3		724.60	817.2		
Dec-07	577.6	9,269.6	1069.50	538.2	9,213.4	
Jan-08	1085.6		1113.80	1,064.3		
Feb-08	873.3		954.60	818.2		
Mar-08	897.9		734.70	921.4		
Apr-08	422.2		517.30	418.0		
May-08	547.9		307.90	552.5		
Jun-08	532.8		225.60	506.4		
Jul-08	300.1		173.40	276.1		
Aug-08	641.3		187.70	632.4		
Sep-08	467.2		318.70	466.7		
Oct-08	707.4		563.00	698.1		
Nov-08	624.4		782.50	634.8		
Dec-08	724.4	7,824.4	1186.20	637.6	7,626.6	
Jan-09	1134.4		1137.90	1,103.3		
Feb-09	978.1		955.40	922.6		
Mar-09	671.8		868.50	641.0		
Apr-09	842.4		515.20	839.0		
May-09	542.8		331.20	537.9		
Jun-09	490.8		144.10	497.5		
Jul-09	629.7		62.50	650.8		
Aug-09	618.3		158.30	621.4		
Sep-09	641.9		306.10	646.6		
Oct-09	621.4		541.80	620.7		
Nov-09	682.3		781.50	693.2		
Dec-09	711.6	8,565.6	955.20	718.6	8,492.7	
Jan-10	1036.1		991.10	1,064.6		
Feb-10	667.3		679.20	724.0		
Mar-10	700.2		656.00	755.7		
Apr-10	662.8		461.20	681.4		
May-10	603.2		292.00	614.2		
Jun-10	412.6		171.90	408.0		
Jul-10	492.5		117.30	491.4		
Aug-10	446.1		146.20	454.1		
Sep-10	544.9		332.40	538.9		
Oct-10	312.5		520.40	320.5		
Nov-10	785.9		717.60	822.7		
Dec-10	817.3	7,481.2	1162.50	740.1	7,615.5	
Jan-11	1152.6		1010.20	1,173.3		
Feb-11	846.5		905.60	811.3		
Mar-11	845.9		901.70	801.6		
Apr-11	790.9		511.20	789.2		
May-11	880.3		296.40	889.5		
Jun-11	343.0		161.00	342.9		
Jul-11	718.4		127.80	712.9		
Aug-11	524.4		217.90	503.3		
Sep-11	602.8		328.50	598.4		
Nov-11	558.2		513.30	569.1		
Nov-11	671.0		931.70	620.9		
Dec-11	807.3	8,741.2	775.10	887.4	8,699.8	
Jan-12	1280.5		1118.10	1,257.4		
Feb-12	775.5		691.70	827.1		
Mar-12	850.3		756.20	865.1		
Apr-12	431.7		450.60	454.6		
May-12	570.4		350.80	557.5		
Jun-12	625.7		195.10	611.7		
Jul-12	466.6		140.10	456.2		
Aug-12	603.6		157.90	606.8		
Sep-12	443.1		271.00	462.1		
Oct-12	516.1		639.30	475.8		
Nov-12	1002.9		969.60	937.4		
Dec-12	1001.8	8,568.2	1196.80	910.7	8,422.4	

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Stewart Crossing

Residential	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)	MHDD	UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	1,108.1		952.00	1,152.5		
Feb-13	898.7		665.40	961.0		
Mar-13	769.3		851.10	745.5		
Apr-13	810.4		639.90	756.4		
May-13	816.5		294.00	826.7		
Jun-13	455.4		112.40	475.0		
Jul-13	513.8		92.50	522.7		
Aug-13	671.9		98.90	699.1		
Sep-13	522.9		264.30	544.6		
Oct-13	644.6		501.40	660.4		
Nov-13	612.7		865.60	589.4		
Dec-13	996.4	8,820.6	1144.70	926.5	8,859.6	
Jan-14	1,055.5		745.80	1,183.6		
Feb-14	811.3		992.40	740.8		
Mar-14	588.8		855.10	563.4		
Apr-14	610.3		499.80	613.2		
May-14	535.0		269.50	555.1		
Jun-14	508.8		200.50	492.6		
Jul-14	531.8		98.00	538.5		
Aug-14	445.0		144.00	453.9		
Sep-14	520.8		307.10	525.1		
Oct-14	627.4		515.60	637.4		
Nov-14	624.1		772.80	638.5		
Dec-14	888.4	7,747.0	854.40	936.3	7,878.3	
Jan-15	801.1		927.00	855.7		
Feb-15	825.2		851.40	811.9		
Mar-15	787.0		671.30	836.3		
Apr-15	682.5		453.50	704.3		
May-15	851.8		192.90	903.0		
Jun-15	66.1		127.20	79.7		
Jul-15	562.3		115.70	561.8		
Aug-15	498.7		183.20	491.7		
Sep-15	528.3		332.70	522.1		
Oct-15	667.3		469.80	695.9		
Nov-15	679.1		759.20	699.0		
Dec-15	965.9	7,915.2	947.90	975.8	8,137.2	
Jan-16	714.4		827.6	809.3		
Feb-16	673.4		688.0	726.6		
Mar-16	552.0		611.6	625.5		
Apr-16	646.6					
May-16	806.9					
Jun-16	62.6					
Jul-16	532.6					
Aug-16	472.4					
Sep-16	500.4					
Oct-16	632.1					
Nov-16	643.3					
Dec-16	914.9	7,151.7			7,373.3	
Jan-17	676.7					
Feb-17	637.9					
Mar-17	522.9					
Apr-17	612.5					
May-17	764.4					
Jun-17	59.3					
Jul-17	504.6					
Aug-17	447.5					
Sep-17	474.0					
Oct-17	598.8					
Nov-17	609.4					
Dec-17	866.7	6,774.7			6,774.7	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (7,915.2 / 8,820.6) ^ (1/2) - 1 = **-5.3%**

Note: January, February and March 2016 have been updated to include actuals.

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Swift River

Residential	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake)	MHDD	UPC (kWh)	UPC (kWh)	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-95	1651.3		938.70	1786.3		SUMMARY OUTPUT
Feb-95	1281.7		941.90	1298.4		
Mar-95	1646.0		855.60	1661.8		Regression Statistics
Apr-95	711.7		492.70	736.5		Multiple R 0.541926889
May-95	922.0		242.50	954.6		R Square 0.293684753
Jun-95	972.7		97.00	991.1		Adjusted R Square 0.28971669
Jul-95	761.7		113.00	752.4		Standard Error 276.0643715
Aug-95	853.0		189.90	835.6		Observations 180
Sep-95	1074.0		224.90	1109.5		
Oct-95	938.0		552.70	941.4		ANOVA
Nov-95	1358.7		1000.20	1340.3		
Dec-95	1360.0	13,530.7	1295.40	1312.6	13,720.5	
Jan-96	1602.0		1605.20	1447.1		
Feb-96	1255.7		947.30	1270.0		
Mar-96	1325.7		874.30	1333.3		
Apr-96	1164.3		547.70	1165.3		
May-96	942.0		366.40	920.7		
Jun-96	892.3		163.90	881.7		
Jul-96	817.0		103.30	812.0		
Aug-96	820.0		185.10	804.6		
Sep-96	920.3		354.70	899.4		
Oct-96	988.7		662.20	944.5		
Nov-96	879.0		1121.20	808.1		
Dec-96	2205.3	13,812.3	1361.10	2129.3	13,416.0	
Jan-97	2185.7		1406.60	2117.1		
Feb-97	1455.0		884.80	1496.5		
Mar-97	1260.7		943.90	1238.0		
Apr-97	803.0		527.90	812.5		
May-97	1296.3		311.80	1298.8		
Jun-97	633.0		142.60	631.6		
Jul-97	836.7		84.10	840.0		
Aug-97	814.0		109.60	831.5		
Sep-97	831.0		271.10	846.4		
Oct-97	787.3		659.70	744.2		
Nov-97	1126.7		935.80	1136.4		
Dec-97	963.0	12,992.3	983.70	1051.1	13,044.2	
Jan-98	1148.3		1409.70	1078.4		
Feb-98	1390.7		942.00	1407.3		
Mar-98	1251.0		843.40	1272.1		
Apr-98	1103.7		500.10	1125.3		
May-98	945.7		211.00	992.0		
Jun-98	861.0		89.00	882.9		
Jul-98	625.7		65.70	637.0		
Aug-98	1008.3		156.80	1005.3		
Sep-98	1095.0		320.70	1088.9		
Oct-98	935.3		561.20	935.1		
Nov-98	1137.0		958.10	1137.0		
Dec-98	931.7	12,433.3	1252.70	902.8	12,464.0	
Jan-99	974.7		1350.20	930.7		
Feb-99	2270.3		1066.40	2232.9		
Mar-99	1260.7		871.40	1269.6		
Apr-99	970.3		506.40	989.2		
May-99	1263.0		372.20	1239.2		
Jun-99	830.0		140.20	829.7		
Jul-99	897.0		99.40	893.7		
Aug-99	817.0		127.80	826.6		
Sep-99	989.7		292.50	995.8		
Oct-99	1007.7		519.80	1025.4		
Nov-99	1168.3		939.90	1176.2		
Dec-99	1039.7	13,488.3	1013.00	1115.0	13,523.9	
Jan-00	1437.7		1344.80	1396.0		
Feb-00	1334.0		956.00	1344.6		
Mar-00	1228.3		750.10	1290.0		
Apr-00	1005.3		590.90	987.5		
May-00	1066.7		373.80	1042.2		
Jun-00	909.7		158.00	901.6		
Jul-00	840.0		84.30	843.2		
Aug-00	979.7		216.90	950.5		
Sep-00	857.7		314.80	854.1		
Oct-00	1044.7		575.80	1038.1		
Nov-00	1111.3		858.40	1154.7		
Dec-00	1285.3	13,100.3	1222.80	1269.5	13,071.8	

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Swift River

Residential	Annual		(Watson Lake)	Annual		Regression Output:
	Actual / Forecast	UPC (kWh)		Normalized	Normalized	
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)	
Jan-01	1344.7		1043.40	1434.1		
Feb-01	1051.7		1031.00	1029.6		
Mar-01	1105.0		844.90	1125.4		
Apr-01	1138.3		535.80	1144.4		
May-01	995.3		366.60	974.0		
Jun-01	852.7		155.50	845.7		
Jul-01	910.0		120.30	897.6		
Aug-01	1008.7		120.60	1021.4		
Sep-01	997.3		299.60	1000.4		
Oct-01	1231.3		577.00	1224.2		
Nov-01	1093.3		975.00	1086.0		
Dec-01	1126.3	12,854.7	1275.40	1087.6	12,870.3	
Jan-02	1300.3		1246.30	1301.5		
Feb-02	1052.0		970.30	1056.3		
Mar-02	1169.7		991.60	1126.3		
Apr-02	1142.0		694.80	1078.9		
May-02	1029.3		365.90	1008.3		
Jun-02	810.7		147.80	807.0		
Jul-02	878.7		121.60	865.7		
Aug-02	1053.7		181.50	1039.9		
Sep-02	1013.7		331.00	1003.1		
Oct-02	1040.0		514.80	1059.9		
Nov-02	1074.7		821.90	1133.9		
Dec-02	1034.0	12,598.7	1117.90	1063.8	12,544.6	
Jan-03	1562.0		1177.50	1593.1		
Feb-03	1149.7		964.70	1156.5		
Mar-03	1183.3		899.50	1180.0		
Apr-03	1727.3		554.40	1725.3		
May-03	1079.3		341.60	1068.8		
Jun-03	940.0		179.90	922.4		
Jul-03	713.3		56.60	728.6		
Aug-03	995.3		163.00	989.6		
Sep-03	979.0		330.20	968.7		
Oct-03	1003.7		526.10	1018.7		
Nov-03	1087.0		963.90	1084.5		
Dec-03	1379.7	13,799.7	1095.50	1419.2	13,855.4	
Jan-04	1503.0		1365.60	1452.3		
Feb-04	1325.3		881.20	1368.4		
Mar-04	660.3		809.90	696.0		
Apr-04	1102.7		497.40	1125.5		
May-04	915.0		292.30	925.9		
Jun-04	964.7		74.10	993.1		
Jul-04	938.3		35.60	962.7		
Aug-04	936.3		145.70	938.1		
Sep-04	970.7		370.70	942.8		
Oct-04	1082.7		565.00	1080.8		
Nov-04	1215.0		875.50	1250.9		
Dec-04	1083.0	12,697.0	1070.70	1133.3	12,869.8	
Jan-05	1430.7		1330.30	1395.3		
Feb-05	1177.3		941.80	1194.1		
Mar-05	891.7		726.90	963.4		
Apr-05	991.7		464.80	1028.6		
May-05	659.3		256.90	685.7		
Jun-05	1585.0		126.60	1590.6		
Jul-05	904.7		136.90	885.0		
Aug-05	932.7		162.20	927.3		
Sep-05	894.0		297.30	898.1		
Oct-05	1050.7		541.70	1058.9		
Nov-05	1142.3		758.40	1229.2		
Dec-05	1240.0	12,900.0	1061.00	1294.5	13,150.6	
Jan-06	1113.3		1185.20	1141.1		
Feb-06	1596.3		1016.70	1580.5		
Mar-06	1869.7		960.50	1839.8		
Apr-06	1351.7		528.20	1361.1		
May-06	1412.7		371.10	1389.3		
Jun-06	979.0		136.50	980.3		
Jul-06	871.0		79.20	876.4		
Aug-06	911.7		171.70	902.1		
Sep-06	1007.3		292.40	1013.5		
Oct-06	1077.0		543.30	1084.5		
Nov-06	1236.0		1196.20	1132.4		
Dec-06	1497.7	14,923.3	1050.00	1557.0	14,858.1	

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Swift River

Residential	Annual			Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized		
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-07	1829.7		1102.40	1893.4		
Feb-07	1563.7		1017.30	1547.6		
Mar-07	1426.0		1001.90	1378.1		
Apr-07	1210.0		543.00	1213.0		
May-07	1262.3		332.20	1255.9		
Jun-07	1116.0		122.60	1123.3		
Jul-07	1491.7		88.60	1493.0		
Aug-07	639.7		143.10	642.6		
Sep-07	879.3		314.70	875.8		
Oct-07	979.3		553.10	982.6		
Nov-07	1180.0		956.60	1180.6		
Dec-07	1136.0	14,713.7	1255.10	1106.1	14,692.1	
Jan-08	1438.7		1300.10	1416.4		
Feb-08	1381.3		1064.20	1344.8		
Mar-08	1053.3		833.30	1078.8		
Apr-08	1539.0		554.00	1537.2		
May-08	666.7		295.60	676.2		
Jun-08	711.0		191.00	688.6		
Jul-08	798.3		131.50	781.0		
Aug-08	711.7		154.00	709.8		
Sep-08	791.7		304.20	792.7		
Oct-08	851.7		523.50	867.8		
Nov-08	1001.7		882.50	1034.5		
Dec-08	1205.3	12,150.3	1386.50	1118.3	12,046.2	
Jan-09	1811.7		1329.30	1776.7		
Feb-09	1290.3		1089.50	1242.8		
Mar-09	1636.3		1054.20	1565.7		
Apr-09	1408.0		590.00	1390.5		
May-09	1376.0		356.00	1359.2		
Jun-09	1203.3		131.20	1206.9		
Jul-09	1127.7		89.00	1128.8		
Aug-09	1108.0		134.40	1114.7		
Sep-09	1143.3		279.40	1155.2		
Oct-09	820.0		606.90	799.9		
Nov-09	820.0		996.50	803.3		
Dec-09	833.3	14,578.0	1340.70	766.2	14,310.0	
Jan-10	1014.5		1219.70	1027.2		
Feb-10	860.0		965.80	866.3		
Mar-10	809.5		763.50	865.3		
Apr-10	780.0		502.70	800.5		
May-10	464.3		277.70	481.5		
Jun-10	309.5		142.70	308.1		
Jul-10	123.0		70.80	132.1		
Aug-10	525.0		119.60	538.1		
Sep-10	567.0		316.80	562.6		
Oct-10	451.5		501.80	477.1		
Nov-10	1050.0		904.20	1073.4		
Dec-10	1556.5	8,510.8	1292.10	1510.5	8,642.8	
Jan-11	1613.0		1201.00	1633.9		
Feb-11	1036.0		1004.60	1025.4		
Mar-11	1043.5		1032.90	982.2		
Apr-11	1853.5		587.50	1837.1		
May-11	751.0		271.10	771.2		
Jun-11	564.5		143.10	562.9		
Jul-11	530.5		104.40	525.0		
Aug-11	654.5		195.10	634.8		
Sep-11	640.5		292.40	646.7		
Nov-11	833.0		511.90	854.2		
Nov-11	1137.5		1059.10	1093.6		
Dec-11	1126.0	11,783.5	1006.30	1204.3	11,771.1	
Jan-12	1425.5		1273.00	1415.1		
Feb-12	1153.5		935.50	1173.0		
Mar-12	1031.0		909.00	1023.5		
Apr-12	1014.0		512.60	1030.2		
May-12	434.8		340.20	424.9		
Jun-12	434.8		149.70	430.3		
Jul-12	743.5		77.80	749.5		
Aug-12	774.0		134.00	780.9		
Sep-12	804.0		278.80	816.1		
Oct-12	671.5		714.50	604.6		
Nov-12	1030.5		1112.80	963.2		
Dec-12	892.5	10,409.5	1356.20	818.6	10,229.8	

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Swift River

Residential	Annual		Annual		Regression Output:
	Actual / Forecast	(Watson Lake)	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)
Jan-13	1,464.5		1129.10	1,516.6	
Feb-13	864.5		765.80	957.8	
Mar-13	852.0		950.70	826.4	
Apr-13	906.5		690.10	845.5	
May-13	1,411.5		304.50	1,417.1	
Jun-13	790.5		96.30	809.3	
Jul-13	809.0		105.10	803.2	
Aug-13	816.0		82.20	845.4	
Sep-13	669.5		239.10	698.9	
Oct-13	718.0		490.20	748.6	
Nov-13	1,216.0		1021.30	1,188.5	
Dec-13	1,679.5	12,197.5	1248.80	1,652.3	12,309.6
Jan-14	1,227.0		937.70	1,362.4	
Feb-14	1,872.5		1204.40	1,775.0	
Mar-14	1,229.5		1008.90	1,178.6	
Apr-14	1,107.5		570.50	1,098.5	
May-14	797.0		331.08	791.1	
Jun-14	740.5		186.80	719.9	
Jul-14	567.5		87.60	569.3	
Aug-14	841.0		144.80	843.2	
Sep-14	438.0		295.80	442.7	
Oct-14	611.5		539.70	620.6	
Nov-14	712.0		936.40	721.4	
Dec-14	963.0	11,107.0	1176.70	967.2	11,089.9
Jan-15	1,125.5		1022.80	1,223.9	
Feb-15	787.0		956.70	797.3	
Mar-15	724.5		766.30	779.1	
Apr-15	576.5		497.40	599.3	
May-15	635.5		210.80	681.9	
Jun-15	553.5		111.80	565.5	
Jul-15	545.0		92.40	544.7	
Aug-15	531.0		147.50	532.0	
Sep-15	657.0		336.10	644.2	
Oct-15	587.0		523.70	603.0	
Nov-15	748.0		887.80	778.6	
Dec-15	871.0	8,341.5	1160.30	882.3	8,631.7
Jan-16	1,323.5		1,099.3	1,388.6	2 year Compound Annual Growth Rate = = (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) -1 = = (8,341.5 / 12,197.5) ^ (1/2) - 1 = -17.3%
Feb-16	1,090.5		930.8	1,112.0	
Mar-16	811.0		724.3	883.9	
Apr-16	476.7				
May-16	525.5				
Jun-16	457.7				
Jul-16	450.7				
Aug-16	439.1				
Sep-16	543.3				
Oct-16	485.4				
Nov-16	618.6				
Dec-16	720.3	7,942.4		8,101.9	
Jan-17	1,094.5				
Feb-17	901.8				
Mar-17	670.7				
Apr-17	394.3				
May-17	434.6				
Jun-17	378.5				
Jul-17	372.7				
Aug-17	363.1				
Sep-17	449.3				
Oct-17	401.4				
Nov-17	511.5				
Dec-17	595.7	6,568.1		6,568.1	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (8,341.5 / 12,197.5) ^ (1/2) - 1 = **-17.3%**

Note: January, February and March 2016 have been updated to include actuals.

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Whitehorse

Heating Degree Day (HDD)

Degree Days Below 18.0 °C

MONTH	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	"Normal" HDD (1995-2015)
JAN	1020.1	1530.1	1185.7	1165.7	1183.1	1082.9	724.6	938.1	992.6	1254	1165.8	1096.2	912	1113.8	1137.9	991.1	1010.2	1118.1	952.0	745.8	927.0	1,061.3
FEB	840.1	835.8	656.5	719.1	976.4	735.2	864.1	824.6	756.6	697.2	795.2	821.3	998.8	954.6	955.4	679.2	905.6	691.7	665.4	992.4	851.4	818.8
MAR	880	805.8	855.4	756.6	734	659.2	765.3	921	832.2	753.5	613.7	906.3	954.2	734.7	868.5	656	901.7	756.2	851.1	855.1	671.3	792.6
APR	439.9	526	484	458.6	508.8	515.6	505.3	653.3	514.3	466.6	453.3	519.1	486.4	517.3	515.2	461.2	511.2	450.6	639.9	499.8	453.5	507.0
MAY	250.7	357.3	331.1	270.6	391.9	382	390.4	361.6	363.7	272.5	256.6	346.9	322.1	307.9	331.2	292	296.4	350.8	294.0	269.5	192.9	319.1
JUN	139	193.6	148.9	119.5	153.9	172.5	167.3	175.6	192.8	83.7	154.4	173.1	140.5	225.6	144.1	171.9	161	195.1	112.4	200.5	127.2	160.7
JUL	96.6	124.9	92.8	111.6	108.6	142.1	139.6	130.9	84.2	74.2	132.6	118.4	102.3	173.4	62.5	117.3	127.8	140.1	92.5	98.0	115.7	114.5
AUG	198.3	227.3	130	189.2	145.7	219.7	139.6	182.8	180.6	101.7	150.8	201.6	154.2	187.7	158.3	146.2	217.9	157.9	98.9	144.0	183.2	165.9
SEP	226.5	362.6	282.1	327.8	311.2	354.2	309	314.4	359.2	367.5	299.3	295.7	308.4	318.7	306.1	332.4	328.5	271	264.3	307.1	332.7	317.6
OCT	524.9	679.9	641	557.7	499.8	537.2	573.4	444.3	466.7	540.5	534.6	520.5	543.7	563	541.8	520.4	513.3	639.3	501.4	515.6	469.8	540.2
NOV	894.4	975	685.8	792.3	792.5	694.2	818	582.6	874.6	719.8	762.6	1162.2	724.6	782.5	781.5	717.6	931.7	969.6	865.6	772.8	759.2	808.2
DEC	1048.6	1155.8	762	1051.8	844	973	1094.6	845.1	911.6	899.5	794.4	824.3	1069.5	1186.2	955.2	1162.5	775.1	1196.8	1,144.7	854.4	947.9	972.4
TOTAL	6559.1	7774.1	6255.3	6520.5	6649.9	6467.8	6491.2	6374.3	6529.1	6230.7	6113.3	6985.6	6716.7	7065.4	6757.7	6247.8	6680.4	6937.2	6,482.2	6,255.0	6,031.8	6,578.3

Watson Lake

Heating Degree Day (HDD)

Degree Days Below 18.0 °C

MONTH	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	"Normal" HDD (1995-2015)
JAN	938.7	1605.2	1406.6	1409.7	1350.2	1344.8	1043.4	1246.3	1177.5	1365.6	1330.3	1185.2	1102.4	1300.1	1329.3	1219.7	1201	1273	1,129.1	937.7	1,022.8	1,249.0
FEB	941.9	947.3	884.8	942	1066.4	956	1031	970.3	964.7	881.2	941.8	1016.7	1017.3	1064.2	1089.5	965.8	1004.6	935.5	765.8	1,204.4	956.7	980.3
MAR	855.6	874.3	943.9	843.4	871.4	750.1	844.9	991.6	899.5	809.9	726.9	960.5	1001.9	833.3	1054.2	763.5	1032.9	909	950.7	1,008.9	766.3	891.9
APR	492.7	547.7	527.9	500.1	506.4	590.9	535.8	694.8	554.4	497.4	464.8	528.2	543	554	590	502.7	587.5	512.6	690.1	570.5	497.4	549.8
MAY	242.5	366.4	311.8	211	372.2	373.8	366.6	365.9	341.6	292.3	256.9	371.1	332.2	295.6	356	277.7	271.1	340.2	304.5	331.1	210.8	317.4
JUN	97	163.9	142.6	89	140.2	158	155.5	147.8	179.9	74.1	126.6	136.5	122.6	191	131.2	142.7	143.1	149.7	96.3	186.8	111.8	139.5
JUL	113	103.3	84.1	65.7	99.4	84.3	120.3	121.6	56.6	35.6	136.9	79.2	88.6	131.5	89	70.8	104.4	77.8	105.1	87.6	92.4	91.7
AUG	189.9	185.1	109.6	156.8	127.8	216.9	120.6	181.5	163	145.7	162.2	171.7	143.1	154	134.4	119.6	195.1	134	82.2	144.8	147.5	149.8
SEP	224.9	354.7	271.1	320.7	292.5	314.8	299.6	331	330.2	370.7	297.3	292.4	314.7	304.2	279.4	316.8	292.4	278.8	239.1	295.8	336.1	306.6
OCT	552.7	662.2	659.7	561.2	519.8	575.8	577	514.8	526.1	565	541.7	543.3	553.1	523.5	606.9	501.8	511.9	714.5	490.2	539.7	523.7	560.6
NOV	1000.2	1121.2	935.8	958.1	939.9	858.4	975	821.9	963.9	875.5	758.4	1196.2	956.6	882.5	996.5	904.2	1059.1	1112.8	1,021.3	936.4	887.8	958.1
DEC	1295.4	1361.1	983.7	1252.7	1013	1222.8	1275.4	1117.9	1095.5	1070.7	1061	1050	1255.1	1386.5	1340.7	1292.1	1006.3	1356.2	1,248.8	1,176.7	1,160.3	1,186.3
TOTAL	6944.5	8292.4	7261.6	7310.4	7299.2	7446.6	7345.1	7505.4	7252.9	6983.7	6804.8	7531	7430.6	7620.4	7997.1	7077.4	7409.4	7794.1	7,123.2	7,420.4	6,713.6	7,381.0

ATCO Electric Yukon
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Whitehorse (Includes Takhini & Deep Creek)

Annual		Annual																																																						
Commercial	Actual / Forecast	(Whitehorse)	Normalized	Normalized																																																				
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)																																																				
Jan-95	6461.1		1020.1	6,523.9																																																				
Feb-95	5710.4		840.1	5,678.0																																																				
Mar-95	6048.4		880.0	5,915.2																																																				
Apr-95	5345.2		439.9	5,447.5																																																				
May-95	4988.3		250.7	5,092.5																																																				
Jun-95	4816.7		139.0	4,849.7																																																				
Jul-95	4726.0		96.6	4,753.2																																																				
Aug-95	4705.4		198.3	4,656.0																																																				
Sep-95	4702.5		226.5	4,841.3																																																				
Oct-95	4870.5		524.9	4,893.8																																																				
Nov-95	5531.3		894.4	5,400.0																																																				
Dec-95	6051.9	63,957.6	1048.6	5,935.8	63,986.8																																																			
Jan-96	6773.6		1530.1	6,059.5	Regression Output: SUMMARY OUTPUT Regression Statistics Multiple R0.777418536 R Square0.60437958 Adjusted R Square0.602156993 Standard Error408.4185065 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>45358836.95</td><td>45358836.95</td><td>271.9262193</td><td>1.10079E-37</td></tr><tr><td>Residual</td><td>178</td><td>29691410.4</td><td>166805.6764</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>75050247.35</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>4643.279683</td><td>58.74074678</td><td>79.04699782</td><td>1.4462E-140</td><td>4527.361816</td><td>4759.19755</td><td>4527.361816</td><td>4759.19755</td></tr><tr><td>WH-HDD</td><td>1.523168514</td><td>0.092368185</td><td>16.49018554</td><td>1.10079E-37</td><td>1.340890902</td><td>1.705446126</td><td>1.340890902</td><td>1.705446126</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	45358836.95	45358836.95	271.9262193	1.10079E-37	Residual	178	29691410.4	166805.6764			Total	179	75050247.35					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	4643.279683	58.74074678	79.04699782	1.4462E-140	4527.361816	4759.19755	4527.361816	4759.19755	WH-HDD	1.523168514	0.092368185	16.49018554	1.10079E-37	1.340890902	1.705446126	1.340890902	1.705446126
	df	SS	MS	F		Significance F																																																		
Regression	1	45358836.95	45358836.95	271.9262193		1.10079E-37																																																		
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	4643.279683	58.74074678	79.04699782	1.4462E-140		4527.361816	4759.19755	4527.361816	4759.19755																																															
WH-HDD	1.523168514	0.092368185	16.49018554	1.10079E-37		1.340890902	1.705446126	1.340890902	1.705446126																																															
Feb-96	6462.3		835.8	6,436.4																																																				
Mar-96	6062.1		805.8	6,042.0																																																				
Apr-96	5546.5		526.0	5,517.5																																																				
May-96	4952.6		357.3	4,894.3																																																				
Jun-96	4887.7		193.6	4,837.5																																																				
Jul-96	4792.2		124.9	4,776.3																																																				
Aug-96	4754.2		227.3	4,660.6																																																				
Sep-96	4820.4		362.6	4,751.9																																																				
Oct-96	5085.5		679.9	4,872.7																																																				
Nov-96	5831.3		975.0	5,577.3																																																				
Dec-96	6002.1	65,970.3	1155.8	5,722.8	64,148.9																																																			
Jan-97	7165.3		1185.7	6,975.9																																																				
Feb-97	5940.1		656.5	6,187.3																																																				
Mar-97	5576.2		855.4	5,480.5																																																				
Apr-97	5688.0		484.0	5,723.0																																																				
May-97	4805.8		331.1	4,787.5																																																				
Jun-97	4894.7		148.9	4,912.6																																																				
Jul-97	4859.0		92.8	4,892.0																																																				
Aug-97	4648.6		130.0	4,703.3																																																				
Sep-97	4726.5		282.1	4,780.6																																																				
Oct-97	5013.0		641.0	4,859.4																																																				
Nov-97	5401.2		685.8	5,587.7																																																				
Dec-97	5303.5	64,021.8	762.0	5,624.0		64,513.8																																																		
Jan-98	6505.6		1165.7	6,346.6																																																				
Feb-98	5634.0		719.1	5,785.9																																																				
Mar-98	5693.8		756.6	5,748.6																																																				
Apr-98	5163.2		458.6	5,237.0																																																				
May-98	4586.5		270.6	4,660.3																																																				
Jun-98	4652.9		119.5	4,715.6																																																				
Jul-98	5010.2		111.6	5,014.6																																																				
Aug-98	4582.0		189.2	4,546.5																																																				
Sep-98	4955.0		327.8	4,939.5																																																				
Oct-98	4829.4		557.7	4,802.8																																																				
Nov-98	5338.7		792.3	5,362.9																																																				
Dec-98	5396.1	62,347.5	1051.8	5,275.2		62,435.5																																																		
Jan-99	6310.0		1183.1	6,124.5																																																				
Feb-99	5780.9		976.4	5,540.9																																																				
Mar-99	5635.1		734.0	5,724.4																																																				
Apr-99	5328.9		508.8	5,326.2																																																				
May-99	4618.1		391.9	4,507.1																																																				
Jun-99	4949.9		153.9	4,960.2																																																				
Jul-99	4691.0		108.6	4,700.0																																																				
Aug-99	4812.3		145.7	4,843.0																																																				
Sep-99	4775.5		311.2	4,785.2																																																				
Oct-99	4765.6		499.8	4,827.2																																																				
Nov-99	5699.1		792.5	5,723.0																																																				
Dec-99	5408.6	62,774.9	844.0	5,604.2		62,665.9																																																		
Jan-00	6270.0		1082.9	6,237.2																																																				
Feb-00	5618.3		735.2	5,745.7																																																				
Mar-00	5373.1		659.2	5,576.3																																																				
Apr-00	5135.7		515.6	5,122.6																																																				
May-00	4908.8		382.0	4,812.9																																																				
Jun-00	5034.0		172.5	5,016.0																																																				
Jul-00	5237.4		142.1	5,195.4																																																				
Aug-00	4597.9		219.7	4,515.9																																																				
Sep-00	4688.6		354.2	4,632.9																																																				
Oct-00	5074.6		537.2	5,079.2																																																				
Nov-00	5163.4		694.2	5,337.1																																																				
Dec-00	5332.6	62,434.6	973.0	5,331.7		62,602.9																																																		

ATCO Electric Yukon
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Whitehorse (Includes Takhini & Deep Creek)

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	6238.6		724.6	6,751.5		
Feb-01	5372.8		864.1	5,303.8		
Mar-01	5575.1		765.3	5,616.7		
Apr-01	5254.6		505.3	5,257.2		
May-01	4872.9		390.4	4,764.2		
Jun-01	5065.5		167.3	5,055.4		
Jul-01	4856.0		139.6	4,817.7		
Aug-01	4687.7		139.6	4,727.7		
Sep-01	4700.3		309.0	4,713.4		
Oct-01	4776.3		573.4	4,725.7		
Nov-01	5160.6		818.0	5,145.8		
Dec-01	6068.1	62,628.5	1094.6	5,882.0	62,761.1	
Jan-02	6625.4		938.1	6,813.1		
Feb-02	5647.2		824.6	5,638.4		
Mar-02	5652.4		921.0	5,456.8		
Apr-02	5820.4		653.3	5,597.6		
May-02	4986.7		361.6	4,922.0		
Jun-02	4977.1		175.6	4,954.4		
Jul-02	4830.6		130.9	4,805.6		
Aug-02	5114.3		182.8	5,088.5		
Sep-02	4691.5		314.4	4,696.3		
Oct-02	4775.7		444.3	4,921.8		
Nov-02	5341.5		582.6	5,685.2		
Dec-02	5248.7	63,711.5	845.1	5,442.6	64,022.2	
Jan-03	6118.1		992.6	6,222.8		
Feb-03	5469.9		756.6	5,564.7		
Mar-03	5558.0		832.2	5,497.7		
Apr-03	5635.0		514.3	5,623.9		
May-03	4796.2		363.7	4,728.2		
Jun-03	5193.2		192.8	5,144.3		
Jul-03	4871.7		84.2	4,917.8		
Aug-03	4826.9		180.6	4,804.5		
Sep-03	4977.7		359.2	4,914.4		
Oct-03	4908.9		466.7	5,020.8		
Nov-03	5710.2		874.6	5,609.1		
Dec-03	6030.7	64,096.6	911.6	6,123.3	64,171.6	
Jan-04	6327.7		1254.0	6,034.3		
Feb-04	5884.6		697.2	6,069.8		
Mar-04	5719.5		753.5	5,779.0		
Apr-04	5675.5		466.6	5,737.0		
May-04	4919.0		272.5	4,989.9		
Jun-04	5256.3		83.7	5,373.6		
Jul-04	5382.1		74.2	5,443.5		
Aug-04	5193.3		101.7	5,291.0		
Sep-04	4966.8		367.5	4,890.9		
Oct-04	4899.0		540.5	4,898.5		
Nov-04	5547.9		719.8	5,682.6		
Dec-04	5925.4	65,697.2	899.5	6,036.5	66,226.6	
Jan-05	6542.3		1165.8	6,383.2		
Feb-05	5831.6		795.2	5,867.6		
Mar-05	5576.4		613.7	5,848.9		
Apr-05	5447.0		453.3	5,528.8		
May-05	5221.6		256.6	5,316.8		
Jun-05	4916.0		154.4	4,925.6		
Jul-05	5069.1		132.6	5,041.5		
Aug-05	5037.7		150.8	5,060.6		
Sep-05	5104.8		299.3	5,132.7		
Oct-05	5019.0		534.6	5,027.5		
Nov-05	5822.2		762.6	5,891.7		
Dec-05	5692.6	65,280.3	794.4	5,963.7	65,988.6	
Jan-06	6640.3		1096.2	6,587.2		
Feb-06	5769.7		821.3	5,765.9		
Mar-06	6392.0		906.3	6,218.8		
Apr-06	5954.7		519.1	5,936.3		
May-06	4756.8		346.9	4,714.4		
Jun-06	5281.1		173.1	5,262.2		
Jul-06	5281.8		118.4	5,275.9		
Aug-06	5003.7		201.6	4,949.3		
Sep-06	5003.2		295.7	5,036.6		
Oct-06	5291.9		520.5	5,321.9		
Nov-06	5713.1		1162.2	5,174.0		
Dec-06	6170.1	67,258.6	824.3	6,395.7	66,638.2	

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Attachment 20

Whitehorse (Includes Takhini & Deep Creek)

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	6812.0		912.0	7,039.5		
Feb-07	6292.5		998.8	6,018.4		
Mar-07	6661.4		954.2	6,415.3		
Apr-07	6027.1		486.4	6,058.5		
May-07	5031.5		322.1	5,026.8		
Jun-07	5124.8		140.5	5,155.6		
Jul-07	5513.1		102.3	5,531.6		
Aug-07	4946.4		154.2	4,964.2		
Sep-07	5033.8		308.4	5,047.8		
Oct-07	4986.0		543.7	4,980.6		
Nov-07	5808.4		724.6	5,935.7		
Dec-07	5860.3	68,097.4	1069.5	5,712.4	67,886.6	
Jan-08	6893.6		1113.8	6,813.7		
Feb-08	6595.9		954.6	6,389.1		
Mar-08	5835.6		734.7	5,923.8		
Apr-08	6118.8		517.3	6,103.1		
May-08	4992.0		307.9	5,009.0		
Jun-08	5005.9		225.6	4,907.0		
Jul-08	4786.3		173.4	4,696.5		
Aug-08	5495.8		187.7	5,462.5		
Sep-08	4956.2		318.7	4,954.5		
Oct-08	4954.2		563.0	4,919.5		
Nov-08	6090.2		782.5	6,129.4		
Dec-08	5794.8	67,519.3	1186.2	5,469.2	66,777.4	
Jan-09	7565.7		1137.9	7,449.1		
Feb-09	5988.0		955.4	5,780.0		
Mar-09	6292.7		868.5	6,177.0		
Apr-09	5845.1		515.2	5,832.6		
May-09	5027.2		331.2	5,008.7		
Jun-09	4869.4		144.1	4,894.6		
Jul-09	5331.7		62.5	5,410.9		
Aug-09	5039.5		158.3	5,051.1		
Sep-09	4763.2		306.1	4,780.8		
Oct-09	4916.5		541.8	4,914.1		
Nov-09	5669.2		781.5	5,709.9		
Dec-09	5607.1	66,915.3	955.2	5,633.3	66,642.1	
Jan-10	6869.4		991.1	6,976.4		
Feb-10	5789.1		679.2	6,001.8		
Mar-10	5691.0		656.0	5,899.1		
Apr-10	5849.5		461.2	5,919.2		
May-10	5063.1		292.0	5,104.3		
Jun-10	5070.4		171.9	5,053.3		
Jul-10	4881.0		117.3	4,876.7		
Aug-10	4922.3		146.2	4,952.3		
Sep-10	4998.4		332.4	4,975.8		
Oct-10	5083.6		520.4	5,113.8		
Nov-10	5768.6		717.6	5,906.7		
Dec-10	5897.7	65,884.1	1162.5	5,608.1	66,387.5	
Jan-11	7313.0		1010.2	7,390.9		
Feb-11	5882.6		905.6	5,750.4		
Mar-11	6634.5		901.7	6,468.3		
Apr-11	5635.1		511.2	5,628.7		
May-11	5375.0		296.4	5,409.5		
Jun-11	5020.7		161.0	5,020.2		
Jul-11	4930.7		127.8	4,910.4		
Aug-11	4863.1		217.9	4,783.9		
Sep-11	5015.5		328.5	4,999.0		
Nov-11	5219.9		513.3	5,260.9		
Nov-11	5620.1		931.7	5,432.0		
Dec-11	6052.7	67,563.0	775.1	6,353.2	67,407.5	
Jan-12	7283.9		1118.1	7,197.5		
Feb-12	6083.3		691.7	6,276.9		
Mar-12	5987.1		756.2	6,042.5		
Apr-12	5943.4		450.6	6,029.3		
May-12	5346.6		350.8	5,298.3		
Jun-12	5059.4		195.1	5,007.0		
Jul-12	4952.2		140.1	4,913.1		
Aug-12	4804.0		157.9	4,816.1		
Sep-12	4622.5		271.0	4,693.5		
Oct-12	5237.7		639.3	5,086.7		
Nov-12	5608.5		969.6	5,362.7		
Dec-12	6391.0	67,319.6	1196.8	6,049.3	66,772.9	

ATCO Electric Yukon
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Whitehorse (Includes Takhini & Deep Creek)

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	7,403.5		952.0	7,570.1		
Feb-13	5,904.4		665.4	6,138.1		
Mar-13	6,002.6		851.1	5,913.5		
Apr-13	6,195.8		639.9	5,993.4		
May-13	4,951.5		294.0	4,989.7		
Jun-13	5,024.9		112.4	5,098.5		
Jul-13	5,023.9		92.5	5,057.3		
Aug-13	5,111.1		98.9	5,213.1		
Sep-13	4,619.4		264.3	4,700.6		
Oct-13	5,004.4		501.4	5,063.5		
Nov-13	5,387.9		865.6	5,300.5		
Dec-13	5,956.0	66,585.6	1144.7	5,693.6	66,732.0	
Jan-14	6,892.4		745.8	7,373.0		
Feb-14	5,789.4		992.4	5,525.1		
Mar-14	6,026.9		855.1	5,931.7		
Apr-14	5,572.0		499.8	5,582.9		
May-14	4,906.6		269.5	4,982.1		
Jun-14	4,698.8		200.5	4,638.1		
Jul-14	4,872.9		98.0	4,898.0		
Aug-14	4,366.0		144.0	4,399.3		
Sep-14	4,901.2		307.1	4,917.2		
Oct-14	4,560.2		515.6	4,597.7		
Nov-14	5,617.3		772.8	5,671.3		
Dec-14	5,642.8	63,846.5	854.4	5,822.5	64,338.9	
Jan-15	7,066.4		927.0	7,271.1		
Feb-15	5,952.5		851.4	5,902.9		
Mar-15	5,706.8		671.3	5,891.5		
Apr-15	5,418.8		453.5	5,500.3		
May-15	4,730.1		192.9	4,922.3		
Jun-15	4,398.0		127.2	4,449.0		
Jul-15	4,703.8		115.7	4,701.9		
Aug-15	4,254.6		183.2	4,228.2		
Sep-15	4,776.7		332.7	4,753.7		
Oct-15	4,616.3		469.8	4,723.6		
Nov-15	5,305.0		759.2	5,379.7		
Dec-15	5,573.6	62,502.6	947.9	5,611.0	63,335.0	
Jan-16	6,588.3		827.6	6,944.4		
Feb-16	5,605.9		688.0	5,805.2		
Mar-16	5,511.4		611.6	5,787.1		
Apr-16	5,358.5					
May-16	4,795.4					
Jun-16	4,334.3					
Jul-16	4,580.7					
Aug-16	4,119.1					
Sep-16	4,631.1					
Oct-16	4,601.8					
Nov-16	5,241.0					
Dec-16	5,466.3	60,833.8			61,664.7	
Jan-17	6,765.3					
Feb-17	5,655.5					
Mar-17	5,637.9					
Apr-17	5,220.3					
May-17	4,671.7					
Jun-17	4,222.5					
Jul-17	4,462.5					
Aug-17	4,012.9					
Sep-17	4,511.7					
Oct-17	4,483.1					
Nov-17	5,105.9					
Dec-17	5,325.4	60,074.7			60,074.7	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Normalized UPC} / 2013 \text{ Normalized UPC}) ^{(1/(2015 - 2013))} - 1 =$$

$$= (63,335.0 / 66,732.0) ^{(1/2)} - 1 = \mathbf{-2.6\%}$$

Note: January, February and March 2016 have been updated to include actuals.

ATCO Electric Yukon
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Section 2
Attachment 21

Carmacks

Annual		Annual																																																						
Commercial	Actual	Actual / Forecast	(Whitehorse)	Normalized	Normalized																																																			
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)																																																			
Jan-95	3059.8		1020.1	3,096.8	Regression Output: SUMMARY OUTPUT Regression Statistics Multiple R0.57080631 R Square0.325819844 Adjusted R Square0.322032315 Standard Error427.1407803 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>15695083.88</td><td>15695083.88</td><td>86.02438327</td><td>5.96807E-17</td></tr><tr><td>Residual</td><td>178</td><td>32475965.83</td><td>182449.2462</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>48171049.71</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1965.42199</td><td>61.44455551</td><td>31.98691851</td><td>1.03119E-75</td><td>1844.168478</td><td>2086.675501</td><td>1844.168478</td><td>2086.675501</td></tr><tr><td>WH-HDD</td><td>0.895903626</td><td>0.09659408</td><td>9.27493306</td><td>5.96807E-17</td><td>0.705286714</td><td>1.086520537</td><td>0.705286714</td><td>1.086520537</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	15695083.88	15695083.88	86.02438327	5.96807E-17	Residual	178	32475965.83	182449.2462			Total	179	48171049.71					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1965.42199	61.44455551	31.98691851	1.03119E-75	1844.168478	2086.675501	1844.168478	2086.675501	WH-HDD	0.895903626	0.09659408	9.27493306	5.96807E-17	0.705286714	1.086520537	0.705286714	1.086520537
	df	SS	MS	F		Significance F																																																		
Regression	1	15695083.88	15695083.88	86.02438327		5.96807E-17																																																		
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Intercept	1965.42199	61.44455551	31.98691851	1.03119E-75		1844.168478	2086.675501	1844.168478	2086.675501																																															
WH-HDD	0.895903626	0.09659408	9.27493306	5.96807E-17		0.705286714	1.086520537	0.705286714	1.086520537																																															
Feb-95	2110.3		840.1	2,091.3																																																				
Mar-95	2700.2		880.0	2,621.9																																																				
Apr-95	2250.3		439.9	2,310.4																																																				
May-95	1864.0		250.7	1,925.3																																																				
Jun-95	1597.4		139.0	1,616.8																																																				
Jul-95	2145.2		96.6	2,161.2																																																				
Aug-95	1733.2		198.3	1,704.1																																																				
Sep-95	2055.8		226.5	2,137.4																																																				
Oct-95	1917.2		524.9	1,930.9																																																				
Nov-95	2208.6		894.4	2,131.4																																																				
Dec-95	2474.9	26,117.1	1048.6	2,406.6	26,134.3																																																			
Jan-96	3231.9		1556.4	2,788.4																																																				
Feb-96	3037.2		835.8	3,022.0																																																				
Mar-96	2484.4		805.8	2,472.6																																																				
Apr-96	2144.9		526.0	2,127.9																																																				
May-96	1819.6		357.3	1,785.3																																																				
Jun-96	2115.2		193.6	2,085.7																																																				
Jul-96	1854.4		124.9	1,845.0																																																				
Aug-96	1804.1		227.3	1,749.0																																																				
Sep-96	1886.6		362.6	1,846.3																																																				
Oct-96	1921.1		679.9	1,796.0																																																				
Nov-96	2566.8		975.0	2,417.4																																																				
Dec-96	2139.8	27,005.9	1155.8	1,975.5	25,911.1																																																			
Jan-97	3335.3		1185.7	3,223.9																																																				
Feb-97	2502.2		656.5	2,647.6																																																				
Mar-97	2189.1		855.4	2,132.9																																																				
Apr-97	2312.2		484.0	2,332.8																																																				
May-97	2044.5		331.1	2,033.7																																																				
Jun-97	1964.5		148.9	1,975.1																																																				
Jul-97	1983.1		92.8	2,002.5																																																				
Aug-97	2103.7		130.0	2,135.9																																																				
Sep-97	2001.2		282.1	2,033.1																																																				
Oct-97	2245.3		641.0	2,155.0																																																				
Nov-97	2816.4		694.0	2,918.7																																																				
Dec-97	2806.5	28,303.9	762.0	2,995.0	28,585.9																																																			
Jan-98	3407.1		1165.7	3,313.6																																																				
Feb-98	2603.4		719.1	2,692.8																																																				
Mar-98	2540.2		756.6	2,572.4																																																				
Apr-98	2255.1		458.6	2,298.4																																																				
May-98	2273.1		270.6	2,316.5																																																				
Jun-98	1816.3		119.5	1,853.2																																																				
Jul-98	2205.8		111.6	2,208.3																																																				
Aug-98	2398.6		189.2	2,377.7																																																				
Sep-98	2081.2		327.8	2,072.1																																																				
Oct-98	2420.1		557.7	2,404.4																																																				
Nov-98	2300.4		792.3	2,314.7																																																				
Dec-98	2498.7	28,800.0	1051.8	2,427.6	28,851.8																																																			
Jan-99	3817.6		1183.1	3,708.5																																																				
Feb-99	2790.0		976.4	2,648.9																																																				
Mar-99	2277.5		734.0	2,330.0																																																				
Apr-99	2284.5		508.8	2,282.8																																																				
May-99	1872.7		391.9	1,807.4																																																				
Jun-99	1859.0		153.9	1,865.1																																																				
Jul-99	2249.2		108.6	2,254.4																																																				
Aug-99	1932.0		145.7	1,950.0																																																				
Sep-99	2041.0		311.2	2,046.7																																																				
Oct-99	1891.8		499.8	1,928.0																																																				
Nov-99	3404.3		792.5	3,418.4																																																				
Dec-99	1228.5	27,647.9	844.0	1,343.5	27,583.7																																																			
Jan-00	2576.0		1082.9	2,556.7																																																				
Feb-00	1962.0		735.2	2,036.9																																																				
Mar-00	2114.0		659.2	2,233.5																																																				
Apr-00	1919.1		515.6	1,911.4																																																				
May-00	2227.8		382.0	2,171.4																																																				
Jun-00	1965.1		172.5	1,954.5																																																				
Jul-00	1674.1		142.1	1,649.3																																																				
Aug-00	1845.8		219.9	1,797.4																																																				
Sep-00	1998.5		354.2	1,965.8																																																				
Oct-00	1940.2		539.2	1,941.1																																																				
Nov-00	2117.0		691.2	2,221.8																																																				
Dec-00	2707.7	25,047.2	977.8	2,702.9	25,142.6																																																			

ATCO Electric Yukon
2016 - 2017 General Rate Application

Section 2
Attachment 21

Carmacks

Commercial Monthly	Annual		(Whitehorse)	Annual		Regression Output:
	Actual UPC (kWh)	Actual / Forecast UPC (kWh)		Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-01	2316.5		722.7	2,619.9		
Feb-01	2169.7		864.1	2,129.1		
Mar-01	2303.9		765.3	2,328.3		
Apr-01	1909.4		506.8	1,909.6		
May-01	2235.2		390.4	2,171.3		
Jun-01	2188.4		167.3	2,182.5		
Jul-01	2070.1		139.6	2,047.6		
Aug-01	1827.7		139.6	1,851.2		
Sep-01	2236.7		309.0	2,244.5		
Oct-01	1993.5		573.4	1,963.8		
Nov-01	2717.9		818.0	2,709.2		
Dec-01	2127.2	26,096.2	1094.6	2,017.7	26,174.6	
Jan-02	2777.9		935.6	2,890.6		
Feb-02	2970.1		824.6	2,965.0		
Mar-02	2406.8		921.1	2,291.6		
Apr-02	2316.4		653.3	2,185.3		
May-02	2402.4		361.6	2,364.3		
Jun-02	1788.1		175.6	1,774.7		
Jul-02	1941.3		130.9	1,926.6		
Aug-02	2350.8		182.8	2,335.6		
Sep-02	1918.1		314.4	1,921.0		
Oct-02	2398.3		444.3	2,484.2		
Nov-02	2077.8		582.6	2,279.9		
Dec-02	2534.3	27,882.1	845.2	2,648.3	28,067.0	
Jan-03	2655.8		989.1	2,720.5		
Feb-03	2427.9		756.6	2,483.7		
Mar-03	2333.2		834.5	2,295.6		
Apr-03	2280.5		514.3	2,274.0		
May-03	2074.5		363.7	2,034.5		
Jun-03	1711.7		192.8	1,682.9		
Jul-03	2133.7		84.4	2,160.7		
Aug-03	1778.6		180.6	1,765.4		
Sep-03	2062.5		359.2	2,025.2		
Oct-03	2293.9		466.7	2,359.7		
Nov-03	2280.8		874.6	2,221.3		
Dec-03	2842.9	26,875.9	911.6	2,897.4	26,920.9	
Jan-04	2814.7		1257.9	2,638.5		
Feb-04	2378.3		697.2	2,487.2		
Mar-04	2373.5		753.5	2,408.5		
Apr-04	2535.3		466.6	2,571.5		
May-04	1802.7		272.5	1,844.4		
Jun-04	1831.3		83.7	1,900.2		
Jul-04	2141.1		74.2	2,177.2		
Aug-04	1684.5		101.7	1,742.0		
Sep-04	2112.6		367.5	2,067.9		
Oct-04	2348.9		540.5	2,348.7		
Nov-04	2088.0		719.8	2,167.2		
Dec-04	2717.1	26,827.9	899.5	2,782.5	27,135.8	
Jan-05	3054.7		1165.8	2,961.1		
Feb-05	2283.6		795.2	2,304.7		
Mar-05	2177.4		613.7	2,337.7		
Apr-05	2472.8		453.3	2,520.9		
May-05	1946.7		256.6	2,002.6		
Jun-05	2139.5		154.4	2,145.1		
Jul-05	1763.4		132.6	1,747.1		
Aug-05	2439.0		150.8	2,452.5		
Sep-05	1810.0		299.3	1,826.4		
Oct-05	2204.7		534.6	2,209.7		
Nov-05	1771.2		762.6	1,812.0		
Dec-05	2239.8	26,302.6	794.4	2,399.3	26,719.2	
Jan-06	2839.8		1096.2	2,808.6		
Feb-06	2589.1		821.3	2,586.9		
Mar-06	2996.4		906.3	2,894.5		
Apr-06	1785.1		519.1	1,774.2		
May-06	2052.9		346.9	2,027.9		
Jun-06	2081.9		173.1	2,070.7		
Jul-06	1796.7		118.4	1,793.2		
Aug-06	1763.3		201.6	1,731.3		
Sep-06	2130.8		295.7	2,150.4		
Oct-06	2229.6		520.5	2,247.2		
Nov-06	2589.3		1162.2	2,272.2		
Dec-06	2971.3	27,826.2	824.3	3,104.0	27,461.3	

ATCO Electric Yukon
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Section 2
Attachment 21

Carmacks

Commercial Monthly	Annual		(Whitehorse)	Annual		Regression Output:
	Actual UPC (kWh)	Actual / Forecast UPC (kWh)		Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-07	3095.2		912.0	3,228.9		
Feb-07	5504.8		998.8	5,343.5		
Mar-07	3875.8		954.2	3,731.0		
Apr-07	2434.4		511.9	2,430.0		
May-07	1855.4		322.1	1,852.6		
Jun-07	2548.6		140.5	2,566.7		
Jul-07	1925.9		102.3	1,936.8		
Aug-07	2285.1		154.2	2,295.6		
Sep-07	2065.2		308.4	2,073.4		
Oct-07	2116.0		543.7	2,112.9		
Nov-07	2869.1		724.6	2,944.0		
Dec-07	2408.5	32,984.1	1069.5	2,321.6	32,837.2	
Jan-08	3458.0		1113.8	3,411.0		
Feb-08	3262.5		954.6	3,140.8		
Mar-08	2727.5		734.7	2,779.3		
Apr-08	2375.5		517.3	2,366.2		
May-08	2328.6		307.9	2,338.6		
Jun-08	2198.3		225.6	2,140.1		
Jul-08	1669.7		173.4	1,616.9		
Aug-08	2137.9		187.7	2,118.3		
Sep-08	2066.8		318.7	2,065.8		
Oct-08	2492.8		563.0	2,472.3		
Nov-08	2511.5		782.5	2,534.5		
Dec-08	2595.1	29,824.1	1186.2	2,403.6	29,387.7	
Jan-09	3020.7		1137.9	2,952.1		
Feb-09	2726.2		955.4	2,603.9		
Mar-09	1863.0		868.5	1,795.0		
Apr-09	1911.5		515.2	1,904.1		
May-09	2693.9		331.2	2,683.1		
Jun-09	2617.0		144.1	2,631.8		
Jul-09	2135.5		62.5	2,182.0		
Aug-09	2002.3		158.3	2,009.0		
Sep-09	2071.7		306.1	2,082.0		
Oct-09	2286.2		541.8	2,284.8		
Nov-09	2229.8		781.5	2,253.7		
Dec-09	2261.6	27,819.3	955.2	2,277.0	27,658.6	
Jan-10	3848.8		991.1	3,911.7		
Feb-10	2602.1		679.2	2,727.2		
Mar-10	2512.6		656.0	2,635.0		
Apr-10	2260.4		461.2	2,301.4		
May-10	2164.3		292.0	2,188.5		
Jun-10	3007.7		171.9	2,997.6		
Jul-10	2134.0		117.3	2,131.5		
Aug-10	1082.0		146.2	1,099.6		
Sep-10	1472.4		332.4	1,459.1		
Oct-10	3870.3		520.4	3,888.0		
Nov-10	2831.4		717.6	2,912.6		
Dec-10	2636.8	30,422.7	1162.5	2,466.5	30,718.8	
Jan-11	3538.1		1010.2	3,583.9		
Feb-11	2866.7		905.6	2,789.0		
Mar-11	3065.2		904.4	2,965.0		
Apr-11	2153.8		511.2	2,150.0		
May-11	2893.5		296.4	2,913.8		
Jun-11	1972.0		161.0	1,971.7		
Jul-11	2332.2		127.8	2,320.2		
Aug-11	2201.9		218.3	2,154.9		
Sep-11	2686.0		328.6	2,676.1		
Nov-11	2471.6		513.4	2,495.6		
Nov-11	2984.2		936.1	2,869.6		
Dec-11	2762.0	31,927.0	774.4	2,939.5	31,829.4	
Jan-12	3195.4		1118.1	3,144.5		
Feb-12	2725.3		691.7	2,839.1		
Mar-12	3297.5		756.2	3,330.1		
Apr-12	2590.6		450.6	2,641.1		
May-12	2287.4		350.8	2,259.0		
Jun-12	2503.0		195.1	2,472.1		
Jul-12	2134.7		140.1	2,111.7		
Aug-12	2473.6		157.9	2,480.8		
Sep-12	2079.2		271.0	2,120.9		
Oct-12	2649.0		639.3	2,560.2		
Nov-12	2820.0		969.6	2,675.4		
Dec-12	2629.5	31,385.0	1196.8	2,428.4	31,063.5	

ATCO Electric Yukon
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Section 2
Attachment 21

Carmacks

Commercial Monthly	Actual UPC (kWh)	Annual		Normalized UPC (kWh)	Annual		Regression Output:
		Actual / Forecast	(Whitehorse)		Normalized	Normalized	
		UPC (kWh)	MHDD		UPC (kWh)	UPC (kWh)	
Jan-13	3,098.4		952.0		3,196.4		
Feb-13	2,705.0		665.4		2,842.5		
Mar-13	2,895.5		851.1		2,843.1		
Apr-13	3,143.9		639.9		3,024.8		
May-13	2,753.4		294.0		2,775.9		
Jun-13	1,823.0		112.4		1,866.3		
Jul-13	2,222.3		92.5		2,242.0		
Aug-13	2,270.0		98.9		2,330.0		
Sep-13	2,044.0		264.3		2,091.7		
Oct-13	2,627.4		501.4		2,662.2		
Nov-13	2,770.4		865.6		2,719.0		
Dec-13	2,576.3	30,929.7	1,144.7		2,421.9	31,015.8	
Jan-14	3,848.6		745.8		4,131.3		
Feb-14	2,847.7		992.4		2,692.2		
Mar-14	2,695.9		855.1		2,639.9		
Apr-14	2,504.1		499.8		2,510.5		
May-14	2,603.8		269.5		2,648.2		
Jun-14	2,347.7		200.5		2,312.1		
Jul-14	2,033.0		98.0		2,047.7		
Aug-14	2,373.3		144.0		2,392.9		
Sep-14	2,313.6		307.1		2,323.0		
Oct-14	2,732.0		515.6		2,754.0		
Nov-14	2,403.1		772.8		2,434.8		
Dec-14	3,276.0	31,978.7	854.4		3,381.7	32,268.4	
Jan-15	3,133.6		927.0		3,254.0		
Feb-15	2,469.0		851.4		2,439.8		
Mar-15	2,822.0		671.3		2,930.7		
Apr-15	2,866.7		453.5		2,914.7		
May-15	2,250.2		192.9		2,363.2		
Jun-15	2,314.8		127.2		2,344.8		
Jul-15	2,840.1		115.7		2,839.1		
Aug-15	2,106.0		183.2		2,090.5		
Sep-15	2,720.1		332.7		2,706.5		
Oct-15	2,812.1		469.8		2,875.1		
Nov-15	2,939.7		759.2		2,983.6		
Dec-15	3,156.8	32,431.1	947.9		3,178.8	32,920.8	
Jan-16	3,254.3		827.6		3,463.7		
Feb-16	3,049.8		688.0		3,167.0		
Mar-16	3,026.9		611.6		3,189.1		
Apr-16	2,935.5						
May-16	2,304.1						
Jun-16	2,370.3						
Jul-16	2,908.3						
Aug-16	2,156.5						
Sep-16	2,785.3						
Oct-16	2,879.5						
Nov-16	3,010.2						
Dec-16	3,232.5	33,913.3				34,402.1	
Jan-17	3,332.4						
Feb-17	3,122.9						
Mar-17	3,099.5						
Apr-17	3,005.9						
May-17	2,359.4						
Jun-17	2,427.2						
Jul-17	2,978.0						
Aug-17	2,208.2						
Sep-17	2,852.1						
Oct-17	2,948.6						
Nov-17	3,082.4						
Dec-17	3,310.0	34,726.7				34,726.7	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ { (1/(2015 - 2013)) } - 1 =$$

$$= (32,431.1 / 30,929.7) ^ { (1/2) } - 1 = \mathbf{2.4\%}$$

Note: January, February and March 2016 have been updated to include actuals.

ATCO Electric Yukon
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Section 2
Attachment 22

Carcross

Commercial	Annual		(Whitehorse)	Annual		Regression Output:																																																			
	Actual / Forecast	UPC (kWh)		Normalized	UPC (kWh)																																																				
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)																																																				
Jan-95	1999.0		1020.1	2,012.2		SUMMARY OUTPUT Regression Statistics Multiple R0.405860741 R Square0.164722941 Adjusted R Square0.160030374 Standard Error238.6921965 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>1999953.874</td><td>1999953.874</td><td>35.1029437</td><td>1.58191E-08</td></tr><tr><td>Residual</td><td>178</td><td>10141365.71</td><td>56973.96467</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>12141319.58</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1472.864074</td><td>34.32987891</td><td>42.90327028</td><td>8.5527E-96</td><td>1405.118147</td><td>1540.610001</td><td>1405.118147</td><td>1540.610001</td></tr><tr><td>WH-HDD</td><td>0.319835737</td><td>0.053982777</td><td>5.924773726</td><td>1.58191E-08</td><td>0.213307157</td><td>0.426364317</td><td>0.213307157</td><td>0.426364317</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	1999953.874	1999953.874	35.1029437	1.58191E-08	Residual	178	10141365.71	56973.96467			Total	179	12141319.58					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1472.864074	34.32987891	42.90327028	8.5527E-96	1405.118147	1540.610001	1405.118147	1540.610001	WH-HDD	0.319835737	0.053982777	5.924773726	1.58191E-08	0.213307157	0.426364317	0.213307157	0.426364317
	df	SS	MS	F	Significance F																																																				
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Intercept	1472.864074	34.32987891	42.90327028	8.5527E-96	1405.118147		1540.610001	1405.118147	1540.610001																																																
WH-HDD	0.319835737	0.053982777	5.924773726	1.58191E-08	0.213307157		0.426364317	0.213307157	0.426364317																																																
Feb-95	2033.3		840.1	2,026.5																																																					
Mar-95	1943.1		880.0	1,915.1																																																					
Apr-95	1745.5		439.9	1,767.0																																																					
May-95	1640.1		250.7	1,662.0																																																					
Jun-95	1823.3		139.0	1,830.2																																																					
Jul-95	2008.8		96.6	2,014.5																																																					
Aug-95	1734.4		198.3	1,724.1																																																					
Sep-95	1915.9		226.5	1,945.0																																																					
Oct-95	1691.5		524.9	1,696.3																																																					
Nov-95	1737.2		894.4	1,709.7																																																					
Dec-95	1898.6	22,170.5	1048.6	1,874.2	22,176.7																																																				
Jan-96	2511.6		1530.1	2,361.6																																																					
Feb-96	2558.1		835.8	2,552.7																																																					
Mar-96	2208.8		805.8	2,204.6																																																					
Apr-96	1912.0		526.0	1,905.9																																																					
May-96	1852.6		357.3	1,840.4																																																					
Jun-96	1979.0		193.6	1,968.4																																																					
Jul-96	1874.0		124.9	1,870.6																																																					
Aug-96	1731.3		227.3	1,711.7																																																					
Sep-96	2082.4		362.6	2,068.0																																																					
Oct-96	1746.3		679.9	1,701.6																																																					
Nov-96	1924.8		975.0	1,871.5																																																					
Dec-96	1880.2	24,261.1	1155.8	1,821.5	23,878.6																																																				
Jan-97	2389.2		1185.7	2,349.4																																																					
Feb-97	2134.8		656.5	2,186.8																																																					
Mar-97	1921.7		855.4	1,901.6																																																					
Apr-97	1893.1		484.0	1,900.4																																																					
May-97	1461.1		331.1	1,457.2																																																					
Jun-97	2082.0		148.9	2,085.8																																																					
Jul-97	1962.0		92.8	1,968.9																																																					
Aug-97	1858.7		130.0	1,870.2																																																					
Sep-97	1818.5		282.1	1,829.9																																																					
Oct-97	1613.9		641.0	1,581.7																																																					
Nov-97	2259.4		685.8	2,298.5																																																					
Dec-97	1680.7	23,075.1	762.0	1,747.9	23,178.4																																																				
Jan-98	1930.4		1165.7	1,897.0																																																					
Feb-98	2007.2		719.1	2,039.1																																																					
Mar-98	1853.3		756.6	1,864.8																																																					
Apr-98	1604.9		458.6	1,620.4																																																					
May-98	1630.5		270.6	1,646.0																																																					
Jun-98	1651.9		119.5	1,665.1																																																					
Jul-98	1700.8		111.6	1,701.7																																																					
Aug-98	1718.4		189.2	1,711.0																																																					
Sep-98	1663.5		327.8	1,660.2																																																					
Oct-98	1572.2		557.7	1,566.6																																																					
Nov-98	1795.3		792.3	1,800.4																																																					
Dec-98	1769.3	20,897.6	1051.8	1,743.9	20,916.0																																																				
Jan-99	2034.7		1183.1	1,995.8																																																					
Feb-99	2050.7		976.4	2,000.3																																																					
Mar-99	1901.1		734.0	1,919.8																																																					
Apr-99	1649.7		508.8	1,649.1																																																					
May-99	1464.5		391.9	1,441.3																																																					
Jun-99	1656.0		153.9	1,658.1																																																					
Jul-99	1659.1		108.6	1,660.9																																																					
Aug-99	1551.7		145.7	1,558.2																																																					
Sep-99	1590.2		311.2	1,592.2																																																					
Oct-99	1491.0		499.8	1,504.0																																																					
Nov-99	1555.6		792.5	1,560.6																																																					
Dec-99	1863.1	20,467.4	844.0	1,904.2	20,444.5																																																				
Jan-00	1847.3		1082.9	1,840.4																																																					
Feb-00	1830.0		735.2	1,856.8																																																					
Mar-00	1751.9		659.2	1,794.6																																																					
Apr-00	1615.3		515.6	1,612.5																																																					
May-00	1429.4		382.0	1,409.3																																																					
Jun-00	1750.4		172.5	1,746.6																																																					
Jul-00	1631.5		142.1	1,622.6																																																					
Aug-00	1499.4		219.7	1,482.2																																																					
Sep-00	1694.3		354.2	1,682.6																																																					
Oct-00	1432.1		537.2	1,433.1																																																					
Nov-00	1539.2		694.2	1,575.6																																																					
Dec-00	1772.3	19,793.1	973.0	1,772.1	19,828.4																																																				

ATCO Electric Yukon
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Section 2
Attachment 22

Carcross

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2094.7		724.6	2,202.4		
Feb-01	1897.6		864.1	1,883.1		
Mar-01	2174.6		765.3	2,183.3		
Apr-01	1584.6		505.3	1,585.1		
May-01	1375.9		390.4	1,353.1		
Jun-01	1854.8		167.3	1,852.7		
Jul-01	1489.3		139.6	1,481.3		
Aug-01	1578.2		139.6	1,586.6		
Sep-01	1507.9		309.0	1,510.7		
Oct-01	1476.8		573.4	1,466.2		
Nov-01	1712.4		818.0	1,709.2		
Dec-01	2093.8	20,840.7	1094.6	2,054.7	20,868.5	
Jan-02	2345.1		938.1	2,384.5		
Feb-02	2023.6		824.6	2,021.7		
Mar-02	1892.8		921.0	1,851.7		
Apr-02	1784.5		653.3	1,737.7		
May-02	1516.1		361.6	1,502.5		
Jun-02	1703.5		175.6	1,698.7		
Jul-02	1659.3		130.9	1,654.0		
Aug-02	1750.9		182.8	1,745.5		
Sep-02	1582.0		314.4	1,583.0		
Oct-02	1455.1		444.3	1,485.8		
Nov-02	1300.3		582.6	1,372.5		
Dec-02	1367.9	20,381.0	845.1	1,408.6	20,446.3	
Jan-03	1633.9		992.6	1,655.8		
Feb-03	1508.0		756.6	1,527.9		
Mar-03	1589.3		832.2	1,576.6		
Apr-03	1432.3		514.3	1,430.0		
May-03	1272.5		363.7	1,258.3		
Jun-03	1697.5		192.8	1,687.2		
Jul-03	1743.2		84.2	1,752.9		
Aug-03	1678.6		180.6	1,673.9		
Sep-03	1751.1		359.2	1,737.8		
Oct-03	1376.7		466.7	1,400.2		
Nov-03	1616.2		874.6	1,595.0		
Dec-03	1775.9	19,075.3	911.6	1,795.4	19,091.0	
Jan-04	1907.0		1254.0	1,845.3		
Feb-04	1808.8		697.2	1,847.7		
Mar-04	1611.8		753.5	1,624.3		
Apr-04	1899.4		466.6	1,912.3		
May-04	1525.8		272.5	1,540.7		
Jun-04	1475.4		83.7	1,500.1		
Jul-04	1937.7		74.2	1,950.5		
Aug-04	1581.8		101.7	1,602.4		
Sep-04	1514.8		367.5	1,498.8		
Oct-04	1608.2		540.5	1,608.1		
Nov-04	1488.9		719.8	1,517.2		
Dec-04	1560.7	19,920.3	899.5	1,584.0	20,031.5	
Jan-05	1878.0		1165.8	1,844.6		
Feb-05	1710.3		795.2	1,717.9		
Mar-05	1797.0		613.7	1,854.2		
Apr-05	1432.6		453.3	1,449.8		
May-05	1263.6		256.6	1,283.6		
Jun-05	1502.6		154.4	1,504.6		
Jul-05	1717.7		132.6	1,711.9		
Aug-05	1324.9		150.8	1,329.7		
Sep-05	1635.5		299.3	1,641.4		
Oct-05	1454.8		534.6	1,456.5		
Nov-05	1523.2		762.6	1,537.8		
Dec-05	1515.6	18,755.9	794.4	1,572.5	18,904.6	
Jan-06	1773.7		1096.2	1,762.6		
Feb-06	1577.0		821.3	1,576.2		
Mar-06	1517.0		906.3	1,480.6		
Apr-06	1611.5		519.1	1,607.6		
May-06	1293.9		346.9	1,285.0		
Jun-06	1820.7		173.1	1,816.7		
Jul-06	1586.5		118.4	1,585.3		
Aug-06	1663.2		201.6	1,651.8		
Sep-06	1819.7		295.7	1,826.7		
Oct-06	1797.1		520.5	1,803.4		
Nov-06	1380.9		1162.2	1,267.6		
Dec-06	1923.2	19,764.4	824.3	1,970.6	19,634.2	

ATCO Electric Yukon
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Section 2
Attachment 22

Carcross

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	1913.4		912.0	1,961.2		
Feb-07	2139.7		998.8	2,082.1		
Mar-07	2088.0		954.2	2,036.3		
Apr-07	2032.8		486.4	2,039.4		
May-07	1331.8		322.1	1,330.8		
Jun-07	1588.8		140.5	1,595.3		
Jul-07	1851.1		102.3	1,855.0		
Aug-07	1763.1		154.2	1,766.9		
Sep-07	1794.4		308.4	1,797.4		
Oct-07	1437.0		543.7	1,435.8		
Nov-07	1557.8		724.6	1,584.5		
Dec-07	1826.7	21,324.6	1069.5	1,795.6	21,280.4	
Jan-08	1972.1		1113.8	1,955.4		
Feb-08	2178.2		954.6	2,134.8		
Mar-08	1737.0		734.7	1,755.5		
Apr-08	1681.2		517.3	1,677.9		
May-08	1549.5		307.9	1,553.1		
Jun-08	1522.1		225.6	1,501.4		
Jul-08	1573.0		173.4	1,554.2		
Aug-08	1731.1		187.7	1,724.1		
Sep-08	1504.8		318.7	1,504.4		
Oct-08	1283.7		563.0	1,276.4		
Nov-08	1460.4		782.5	1,468.6		
Dec-08	1836.8	20,030.0	1186.2	1,768.4	19,874.2	
Jan-09	2155.9		1137.9	2,131.4		
Feb-09	2119.2		955.4	2,075.5		
Mar-09	1862.0		868.5	1,837.7		
Apr-09	1829.8		515.2	1,827.2		
May-09	2092.5		331.2	2,088.6		
Jun-09	1422.2		144.1	1,427.5		
Jul-09	1671.5		62.5	1,688.1		
Aug-09	1484.6		158.3	1,487.1		
Sep-09	1554.7		306.1	1,558.3		
Oct-09	1715.3		541.8	1,714.8		
Nov-09	1323.6		781.5	1,332.1		
Dec-09	1707.6	20,938.8	955.2	1,713.1	20,881.5	
Jan-10	1952.1		991.1	1,974.6		
Feb-10	2022.4		679.2	2,067.0		
Mar-10	1739.5		656.0	1,783.2		
Apr-10	1662.4		461.2	1,677.1		
May-10	1342.2		292.0	1,350.8		
Jun-10	1443.6		171.9	1,440.0		
Jul-10	1502.7		117.3	1,501.8		
Aug-10	1425.7		146.2	1,432.0		
Sep-10	1761.2		332.4	1,756.5		
Oct-10	1452.3		520.4	1,458.6		
Nov-10	1826.9		717.6	1,855.9		
Dec-10	1983.5	20,114.5	1162.5	1,922.7	20,220.2	
Jan-11	2676.4		1010.2	2,692.8		
Feb-11	1873.1		905.6	1,845.4		
Mar-11	2629.7		901.7	2,594.8		
Apr-11	1775.5		511.2	1,774.1		
May-11	1484.2		296.4	1,491.4		
Jun-11	1659.3		161.0	1,659.2		
Jul-11	1387.9		127.8	1,383.6		
Aug-11	1405.9		217.9	1,389.2		
Sep-11	1584.4		328.5	1,580.9		
Nov-11	1350.8		513.3	1,359.4		
Nov-11	1457.0		931.7	1,417.5		
Dec-11	2071.3	21,355.5	775.1	2,134.4	21,322.8	
Jan-12	1633.8		1118.1	1,615.7		
Feb-12	2191.1		691.7	2,231.7		
Mar-12	1753.3		756.2	1,764.9		
Apr-12	1481.7		450.6	1,499.8		
May-12	1455.9		350.8	1,445.7		
Jun-12	1409.9		195.1	1,398.8		
Jul-12	1433.8		140.1	1,425.6		
Aug-12	1329.7		157.9	1,332.3		
Sep-12	1223.3		271.0	1,238.2		
Oct-12	1229.3		639.3	1,197.6		
Nov-12	1424.1		969.6	1,372.5		
Dec-12	1600.7	18,166.6	1196.8	1,528.9	18,051.8	

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Carcross

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	2,054.7		952.0	2,089.6		
Feb-13	1,953.8		665.4	2,002.8		
Mar-13	1,525.9		851.1	1,507.2		
Apr-13	1,641.3		639.9	1,598.8		
May-13	1,772.1		294.0	1,780.1		
Jun-13	1,795.6		112.4	1,811.0		
Jul-13	1,413.0		92.5	1,420.0		
Aug-13	1,476.0		98.9	1,497.4		
Sep-13	1,305.8		264.3	1,322.9		
Oct-13	1,246.6		501.4	1,259.0		
Nov-13	1,345.3		865.6	1,327.0		
Dec-13	1,413.8	18,943.7	1,144.7	1,358.7	18,974.5	
Jan-14	1,975.2		745.8	2,076.1		
Feb-14	1,602.1		992.4	1,546.6		
Mar-14	1,851.8		855.1	1,831.8		
Apr-14	1,574.1		499.8	1,576.5		
May-14	1,465.0		269.5	1,480.9		
Jun-14	1,458.5		200.5	1,445.8		
Jul-14	1,504.1		98.0	1,509.4		
Aug-14	1,527.1		144.0	1,534.1		
Sep-14	1,276.3		307.1	1,279.6		
Oct-14	1,613.5		515.6	1,621.4		
Nov-14	1,319.6		772.8	1,331.0		
Dec-14	1,378.9	18,546.3	854.4	1,416.6	18,649.7	
Jan-15	1,882.9		927.0	1,925.9		
Feb-15	1,682.9		851.4	1,672.5		
Mar-15	1,732.9		671.3	1,771.7		
Apr-15	1,345.6		453.5	1,362.8		
May-15	1,529.1		192.9	1,569.5		
Jun-15	1,314.3		127.2	1,325.0		
Jul-15	1,342.5		115.7	1,342.1		
Aug-15	1,523.5		183.2	1,518.0		
Sep-15	1,391.4		332.7	1,386.5		
Oct-15	1,566.0		469.8	1,588.5		
Nov-15	1,311.4		759.2	1,327.0		
Dec-15	1,646.8	18,269.3	947.9	1,654.6	18,444.1	
Jan-16	2,021.0		827.6	2,095.8		
Feb-16	1,760.9		688.0	1,802.8		
Mar-16	2,014.5		611.6	2,072.3		
Apr-16	1,321.5					
May-16	1,501.7					
Jun-16	1,290.7					
Jul-16	1,318.4					
Aug-16	1,496.2					
Sep-16	1,366.4					
Oct-16	1,537.8					
Nov-16	1,287.8					
Dec-16	1,617.2	18,534.0			18,708.5	
Jan-17	1,984.7					
Feb-17	1,729.3					
Mar-17	1,978.3					
Apr-17	1,297.7					
May-17	1,474.7					
Jun-17	1,267.5					
Jul-17	1,294.7					
Aug-17	1,469.3					
Sep-17	1,341.8					
Oct-17	1,510.2					
Nov-17	1,264.7					
Dec-17	1,588.2	18,201.1			18,201.1	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (18,269.3 / 18,943.7) ^ {1/2} - 1 = \mathbf{-1.8\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Haines Junction

Commercial Monthly	Annual		MHDD	Annual		Regression Output:																																																		
	UPC (kWh)	Actual / Forecast (Whitehorse)		Normalized UPC (kWh)	Normalized UPC (kWh)																																																			
Jan-95	2901.0		1020.1	2,924.3	SUMMARY OUTPUT Regression Statistics Multiple R0.575798559 R Square0.33154398 Adjusted R Square0.32778861 Standard Error266.0823452 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>6250581.616</td><td>6250581.616</td><td>88.28528248</td><td>2.77074E-17</td></tr><tr><td>Residual</td><td>178</td><td>12602366.97</td><td>70799.81442</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>18852948.58</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1991.761555</td><td>38.26926404</td><td>52.04598533</td><td>1.2597E-109</td><td>1916.24172</td><td>2067.281389</td><td>1916.24172</td><td>2067.281389</td></tr><tr><td>WH-HDD</td><td>0.565427873</td><td>0.06017735</td><td>9.396024823</td><td>2.77074E-17</td><td>0.446675041</td><td>0.684180706</td><td>0.446675041</td><td>0.684180706</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	6250581.616	6250581.616	88.28528248	2.77074E-17	Residual	178	12602366.97	70799.81442			Total	179	18852948.58					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1991.761555	38.26926404	52.04598533	1.2597E-109	1916.24172	2067.281389	1916.24172	2067.281389	WH-HDD	0.565427873	0.06017735	9.396024823	2.77074E-17	0.446675041	0.684180706	0.446675041	0.684180706
	df	SS	MS	F		Significance F																																																		
Regression	1	6250581.616	6250581.616	88.28528248		2.77074E-17																																																		
Residual	178	12602366.97	70799.81442																																																					
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	1991.761555	38.26926404	52.04598533	1.2597E-109		1916.24172	2067.281389	1916.24172	2067.281389																																															
WH-HDD	0.565427873	0.06017735	9.396024823	2.77074E-17		0.446675041	0.684180706	0.446675041	0.684180706																																															
Feb-95	2529.0		840.1	2,517.0																																																				
Mar-95	2584.9		880.0	2,535.4																																																				
Apr-95	2066.0		439.9	2,103.9																																																				
May-95	2098.0		250.7	2,136.7																																																				
Jun-95	2107.0		139.0	2,119.3																																																				
Jul-95	2319.9		96.6	2,330.0																																																				
Aug-95	2063.6		198.3	2,045.3																																																				
Sep-95	2286.8		226.5	2,338.3																																																				
Oct-95	2047.6		524.9	2,056.3																																																				
Nov-95	2084.0		894.4	2,035.3																																																				
Dec-95	2651.3	27,739.2	1048.6	2,608.2	27,750.0																																																			
Jan-96	2862.2		1530.1	2,597.2																																																				
Feb-96	2895.5		835.8	2,885.9																																																				
Mar-96	2614.9		805.8	2,607.4																																																				
Apr-96	2644.8		526.0	2,634.0																																																				
May-96	2249.7		357.3	2,228.1																																																				
Jun-96	2103.3		193.6	2,084.7																																																				
Jul-96	2266.7		124.9	2,260.8																																																				
Aug-96	2276.1		227.3	2,241.4																																																				
Sep-96	1837.7		362.6	1,812.2																																																				
Oct-96	1812.1		679.9	1,733.1																																																				
Nov-96	2479.4		975.0	2,385.1																																																				
Dec-96	2429.2	28,471.6	1155.8	2,325.5	27,795.4																																																			
Jan-97	3157.1		1185.7	3,086.7																																																				
Feb-97	2720.5		656.5	2,812.3																																																				
Mar-97	2585.0		855.4	2,549.4																																																				
Apr-97	2242.7		484.0	2,255.7																																																				
May-97	2211.9		331.1	2,205.1																																																				
Jun-97	2135.5		148.9	2,142.2																																																				
Jul-97	2340.2		92.8	2,352.5																																																				
Aug-97	2122.5		130.0	2,142.7																																																				
Sep-97	2013.0		282.1	2,033.1																																																				
Oct-97	2044.3		641.0	1,987.4																																																				
Nov-97	2802.5		685.8	2,871.7																																																				
Dec-97	2445.4	28,820.4	762.0	2,564.3	29,003.1																																																			
Jan-98	3007.2		1165.7	2,948.2																																																				
Feb-98	2432.7		719.1	2,489.1																																																				
Mar-98	2561.9		756.6	2,582.3																																																				
Apr-98	2206.6		458.6	2,233.9																																																				
May-98	1916.0		270.6	1,943.4																																																				
Jun-98	1977.5		119.5	2,000.8																																																				
Jul-98	2201.9		111.6	2,203.5																																																				
Aug-98	2034.7		189.2	2,021.5																																																				
Sep-98	2109.2		327.8	2,103.5																																																				
Oct-98	2096.0		557.7	2,086.1																																																				
Nov-98	2449.9		792.3	2,458.9																																																				
Dec-98	2236.0	27,229.8	1051.8	2,191.2	27,262.5																																																			
Jan-99	2663.9		1183.1	2,595.0																																																				
Feb-99	2497.3		976.4	2,408.2																																																				
Mar-99	2441.0		734.0	2,474.1																																																				
Apr-99	2419.6		508.8	2,418.5																																																				
May-99	1978.2		391.9	1,937.0																																																				
Jun-99	2180.9		153.9	2,184.7																																																				
Jul-99	2057.8		108.6	2,061.1																																																				
Aug-99	2182.2		145.7	2,193.6																																																				
Sep-99	2244.9		311.2	2,248.5																																																				
Oct-99	2123.8		499.8	2,146.6																																																				
Nov-99	2568.1		792.5	2,577.0																																																				
Dec-99	2585.1	27,942.6	844.0	2,657.7	27,902.1																																																			
Jan-00	2785.8		1082.9	2,773.6																																																				
Feb-00	2525.4		735.2	2,572.7																																																				
Mar-00	2554.8		659.2	2,630.3																																																				
Apr-00	2308.3		515.6	2,303.5																																																				
May-00	2136.9		382.0	2,101.3																																																				
Jun-00	2407.6		172.5	2,400.9																																																				
Jul-00	2320.5		142.1	2,304.9																																																				
Aug-00	2274.2		219.7	2,243.7																																																				
Sep-00	2174.0		354.2	2,153.3																																																				
Oct-00	2234.3		537.2	2,236.0																																																				
Nov-00	2375.0		694.2	2,439.5																																																				
Dec-00	2430.3	28,527.2	973.0	2,430.0	28,589.7																																																			

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Haines Junction

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2826.9		724.6	3,017.3		
Feb-01	2654.5		864.1	2,628.9		
Mar-01	2328.9		765.3	2,344.4		
Apr-01	2154.2		505.3	2,155.1		
May-01	2207.0		390.4	2,166.6		
Jun-01	2364.5		167.3	2,360.8		
Jul-01	2257.8		139.6	2,243.6		
Aug-01	2216.3		139.6	2,231.1		
Sep-01	1962.6		309.0	1,967.5		
Oct-01	2145.7		573.4	2,126.9		
Nov-01	2423.7		818.0	2,418.2		
Dec-01	2565.2	28,107.3	1094.6	2,496.1	28,156.5	
Jan-02	2928.0		938.1	2,997.7		
Feb-02	2520.6		824.6	2,517.3		
Mar-02	2418.3		921.0	2,345.7		
Apr-02	2357.9		653.3	2,275.2		
May-02	2208.3		361.6	2,184.2		
Jun-02	2128.8		175.6	2,120.4		
Jul-02	2311.4		130.9	2,302.1		
Aug-02	2335.9		182.8	2,326.3		
Sep-02	2005.2		314.4	2,007.0		
Oct-02	2340.6		444.3	2,394.8		
Nov-02	2598.1		582.6	2,725.7		
Dec-02	2297.9	28,451.0	845.1	2,369.9	28,566.4	
Jan-03	2980.7		992.6	3,019.6		
Feb-03	2572.2		756.6	2,607.4		
Mar-03	2470.8		832.2	2,448.4		
Apr-03	2234.7		514.3	2,230.6		
May-03	1980.6		363.7	1,955.3		
Jun-03	2215.0		192.8	2,196.9		
Jul-03	2416.7		84.2	2,433.8		
Aug-03	2319.8		180.6	2,311.5		
Sep-03	2206.2		359.2	2,182.7		
Oct-03	2082.0		466.7	2,123.5		
Nov-03	2302.9		874.6	2,265.4		
Dec-03	2343.3	28,124.7	911.6	2,377.7	28,152.6	
Jan-04	2722.0		1254.0	2,613.0		
Feb-04	2478.2		697.2	2,547.0		
Mar-04	2201.5		753.5	2,223.6		
Apr-04	2372.9		466.6	2,395.7		
May-04	1850.8		272.5	1,877.1		
Jun-04	1855.8		83.7	1,899.3		
Jul-04	2507.6		74.2	2,530.4		
Aug-04	2108.7		101.7	2,145.0		
Sep-04	2131.2		367.5	2,103.0		
Oct-04	1972.8		540.5	1,972.7		
Nov-04	2105.3		719.8	2,155.3		
Dec-04	2339.9	26,646.7	899.5	2,381.2	26,843.3	
Jan-05	2476.6		1165.8	2,417.5		
Feb-05	2387.0		795.2	2,400.3		
Mar-05	1898.8		613.7	2,000.0		
Apr-05	2292.5		453.3	2,322.9		
May-05	1843.9		256.6	1,879.2		
Jun-05	1924.0		154.4	1,927.6		
Jul-05	2126.1		132.6	2,115.9		
Aug-05	1950.3		150.8	1,958.9		
Sep-05	2161.0		299.3	2,171.3		
Oct-05	1910.1		534.6	1,913.2		
Nov-05	2245.6		762.6	2,271.4		
Dec-05	2240.2	25,456.2	794.4	2,340.9	25,719.1	
Jan-06	2485.7		1096.2	2,466.0		
Feb-06	2364.7		821.3	2,363.3		
Mar-06	2375.1		906.3	2,310.8		
Apr-06	2028.3		519.1	2,021.5		
May-06	1961.4		346.9	1,945.6		
Jun-06	2060.0		173.1	2,053.0		
Jul-06	2270.8		118.4	2,268.6		
Aug-06	1885.7		201.6	1,865.5		
Sep-06	2103.9		295.7	2,116.3		
Oct-06	1836.8		520.5	1,848.0		
Nov-06	2058.5		1162.2	1,858.3		
Dec-06	2261.6	25,692.5	824.3	2,345.4	25,462.2	

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Haines Junction

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	2624.6		912.0	2,709.0		
Feb-07	2319.2		998.8	2,217.5		
Mar-07	2286.8		954.2	2,195.4		
Apr-07	2341.8		486.4	2,353.5		
May-07	1767.0		322.1	1,765.3		
Jun-07	2291.7		140.5	2,303.1		
Jul-07	1880.2		102.3	1,887.1		
Aug-07	1916.0		154.2	1,922.6		
Sep-07	2271.3		308.4	2,276.5		
Oct-07	1718.3		543.7	1,716.3		
Nov-07	2149.5		724.6	2,196.8		
Dec-07	2334.2	25,900.6	1069.5	2,279.3	25,822.3	
Jan-08	2686.4		1113.8	2,656.7		
Feb-08	2431.2		954.6	2,354.4		
Mar-08	2399.6		734.7	2,432.3		
Apr-08	2179.9		517.3	2,174.1		
May-08	1731.6		307.9	1,737.9		
Jun-08	2141.2		225.6	2,104.5		
Jul-08	1932.2		173.4	1,898.9		
Aug-08	2012.7		187.7	2,000.3		
Sep-08	1908.7		318.7	1,908.1		
Oct-08	1813.0		563.0	1,800.1		
Nov-08	2145.5		782.5	2,160.0		
Dec-08	2587.0	25,969.1	1186.2	2,466.2	25,693.7	
Jan-09	2848.9		1137.9	2,805.7		
Feb-09	2219.1		955.4	2,141.9		
Mar-09	2744.6		868.5	2,701.7		
Apr-09	2094.5		515.2	2,089.9		
May-09	2045.3		331.2	2,038.4		
Jun-09	1977.4		144.1	1,986.8		
Jul-09	2155.9		62.5	2,185.3		
Aug-09	2044.5		158.3	2,048.8		
Sep-09	1831.1		306.1	1,837.6		
Oct-09	1959.4		541.8	1,958.5		
Nov-09	2436.6		781.5	2,451.7		
Dec-09	2241.6	26,599.0	955.2	2,251.4	26,497.6	
Jan-10	2783.9		991.1	2,823.6		
Feb-10	2107.6		679.2	2,186.5		
Mar-10	2359.1		656.0	2,436.3		
Apr-10	2230.4		461.2	2,256.3		
May-10	2099.5		292.0	2,114.8		
Jun-10	2141.4		171.9	2,135.1		
Jul-10	1956.4		117.3	1,954.8		
Aug-10	1855.5		146.2	1,866.6		
Sep-10	1981.7		332.4	1,973.4		
Oct-10	1911.8		520.4	1,923.0		
Nov-10	2447.8		717.6	2,499.0		
Dec-10	2282.4	26,157.5	1162.5	2,174.9	26,344.4	
Jan-11	3045.1		1010.2	3,074.1		
Feb-11	2506.2		905.6	2,457.1		
Mar-11	2764.1		901.7	2,702.4		
Apr-11	2355.3		511.2	2,352.9		
May-11	2134.3		296.4	2,147.2		
Jun-11	1996.2		161.0	1,996.0		
Jul-11	2065.2		127.8	2,057.7		
Aug-11	1922.8		217.9	1,893.4		
Sep-11	2053.9		328.5	2,047.8		
Nov-11	2279.9		513.3	2,295.1		
Nov-11	2428.4		931.7	2,358.6		
Dec-11	2811.6	28,363.0	775.1	2,923.1	28,305.2	
Jan-12	2709.0		1118.1	2,676.9		
Feb-12	2989.9		691.7	3,061.8		
Mar-12	2633.5		756.2	2,654.1		
Apr-12	2764.5		450.6	2,796.3		
May-12	1770.7		350.8	1,752.8		
Jun-12	2626.8		195.1	2,607.4		
Jul-12	2436.2		140.1	2,421.7		
Aug-12	1885.6		157.9	1,890.1		
Sep-12	2425.7		271.0	2,452.0		
Oct-12	1888.4		639.3	1,832.3		
Nov-12	2475.8		969.6	2,384.6		
Dec-12	2738.1	29,344.1	1196.8	2,611.2	29,141.2	

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Haines Junction

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	3,192.1		952.0	3,253.9		
Feb-13	2,742.1		665.4	2,828.8		
Mar-13	2,610.9		851.1	2,577.8		
Apr-13	2,527.0		639.9	2,451.8		
May-13	2,124.3		294.0	2,138.5		
Jun-13	2,505.9		112.4	2,533.2		
Jul-13	2,332.0		92.5	2,344.4		
Aug-13	1,818.5		98.9	1,856.3		
Sep-13	2,386.4		264.3	2,416.5		
Oct-13	2,082.8		501.4	2,104.7		
Nov-13	2,143.9		865.6	2,111.5		
Dec-13	2,971.7	29,437.5	1,144.7	2,874.3	29,491.8	
Jan-14	3,196.3		745.8	3,374.7		
Feb-14	2,653.6		992.4	2,555.4		
Mar-14	3,069.5		855.1	3,034.2		
Apr-14	2,393.2		499.8	2,397.2		
May-14	2,261.2		269.5	2,289.2		
Jun-14	2,157.7		200.5	2,135.1		
Jul-14	2,258.3		98.0	2,267.6		
Aug-14	2,183.3		144.0	2,195.7		
Sep-14	2,302.1		307.1	2,308.1		
Oct-14	2,082.4		515.6	2,096.3		
Nov-14	2,066.6		772.8	2,086.6		
Dec-14	3,084.0	29,708.1	854.4	3,150.7	29,890.9	
Jan-15	3,111.4		927.0	3,187.4		
Feb-15	3,051.3		851.4	3,032.9		
Mar-15	2,358.6		671.3	2,427.2		
Apr-15	2,821.3		453.5	2,851.5		
May-15	2,045.7		192.9	2,117.0		
Jun-15	2,121.3		127.2	2,140.2		
Jul-15	2,370.6		115.7	2,369.9		
Aug-15	2,221.6		183.2	2,211.8		
Sep-15	2,374.2		332.7	2,365.7		
Oct-15	2,129.0		469.8	2,168.8		
Nov-15	2,327.8		759.2	2,355.6		
Dec-15	2,981.6	29,914.2	947.9	2,995.4	30,223.2	
Jan-16	3,042.0		827.6	3,174.2		
Feb-16	2,877.6		688.0	2,951.6		
Mar-16	2,637.7		611.6	2,740.0		
Apr-16	2,844.0					
May-16	2,062.2					
Jun-16	2,138.4					
Jul-16	2,389.7					
Aug-16	2,239.5					
Sep-16	2,393.4					
Oct-16	2,146.1					
Nov-16	2,346.6					
Dec-16	3,005.6	30,122.8			30,431.3	
Jan-17	3,066.6					
Feb-17	2,900.8					
Mar-17	2,659.0					
Apr-17	2,867.0					
May-17	2,078.8					
Jun-17	2,155.6					
Jul-17	2,408.9					
Aug-17	2,257.6					
Sep-17	2,412.7					
Oct-17	2,163.4					
Nov-17	2,365.5					
Dec-17	3,029.8	30,365.7			30,365.7	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (29,914.2 / 29,437.5) ^ {1/2} - 1 = \mathbf{0.8\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Teslin

Commercial	Annual		(Whitehorse)	Annual	
	Actual / Forecast	UPC (kWh)		Normalized	Normalized
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)
Jan-95	2018.7		1020.1	2,067.3	
Feb-95	1751.5		840.1	1,726.5	
Mar-95	1962.8		880.0	1,859.7	
Apr-95	1497.1		439.9	1,576.2	
May-95	1497.2		250.7	1,577.8	
Jun-95	1424.2		139.0	1,449.7	
Jul-95	1619.6		96.6	1,640.7	
Aug-95	1365.8		198.3	1,327.5	
Sep-95	2344.1		226.5	2,451.5	
Oct-95	502.2		524.9	520.2	
Nov-95	1648.9		894.4	1,547.3	
Dec-95	1799.3	19,431.2	1048.6	1,709.5	19,453.9
Jan-96	2030.3		1556.4	1,446.7	
Feb-96	1902.0		835.8	1,882.0	
Mar-96	1641.4		805.8	1,625.8	
Apr-96	1556.7		526.0	1,534.3	
May-96	1258.0		357.3	1,212.9	
Jun-96	1596.3		193.6	1,557.5	
Jul-96	1446.2		124.9	1,433.9	
Aug-96	1729.4		227.3	1,657.0	
Sep-96	1320.3		362.6	1,267.2	
Oct-96	1151.7		679.9	987.0	
Nov-96	1756.1		975.0	1,559.5	
Dec-96	1810.4	19,198.8	1155.8	1,594.2	17,757.9
Jan-97	2356.2		1185.7	2,209.5	
Feb-97	1968.3		656.5	2,159.6	
Mar-97	1690.5		855.4	1,616.4	
Apr-97	1648.1		484.0	1,675.3	
May-97	1592.5		331.1	1,578.3	
Jun-97	1435.6		148.9	1,449.5	
Jul-97	1399.6		92.8	1,425.1	
Aug-97	1587.8		130.0	1,630.1	
Sep-97	1322.2		282.1	1,364.0	
Oct-97	1710.8		641.0	1,592.0	
Nov-97	1538.0		694.0	1,672.7	
Dec-97	1683.3	19,932.8	762.0	1,931.3	20,303.9
Jan-98	2597.5		1165.7	2,474.5	
Feb-98	1961.1		719.1	2,078.7	
Mar-98	1769.5		756.6	1,811.9	
Apr-98	1681.2		458.6	1,738.3	
May-98	1405.4		270.6	1,462.5	
Jun-98	1399.0		119.5	1,447.5	
Jul-98	1704.8		111.6	1,708.1	
Aug-98	1450.9		189.2	1,423.4	
Sep-98	1322.4		327.8	1,310.4	
Oct-98	1641.8		557.7	1,621.1	
Nov-98	1752.1		792.3	1,770.9	
Dec-98	2011.9	20,697.5	1051.8	1,918.3	20,765.6
Jan-99	2545.4		1183.1	2,401.8	
Feb-99	2176.1		976.4	1,990.4	
Mar-99	2093.6		734.0	2,162.6	
Apr-99	1764.9		508.8	1,762.7	
May-99	1363.5		391.9	1,277.6	
Jun-99	1551.9		153.9	1,559.9	
Jul-99	1621.0		108.6	1,628.0	
Aug-99	1394.1		145.7	1,417.8	
Sep-99	1386.2		311.2	1,393.8	
Oct-99	1480.4		499.8	1,528.0	
Nov-99	1780.7		792.5	1,799.2	
Dec-99	1836.5	20,994.2	844.0	1,987.9	20,909.8
Jan-00	2490.2		1082.9	2,464.8	
Feb-00	2115.2		735.2	2,213.8	
Mar-00	1741.3		659.2	1,898.6	
Apr-00	2033.4		515.6	2,023.3	
May-00	1274.0		382.0	1,199.8	
Jun-00	1726.2		172.5	1,712.3	
Jul-00	1346.3		142.1	1,313.8	
Aug-00	1418.9		219.9	1,355.2	
Sep-00	1537.4		354.2	1,494.3	
Oct-00	1369.2		539.2	1,370.4	
Nov-00	1858.4		691.2	1,996.4	
Dec-00	1970.3	20,880.9	977.8	1,964.0	21,006.4

Regression Output:								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.748921249							
R Square	0.560883037							
Adjusted R Square	0.558416088							
Standard Error	345.7581429							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	27180467.86	27180467.86	227.3589706	1.22872E-33			
Residual	178	21279667.42	119548.6934					
Total	179	48460135.27						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1477.031155	49.73759561	29.6964728	7.16266E-71	1378.879934	1575.182376	1378.879934	1575.182376
WH-HDD	1.178984071	0.078190122	15.07842732	1.22872E-33	1.024685179	1.333282964	1.024685179	1.333282964

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Teslin

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	1940.8		722.7	2,340.1		
Feb-01	2108.2		864.1	2,054.9		
Mar-01	2230.3		765.3	2,262.5		
Apr-01	1625.5		506.8	1,625.8		
May-01	1425.5		390.4	1,341.4		
Jun-01	1784.9		167.3	1,777.1		
Jul-01	1493.0		139.6	1,463.4		
Aug-01	1501.9		139.6	1,532.9		
Sep-01	1500.7		309.0	1,510.8		
Oct-01	1418.0		573.4	1,378.8		
Nov-01	1988.4		818.0	1,976.9		
Dec-01	1920.4	20,937.7	1094.6	1,776.4	21,040.9	
Jan-02	1954.0		935.6	2,102.3		
Feb-02	2472.0		824.6	2,465.1		
Mar-02	1963.3		921.1	1,811.8		
Apr-02	1780.4		653.3	1,607.9		
May-02	1740.4		361.6	1,690.3		
Jun-02	1515.6		175.6	1,498.0		
Jul-02	1665.2		130.9	1,645.9		
Aug-02	1785.8		182.8	1,765.8		
Sep-02	1437.8		314.4	1,441.5		
Oct-02	1486.9		444.3	1,600.0		
Nov-02	1932.6		582.6	2,198.6		
Dec-02	2087.0	21,821.1	845.2	2,237.0	22,064.3	
Jan-03	2591.6		989.1	2,676.8		
Feb-03	2226.6		756.6	2,300.0		
Mar-03	2088.6		834.5	2,039.2		
Apr-03	1829.5		514.3	1,820.9		
May-03	1716.5		363.7	1,663.9		
Jun-03	1571.2		192.8	1,533.3		
Jul-03	1683.3		84.4	1,718.8		
Aug-03	1411.8		180.6	1,394.4		
Sep-03	1732.8		359.2	1,683.7		
Oct-03	1337.0		466.7	1,423.7		
Nov-03	1769.5		874.6	1,691.3		
Dec-03	2275.6	22,234.0	911.6	2,347.3	22,293.2	
Jan-04	2535.3		1257.9	2,303.5		
Feb-04	2054.5		697.2	2,197.9		
Mar-04	2114.3		753.5	2,160.4		
Apr-04	1959.8		466.6	2,007.4		
May-04	1444.4		272.5	1,499.3		
Jun-04	1645.8		83.7	1,736.6		
Jul-04	1938.0		74.2	1,985.5		
Aug-04	1585.4		101.7	1,661.1		
Sep-04	1695.8		367.5	1,637.0		
Oct-04	1550.3		540.5	1,549.9		
Nov-04	1905.2		719.8	2,009.4		
Dec-04	1851.9	22,280.8	899.5	1,937.9	22,686.0	
Jan-05	2529.2		1165.8	2,406.0		
Feb-05	1877.9		795.2	1,905.8		
Mar-05	1860.7		613.7	2,071.6		
Apr-05	1717.7		453.3	1,781.0		
May-05	1568.7		256.6	1,642.3		
Jun-05	1675.6		154.4	1,683.1		
Jul-05	1857.4		132.6	1,836.0		
Aug-05	1615.8		150.8	1,633.5		
Sep-05	1975.2		299.3	1,996.8		
Oct-05	1594.0		534.6	1,600.6		
Nov-05	2105.1		762.6	2,158.9		
Dec-05	2037.8	22,415.1	794.4	2,247.7	22,963.4	
Jan-06	2803.9		1096.2	2,762.8		
Feb-06	2283.5		821.3	2,280.6		
Mar-06	2589.6		906.3	2,455.6		
Apr-06	1941.9		519.1	1,927.6		
May-06	1720.1		346.9	1,687.3		
Jun-06	2047.9		173.1	2,033.2		
Jul-06	1719.2		118.4	1,714.5		
Aug-06	1789.8		201.6	1,747.6		
Sep-06	1998.8		295.7	2,024.6		
Oct-06	1876.4		520.5	1,899.6		
Nov-06	2461.7		1162.2	2,044.4		
Dec-06	2641.2	25,873.9	824.3	2,815.8	25,393.7	

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Teslin

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	3211.0		912.0	3,387.1		
Feb-07	3048.7		998.8	2,836.5		
Mar-07	3285.3		954.2	3,094.8		
Apr-07	2446.5		511.9	2,440.7		
May-07	1636.9		322.1	1,633.4		
Jun-07	2050.6		140.5	2,074.4		
Jul-07	1629.3		102.3	1,643.7		
Aug-07	1452.5		154.2	1,466.2		
Sep-07	1857.5		308.4	1,868.3		
Oct-07	1731.8		543.7	1,727.7		
Nov-07	3035.0		724.6	3,133.6		
Dec-07	2369.5	27,754.6	1069.5	2,255.0	27,561.4	
Jan-08	3335.8		1113.8	3,273.9		
Feb-08	3330.5		954.6	3,170.4		
Mar-08	2238.4		734.7	2,306.7		
Apr-08	1881.4		517.3	1,869.3		
May-08	2172.0		307.9	2,185.2		
Jun-08	1552.5		225.6	1,475.9		
Jul-08	1685.4		173.4	1,615.9		
Aug-08	1922.7		187.7	1,897.0		
Sep-08	1603.9		318.7	1,602.7		
Oct-08	1775.2		563.0	1,748.3		
Nov-08	2696.7		782.5	2,727.1		
Dec-08	2807.1	27,001.6	1186.2	2,555.0	26,427.3	
Jan-09	3426.9		1137.9	3,336.6		
Feb-09	3387.7		955.4	3,226.7		
Mar-09	2858.0		868.5	2,768.5		
Apr-09	2590.7		515.2	2,581.0		
May-09	2053.9		331.2	2,039.6		
Jun-09	1594.4		144.1	1,613.9		
Jul-09	1916.9		62.5	1,978.2		
Aug-09	1724.4		158.3	1,733.3		
Sep-09	1777.2		306.1	1,790.8		
Oct-09	2270.6		541.8	2,268.7		
Nov-09	2665.3		781.5	2,696.8		
Dec-09	2701.3	28,967.3	955.2	2,721.6	28,755.8	
Jan-10	3376.7		991.1	3,459.5		
Feb-10	3157.8		679.2	3,322.4		
Mar-10	2908.2		656.0	3,069.3		
Apr-10	2789.9		461.2	2,843.9		
May-10	1718.1		292.0	1,750.0		
Jun-10	1724.8		171.9	1,711.6		
Jul-10	1761.7		117.3	1,758.3		
Aug-10	1562.4		146.2	1,585.6		
Sep-10	2153.3		332.4	2,135.9		
Oct-10	1694.9		520.4	1,718.2		
Nov-10	2184.0		717.6	2,290.8		
Dec-10	3047.5	28,079.2	1162.5	2,823.4	28,468.8	
Jan-11	3233.6		1010.2	3,293.9		
Feb-11	2530.1		905.6	2,427.8		
Mar-11	3011.2		904.4	2,879.4		
Apr-11	2175.9		511.2	2,170.9		
May-11	2127.1		296.4	2,153.8		
Jun-11	1634.6		161.0	1,634.2		
Jul-11	2014.7		127.8	1,999.0		
Aug-11	1662.3		218.3	1,600.5		
Sep-11	1949.5		328.6	1,936.6		
Nov-11	1843.5		513.4	1,875.2		
Nov-11	2364.0		936.1	2,213.2		
Dec-11	2498.9	27,045.4	774.4	2,732.4	26,916.9	
Jan-12	3171.4		1118.1	3,104.5		
Feb-12	2497.8		691.7	2,647.7		
Mar-12	2835.6		756.2	2,878.5		
Apr-12	2333.4		450.6	2,399.9		
May-12	1694.6		350.8	1,657.2		
Jun-12	1958.6		195.1	1,918.0		
Jul-12	1717.7		140.1	1,687.5		
Aug-12	1592.9		157.9	1,602.2		
Sep-12	1946.7		271.0	2,001.6		
Oct-12	1824.9		639.3	1,708.1		
Nov-12	2939.1		969.6	2,748.9		
Dec-12	2984.0	27,496.7	1196.8	2,719.4	27,073.5	

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Teslin

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	2,935.6		952.0	3,064.5		
Feb-13	3,120.6		665.4	3,301.5		
Mar-13	2,459.6		851.1	2,390.6		
Apr-13	2,295.5		639.9	2,138.8		
May-13	1,700.1		294.0	1,729.7		
Jun-13	2,023.1		112.4	2,080.0		
Jul-13	1,598.2		92.5	1,624.1		
Aug-13	1,832.3		98.9	1,911.3		
Sep-13	1,632.3		264.3	1,695.2		
Oct-13	1,594.1		501.4	1,639.8		
Nov-13	2,757.6		865.6	2,689.9		
Dec-13	2,796.5	26,745.5	1,144.7	2,593.4	26,858.8	
Jan-14	3,041.4		745.8	3,413.5		
Feb-14	2,563.2		992.4	2,358.5		
Mar-14	2,530.3		855.1	2,456.6		
Apr-14	2,098.3		499.8	2,106.8		
May-14	2,126.6		269.5	2,185.0		
Jun-14	1,657.1		200.5	1,610.1		
Jul-14	1,672.3		98.0	1,691.7		
Aug-14	1,922.9		144.0	1,948.6		
Sep-14	1,642.3		307.1	1,654.7		
Oct-14	2,158.8		515.6	2,187.8		
Nov-14	2,408.0		772.8	2,449.8		
Dec-14	2,728.6	26,549.7	854.4	2,867.7	26,930.9	
Jan-15	3,082.8		927.0	3,241.2		
Feb-15	2,490.2		851.4	2,451.8		
Mar-15	2,521.6		671.3	2,664.6		
Apr-15	2,004.9		453.5	2,068.0		
May-15	1,879.4		192.9	2,028.1		
Jun-15	1,680.0		127.2	1,719.5		
Jul-15	1,895.3		115.7	1,893.9		
Aug-15	1,640.7		183.2	1,620.2		
Sep-15	1,851.7		332.7	1,833.9		
Oct-15	2,130.2		469.8	2,213.2		
Nov-15	2,255.8		759.2	2,313.6		
Dec-15	2,689.6	26,122.2	947.9	2,718.5	26,766.5	
Jan-16	3,141.3		827.6	3,416.9		
Feb-16	2,588.1		688.0	2,742.4		
Mar-16	2,152.1		611.6	2,365.5		
Apr-16	1,981.4					
May-16	1,857.3					
Jun-16	1,660.3					
Jul-16	1,873.1					
Aug-16	1,621.4					
Sep-16	1,830.0					
Oct-16	2,105.2					
Nov-16	2,229.3					
Dec-16	2,658.1	25,697.7			26,340.9	
Jan-17	3,104.5					
Feb-17	2,557.8					
Mar-17	2,126.9					
Apr-17	1,958.2					
May-17	1,835.6					
Jun-17	1,640.9					
Jul-17	1,851.1					
Aug-17	1,602.4					
Sep-17	1,808.5					
Oct-17	2,080.5					
Nov-17	2,203.2					
Dec-17	2,626.9	25,396.5			25,396.5	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (26,122.2 / 26,745.5) ^ {1/2} - 1 = \textbf{-1.2\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Ross River

Commercial Monthly	Annual		(Whitehorse) MHDD	Annual		Regression Output:																																																		
	Actual / Forecast UPC (kWh)	Normalized UPC (kWh)		Normalized UPC (kWh)																																																				
Jan-95	2461.2		1020.1	2,500.2	SUMMARY OUTPUT Regression Statistics Multiple R0.696004925 R Square0.484422856 Adjusted R Square0.481526355 Standard Error323.7253728 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>17526873.47</td><td>17526873.47</td><td>167.244164</td><td>2.11403E-27</td></tr><tr><td>Residual</td><td>178</td><td>18654064.82</td><td>104798.117</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>36180938.29</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1694.4192</td><td>46.56816336</td><td>36.38578543</td><td>2.33811E-84</td><td>1602.522476</td><td>1786.315924</td><td>1602.522476</td><td>1786.315924</td></tr><tr><td>WH-HDD</td><td>0.94674212</td><td>0.073207607</td><td>12.93229152</td><td>2.11403E-27</td><td>0.802275627</td><td>1.091208614</td><td>0.802275627</td><td>1.091208614</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	17526873.47	17526873.47	167.244164	2.11403E-27	Residual	178	18654064.82	104798.117			Total	179	36180938.29					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1694.4192	46.56816336	36.38578543	2.33811E-84	1602.522476	1786.315924	1602.522476	1786.315924	WH-HDD	0.94674212	0.073207607	12.93229152	2.11403E-27	0.802275627	1.091208614	0.802275627	1.091208614
	df	SS	MS	F		Significance F																																																		
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	1694.4192	46.56816336	36.38578543	2.33811E-84		1602.522476	1786.315924	1602.522476	1786.315924																																															
WH-HDD	0.94674212	0.073207607	12.93229152	2.11403E-27		0.802275627	1.091208614	0.802275627	1.091208614																																															
Feb-95	1896.3		840.1	1,876.2																																																				
Mar-95	1802.3		880.0	1,719.5																																																				
Apr-95	2203.0		439.9	2,266.5																																																				
May-95	1392.0		250.7	1,456.8																																																				
Jun-95	1438.7		139.0	1,459.3																																																				
Jul-95	1160.7		96.6	1,177.6																																																				
Aug-95	1196.2		198.3	1,165.5																																																				
Sep-95	1426.3		226.5	1,512.5																																																				
Oct-95	1354.1		524.9	1,368.6																																																				
Nov-95	2023.1		894.4	1,941.5																																																				
Dec-95	1975.8	20,329.7	1048.6	1,903.7	20,347.9																																																			
Jan-96	2538.4		1556.4	2,069.7																																																				
Feb-96	2373.2		835.8	2,357.1																																																				
Mar-96	2097.1		805.8	2,084.6																																																				
Apr-96	2054.6		526.0	2,036.6																																																				
May-96	1667.3		357.3	1,631.1																																																				
Jun-96	1522.4		193.6	1,491.2																																																				
Jul-96	1568.2		124.9	1,558.4																																																				
Aug-96	1429.2		227.3	1,371.0																																																				
Sep-96	1897.6		362.6	1,855.0																																																				
Oct-96	1724.3		679.9	1,592.0																																																				
Nov-96	2089.8		975.0	1,931.9																																																				
Dec-96	2252.5	23,214.7	1155.8	2,078.9	22,057.6																																																			
Jan-97	2944.9		1185.7	2,827.2																																																				
Feb-97	2195.3		656.5	2,349.0																																																				
Mar-97	2227.0		855.4	2,167.6																																																				
Apr-97	2233.9		484.0	2,255.7																																																				
May-97	1654.8		331.1	1,643.4																																																				
Jun-97	1470.3		148.9	1,481.5																																																				
Jul-97	1408.3		92.8	1,428.8																																																				
Aug-97	1351.3		130.0	1,385.2																																																				
Sep-97	1727.6		282.1	1,761.3																																																				
Oct-97	1758.9		641.0	1,663.4																																																				
Nov-97	2252.8		694.0	2,360.9																																																				
Dec-97	2062.1	23,287.2	762.0	2,261.3	23,585.2																																																			
Jan-98	3069.3		1165.7	2,970.4																																																				
Feb-98	2374.9		719.1	2,469.3																																																				
Mar-98	2564.4		756.6	2,598.5																																																				
Apr-98	2107.4		458.6	2,153.3																																																				
May-98	1560.9		270.6	1,606.8																																																				
Jun-98	1514.3		119.5	1,553.2																																																				
Jul-98	1656.0		111.6	1,658.7																																																				
Aug-98	1406.8		189.2	1,384.7																																																				
Sep-98	1747.1		327.8	1,737.4																																																				
Oct-98	1916.5		557.7	1,899.9																																																				
Nov-98	1912.7		792.3	1,927.8																																																				
Dec-98	2635.8	24,466.0	1051.8	2,560.6	24,520.7																																																			
Jan-99	2576.1		1183.1	2,460.8																																																				
Feb-99	2458.1		976.4	2,309.0																																																				
Mar-99	2377.4		734.0	2,432.9																																																				
Apr-99	2207.0		508.8	2,205.3																																																				
May-99	1829.9		391.9	1,760.9																																																				
Jun-99	1478.3		153.9	1,484.7																																																				
Jul-99	1712.9		108.6	1,718.4																																																				
Aug-99	1347.7		145.7	1,366.8																																																				
Sep-99	1811.4		311.2	1,817.5																																																				
Oct-99	1301.5		499.8	1,339.7																																																				
Nov-99	1872.2		792.5	1,887.1																																																				
Dec-99	2276.2	23,248.7	844.0	2,397.8	23,181.0																																																			
Jan-00	2522.0		1082.9	2,501.6																																																				
Feb-00	2565.9		735.2	2,645.1																																																				
Mar-00	2167.3		659.2	2,293.6																																																				
Apr-00	2458.2		515.6	2,450.1																																																				
May-00	1567.8		382.0	1,508.2																																																				
Jun-00	2215.4		172.5	2,204.2																																																				
Jul-00	1534.0		142.1	1,507.9																																																				
Aug-00	1509.0		219.9	1,457.9																																																				
Sep-00	1934.0		354.2	1,899.3																																																				
Oct-00	1934.1		539.2	1,935.1																																																				
Nov-00	2005.5		691.2	2,116.3																																																				
Dec-00	2663.0	25,076.3	977.8	2,657.9	25,177.1																																																			

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Ross River

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2601.7		722.7	2,922.3		
Feb-01	2448.0		864.1	2,405.2		
Mar-01	2862.1		765.3	2,887.9		
Apr-01	2130.1		506.8	2,130.3		
May-01	2252.0		390.4	2,184.5		
Jun-01	2016.5		167.3	2,010.2		
Jul-01	1710.6		139.6	1,686.8		
Aug-01	1636.8		139.6	1,661.6		
Sep-01	1878.7		309.0	1,886.8		
Oct-01	1953.3		573.4	1,921.8		
Nov-01	2589.7		818.0	2,580.5		
Dec-01	2517.1	26,596.5	1094.6	2,401.4	26,679.3	
Jan-02	2618.8		935.6	2,737.8		
Feb-02	3016.6		824.6	3,011.1		
Mar-02	2539.2		921.1	2,417.5		
Apr-02	2473.0		653.3	2,334.5		
May-02	2292.0		361.6	2,251.7		
Jun-02	1875.3		175.6	1,861.2		
Jul-02	1742.3		130.9	1,726.8		
Aug-02	1986.3		182.8	1,970.2		
Sep-02	1669.6		314.4	1,672.7		
Oct-02	1969.0		444.3	2,059.8		
Nov-02	2556.6		582.6	2,770.2		
Dec-02	2260.3	26,999.1	845.2	2,380.8	27,194.4	
Jan-03	2835.7		989.1	2,904.1		
Feb-03	2711.7		756.6	2,770.7		
Mar-03	2495.4		834.5	2,455.7		
Apr-03	2145.3		514.3	2,138.3		
May-03	2250.1		363.7	2,207.9		
Jun-03	1900.0		192.8	1,869.5		
Jul-03	1861.9		84.4	1,890.4		
Aug-03	1714.1		180.6	1,700.1		
Sep-03	1663.5		359.2	1,624.1		
Oct-03	1740.7		466.7	1,810.2		
Nov-03	2539.9		874.6	2,477.1		
Dec-03	2347.6	26,205.7	911.6	2,405.2	26,253.3	
Jan-04	2863.6		1257.9	2,677.5		
Feb-04	2463.3		697.2	2,578.4		
Mar-04	2343.5		753.5	2,380.5		
Apr-04	2571.5		466.6	2,609.7		
May-04	1913.5		272.5	1,957.6		
Jun-04	1819.0		83.7	1,891.9		
Jul-04	2060.0		74.2	2,098.1		
Aug-04	1767.3		101.7	1,828.0		
Sep-04	1740.6		367.5	1,693.4		
Oct-04	1880.8		540.5	1,880.5		
Nov-04	1976.5		719.8	2,060.2		
Dec-04	2565.8	25,965.2	899.5	2,634.8	26,290.6	
Jan-05	3019.2		1165.8	2,920.3		
Feb-05	2519.5		795.2	2,541.8		
Mar-05	2225.3		613.7	2,394.7		
Apr-05	2506.9		453.3	2,557.8		
May-05	1844.8		256.6	1,903.9		
Jun-05	1657.6		154.4	1,663.6		
Jul-05	1951.9		132.6	1,934.7		
Aug-05	1711.8		150.8	1,726.1		
Sep-05	1929.7		299.3	1,947.0		
Oct-05	1595.7		534.6	1,601.0		
Nov-05	1897.8		762.6	1,941.0		
Dec-05	2444.7	25,304.9	794.4	2,613.2	25,745.1	
Jan-06	2708.4		1096.2	2,675.3		
Feb-06	2171.5		821.3	2,169.1		
Mar-06	2523.5		906.3	2,415.9		
Apr-06	2415.5		519.1	2,404.0		
May-06	1946.5		346.9	1,920.2		
Jun-06	1886.3		173.1	1,874.5		
Jul-06	1554.8		118.4	1,551.1		
Aug-06	1437.6		201.6	1,403.8		
Sep-06	1892.0		295.7	1,912.7		
Oct-06	1933.6		520.5	1,952.2		
Nov-06	2027.3		1162.2	1,692.2		
Dec-06	2742.1	25,239.0	824.3	2,882.4	24,853.4	

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Ross River

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	2301.3		912.0	2,442.7		
Feb-07	2205.6		998.8	2,035.2		
Mar-07	2840.2		954.2	2,687.2		
Apr-07	2334.5		511.9	2,329.8		
May-07	1808.6		322.1	1,805.7		
Jun-07	1946.7		140.5	1,965.8		
Jul-07	1618.9		102.3	1,630.4		
Aug-07	2209.8		154.2	2,220.8		
Sep-07	1085.8		308.4	1,094.5		
Oct-07	1928.0		543.7	1,924.7		
Nov-07	2353.5		724.6	2,432.6		
Dec-07	2157.8	24,790.6	1069.5	2,065.9	24,635.4	
Jan-08	2483.1		1113.8	2,433.5		
Feb-08	3194.1		954.6	3,065.6		
Mar-08	2438.4		734.7	2,493.2		
Apr-08	2114.8		517.3	2,105.1		
May-08	2315.9		307.9	2,326.4		
Jun-08	1757.1		225.6	1,695.6		
Jul-08	1547.6		173.4	1,491.8		
Aug-08	1823.7		187.7	1,803.0		
Sep-08	1844.5		318.7	1,843.4		
Oct-08	2042.0		563.0	2,020.5		
Nov-08	2101.2		782.5	2,125.6		
Dec-08	2725.3	26,387.7	1186.2	2,522.9	25,926.5	
Jan-09	3053.0		1137.9	2,980.6		
Feb-09	2047.9		955.4	1,918.6		
Mar-09	2591.7		868.5	2,519.8		
Apr-09	2200.6		515.2	2,192.8		
May-09	1956.6		331.2	1,945.1		
Jun-09	1678.4		144.1	1,694.1		
Jul-09	1630.6		62.5	1,679.8		
Aug-09	1935.1		158.3	1,942.3		
Sep-09	1097.0		306.1	1,107.9		
Oct-09	2178.2		541.8	2,176.7		
Nov-09	1916.2		781.5	1,941.5		
Dec-09	2618.8	24,904.1	955.2	2,635.1	24,734.3	
Jan-10	2992.8		991.1	3,059.3		
Feb-10	2409.4		679.2	2,541.6		
Mar-10	2501.9		656.0	2,631.3		
Apr-10	2507.4		461.2	2,550.8		
May-10	1770.2		292.0	1,795.8		
Jun-10	1892.6		171.9	1,882.0		
Jul-10	1925.5		117.3	1,922.8		
Aug-10	1860.8		146.2	1,879.5		
Sep-10	1795.9		332.4	1,781.9		
Oct-10	1945.8		520.4	1,964.6		
Nov-10	2103.1		717.6	2,188.9		
Dec-10	2681.9	26,387.4	1162.5	2,501.9	26,700.3	
Jan-11	2974.5		1010.2	3,022.9		
Feb-11	2538.0		905.6	2,455.9		
Mar-11	2331.4		904.4	2,225.5		
Apr-11	2422.3		511.2	2,418.4		
May-11	1779.6		296.4	1,801.1		
Jun-11	1674.4		161.0	1,674.1		
Jul-11	1836.2		127.8	1,823.6		
Aug-11	1722.8		218.3	1,673.2		
Sep-11	1779.0		328.6	1,768.6		
Nov-11	1743.2		513.4	1,768.7		
Nov-11	1900.6		936.1	1,779.6		
Dec-11	1992.6	24,694.7	774.4	2,180.1	24,591.5	
Jan-12	3734.0		1118.1	3,680.2		
Feb-12	2701.3		691.7	2,821.6		
Mar-12	2975.7		756.2	3,010.2		
Apr-12	2160.7		450.6	2,214.1		
May-12	2014.8		350.8	1,984.8		
Jun-12	2067.2		195.1	2,034.6		
Jul-12	1769.8		140.1	1,745.6		
Aug-12	1953.2		157.9	1,960.8		
Sep-12	1722.4		271.0	1,766.6		
Oct-12	2062.4		639.3	1,968.6		
Nov-12	2602.1		969.6	2,449.4		
Dec-12	2545.0	28,308.7	1196.8	2,332.5	27,968.9	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	2,515.6		952.0	2,619.2		
Feb-13	3,270.1		665.4	3,415.3		
Mar-13	2,454.6		851.1	2,399.2		
Apr-13	2,640.4		639.9	2,514.6		
May-13	2,290.4		294.0	2,314.2		
Jun-13	2,319.5		112.4	2,365.2		
Jul-13	1,923.8		92.5	1,944.6		
Aug-13	2,300.6		98.9	2,364.0		
Sep-13	1,599.0		264.3	1,649.4		
Oct-13	1,854.0		501.4	1,890.7		
Nov-13	2,684.1		865.6	2,629.8		
Dec-13	2,244.9	28,096.9	1,144.7	2,081.8	28,187.9	
Jan-14	3,380.5		745.8	3,679.2		
Feb-14	2,160.3		992.4	1,995.9		
Mar-14	2,961.8		855.1	2,902.6		
Apr-14	2,719.7		499.8	2,726.5		
May-14	2,361.6		269.5	2,408.6		
Jun-14	2,018.5		200.5	1,980.8		
Jul-14	1,901.3		98.0	1,916.9		
Aug-14	2,363.5		144.0	2,384.2		
Sep-14	1,574.4		307.1	1,584.3		
Oct-14	2,266.6		515.6	2,289.9		
Nov-14	2,842.4		772.8	2,875.9		
Dec-14	2,628.7	29,179.3	854.4	2,740.5	29,485.4	
Jan-15	3,214.4		927.0	3,341.6		
Feb-15	2,846.2		851.4	2,815.4		
Mar-15	2,570.3		671.3	2,685.1		
Apr-15	2,938.5		453.5	2,989.1		
May-15	2,530.8		192.9	2,650.2		
Jun-15	1,760.8		127.2	1,792.5		
Jul-15	1,488.7		115.7	1,487.5		
Aug-15	1,847.4		183.2	1,831.0		
Sep-15	1,958.7		332.7	1,944.5		
Oct-15	2,464.5		469.8	2,531.2		
Nov-15	2,265.0		759.2	2,311.5		
Dec-15	2,765.8	28,651.1	947.9	2,789.0	29,168.5	
Jan-16	3,375.8		827.6	3,597.1		
Feb-16	2,777.7		688.0	2,901.6		
Mar-16	2,697.0		611.6	2,868.3		
Apr-16	2,967.3					
May-16	2,555.6					
Jun-16	1,778.1					
Jul-16	1,503.3					
Aug-16	1,865.5					
Sep-16	1,978.0					
Oct-16	2,488.7					
Nov-16	2,287.3					
Dec-16	2,792.9	29,067.2			29,583.7	
Jan-17	3,408.9					
Feb-17	2,805.0					
Mar-17	2,723.4					
Apr-17	2,996.4					
May-17	2,580.7					
Jun-17	1,795.5					
Jul-17	1,518.1					
Aug-17	1,883.8					
Sep-17	1,997.4					
Oct-17	2,513.1					
Nov-17	2,309.7					
Dec-17	2,820.3	29,352.4			29,352.4	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (28,651.1 / 28,096.9) ^ {1/2} - 1 = \mathbf{1.0\%}$$

Note: January, February and March 2016 have been updated to include actuals.

ATCO Electric Yukon
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Pelly Crossing

Commercial	Annual		(Whitehorse)	Annual		Regression Output:																																																			
	Actual / Forecast	UPC (kWh)		Normalized	UPC (kWh)																																																				
Monthly	UPC (kWh)		MHDD	UPC (kWh)	UPC (kWh)																																																				
Jan-95	2258.1		1020.1	2,300.4		SUMMARY OUTPUT Regression Statistics Multiple R0.558281787 R Square0.311678554 Adjusted R Square0.307811158 Standard Error504.9499933 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>20550971.8</td><td>20550971.8</td><td>80.60010761</td><td>3.86827E-16</td></tr><tr><td>Residual</td><td>178</td><td>45385460.25</td><td>254974.4958</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>65936432.05</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>2076.672067</td><td>72.63747533</td><td>28.58954083</td><td>1.92953E-68</td><td>1933.330661</td><td>2220.013473</td><td>1933.330661</td><td>2220.013473</td></tr><tr><td>WH-HDD</td><td>1.025169449</td><td>0.11418994</td><td>8.977756268</td><td>3.86827E-16</td><td>0.799829204</td><td>1.250509694</td><td>0.799829204</td><td>1.250509694</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	20550971.8	20550971.8	80.60010761	3.86827E-16	Residual	178	45385460.25	254974.4958			Total	179	65936432.05					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	2076.672067	72.63747533	28.58954083	1.92953E-68	1933.330661	2220.013473	1933.330661	2220.013473	WH-HDD	1.025169449	0.11418994	8.977756268	3.86827E-16	0.799829204	1.250509694	0.799829204	1.250509694
	df	SS	MS	F	Significance F																																																				
Regression	1	20550971.8	20550971.8	80.60010761	3.86827E-16																																																				
Residual	178	45385460.25	254974.4958																																																						
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Intercept	2076.672067	72.63747533	28.58954083	1.92953E-68	1933.330661		2220.013473	1933.330661	2220.013473																																																
WH-HDD	1.025169449	0.11418994	8.977756268	3.86827E-16	0.799829204		1.250509694	0.799829204	1.250509694																																																
Feb-95	1866.5		840.1	1,844.7																																																					
Mar-95	1866.4		880.0	1,776.8																																																					
Apr-95	1500.9		439.9	1,569.7																																																					
May-95	1587.8		250.7	1,657.9																																																					
Jun-95	1126.2		139.0	1,148.4																																																					
Jul-95	1266.1		96.6	1,284.5																																																					
Aug-95	832.9		198.3	799.6																																																					
Sep-95	1356.1		226.5	1,449.5																																																					
Oct-95	1659.5		524.9	1,675.2																																																					
Nov-95	2139.1		894.4	2,050.8																																																					
Dec-95	2066.0	19,525.6	1048.6	1,987.9	19,545.2																																																				
Jan-96	2921.8		1556.4	2,414.3																																																					
Feb-96	2328.3		835.8	2,310.9																																																					
Mar-96	1987.4		805.8	1,973.9																																																					
Apr-96	1837.7		526.0	1,818.2																																																					
May-96	1470.2		357.3	1,431.0																																																					
Jun-96	1337.7		193.6	1,303.9																																																					
Jul-96	1461.8		124.9	1,451.1																																																					
Aug-96	162.5		227.3	99.5																																																					
Sep-96	1630.6		362.6	1,584.5																																																					
Oct-96	1596.1		679.9	1,452.9																																																					
Nov-96	2014.9		975.0	1,843.9																																																					
Dec-96	2082.7	20,831.6	1155.8	1,894.7	19,578.7																																																				
Jan-97	2355.6		1185.7	2,228.1																																																					
Feb-97	2007.2		656.5	2,173.6																																																					
Mar-97	1829.7		855.4	1,765.3																																																					
Apr-97	1768.1		484.0	1,791.7																																																					
May-97	1400.0		331.1	1,387.6																																																					
Jun-97	1338.5		148.9	1,350.6																																																					
Jul-97	1226.6		92.8	1,248.8																																																					
Aug-97	888.6		130.0	925.4																																																					
Sep-97	1480.8		282.1	1,517.2																																																					
Oct-97	1622.6		641.0	1,519.3																																																					
Nov-97	2055.1		694.0	2,172.2																																																					
Dec-97	2075.4	20,048.1	762.0	2,291.1	20,370.8																																																				
Jan-98	2544.0		1165.7	2,437.0																																																					
Feb-98	2317.7		719.1	2,419.9																																																					
Mar-98	2000.7		756.6	2,037.6																																																					
Apr-98	2114.0		458.6	2,163.6																																																					
May-98	2031.9		270.6	2,081.6																																																					
Jun-98	1305.0		119.5	1,347.2																																																					
Jul-98	1552.6		111.6	1,555.6																																																					
Aug-98	1414.7		189.2	1,390.8																																																					
Sep-98	1600.5		327.8	1,590.1																																																					
Oct-98	1962.2		557.7	1,944.3																																																					
Nov-98	1727.5		792.3	1,743.8																																																					
Dec-98	2027.8	22,598.5	1051.8	1,946.4	22,657.8																																																				
Jan-99	2861.4		1183.1	2,736.6																																																					
Feb-99	2388.1		976.4	2,226.6																																																					
Mar-99	1940.0		734.0	2,000.1																																																					
Apr-99	1889.1		508.8	1,887.3																																																					
May-99	1626.3		391.9	1,551.6																																																					
Jun-99	1465.8		153.9	1,472.8																																																					
Jul-99	1615.5		108.6	1,621.6																																																					
Aug-99	729.3		145.7	750.0																																																					
Sep-99	1921.2		311.2	1,927.8																																																					
Oct-99	1320.1		499.8	1,361.5																																																					
Nov-99	1586.3		792.5	1,602.5																																																					
Dec-99	2388.4	21,731.6	844.0	2,520.1	21,658.2																																																				
Jan-00	1870.7		1082.9	1,848.6																																																					
Feb-00	2245.1		735.2	2,330.9																																																					
Mar-00	1931.1		659.2	2,067.9																																																					
Apr-00	2081.0		515.6	2,072.2																																																					
May-00	1497.1		382.0	1,432.6																																																					
Jun-00	1616.4		172.5	1,604.3																																																					
Jul-00	1509.8		142.1	1,481.5																																																					
Aug-00	1584.7		219.9	1,529.3																																																					
Sep-00	2177.0		354.2	2,139.5																																																					
Oct-00	2098.8		539.2	2,099.8																																																					
Nov-00	2858.4		691.2	2,978.4																																																					
Dec-00	2094.0	23,564.3	977.8	2,088.5	23,673.5																																																				

ATCO Electric Yukon
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Pelly Crossing

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2838.3		722.7	3,185.4		
Feb-01	2531.9		864.1	2,485.5		
Mar-01	2962.8		765.3	2,990.8		
Apr-01	1970.9		506.8	1,971.1		
May-01	1988.8		390.4	1,915.7		
Jun-01	2161.0		167.3	2,154.2		
Jul-01	1456.8		139.6	1,431.0		
Aug-01	1441.2		139.6	1,468.1		
Sep-01	1952.2		309.0	1,961.0		
Oct-01	1898.1		573.4	1,864.0		
Nov-01	2662.8		818.0	2,652.8		
Dec-01	2136.7	26,001.4	1094.6	2,011.5	26,091.1	
Jan-02	2829.8		935.6	2,958.7		
Feb-02	3264.0		824.6	3,258.0		
Mar-02	2496.0		921.1	2,364.3		
Apr-02	2345.1		653.3	2,195.1		
May-02	2329.1		361.6	2,285.5		
Jun-02	1822.0		175.6	1,806.7		
Jul-02	1335.1		130.9	1,318.2		
Aug-02	1907.0		182.8	1,889.6		
Sep-02	1616.9		314.4	1,620.2		
Oct-02	2054.2		444.3	2,152.5		
Nov-02	2092.5		582.6	2,323.8		
Dec-02	2461.9	26,553.5	845.2	2,592.3	26,764.9	
Jan-03	2563.8		989.1	2,637.9		
Feb-03	2473.0		756.6	2,536.8		
Mar-03	2705.2		834.5	2,662.2		
Apr-03	2639.1		514.3	2,631.6		
May-03	2336.2		363.7	2,290.4		
Jun-03	1800.1		192.8	1,767.1		
Jul-03	2121.4		84.4	2,152.3		
Aug-03	2174.3		180.6	2,159.2		
Sep-03	2127.5		359.2	2,084.9		
Oct-03	2383.4		466.7	2,458.8		
Nov-03	2287.5		874.6	2,219.5		
Dec-03	2936.2	28,547.7	911.6	2,998.5	28,599.2	
Jan-04	2676.4		1257.9	2,474.9		
Feb-04	2888.3		697.2	3,013.0		
Mar-04	2654.1		753.5	2,694.2		
Apr-04	2702.6		466.6	2,744.0		
May-04	2069.7		272.5	2,117.4		
Jun-04	2299.6		83.7	2,378.5		
Jul-04	2167.1		74.2	2,208.4		
Aug-04	1815.9		101.7	1,881.7		
Sep-04	2462.4		367.5	2,411.3		
Oct-04	2509.0		540.5	2,508.7		
Nov-04	2491.0		719.8	2,581.7		
Dec-04	2761.8	29,497.9	899.5	2,836.6	29,850.2	
Jan-05	3520.5		1165.8	3,413.4		
Feb-05	2901.5		795.2	2,925.7		
Mar-05	2479.6		613.7	2,663.0		
Apr-05	2773.2		453.3	2,828.2		
May-05	1994.3		256.6	2,058.3		
Jun-05	2299.1		154.4	2,305.5		
Jul-05	1765.2		132.6	1,746.6		
Aug-05	1816.1		150.8	1,831.6		
Sep-05	2200.1		299.3	2,218.9		
Oct-05	2019.6		534.6	2,025.4		
Nov-05	2527.4		762.6	2,574.2		
Dec-05	2697.1	28,993.8	794.4	2,879.6	29,470.5	
Jan-06	2533.0		1096.2	2,497.3		
Feb-06	3057.7		821.3	3,055.1		
Mar-06	3186.1		906.3	3,069.6		
Apr-06	2286.2		519.1	2,273.8		
May-06	2164.0		346.9	2,135.5		
Jun-06	2351.1		173.1	2,338.3		
Jul-06	1904.9		118.4	1,900.9		
Aug-06	1537.0		201.6	1,500.3		
Sep-06	2287.2		295.7	2,309.6		
Oct-06	2245.9		520.5	2,266.1		
Nov-06	2690.8		1162.2	2,327.9		
Dec-06	2672.8	28,916.7	824.3	2,824.6	28,499.1	

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Pelly Crossing

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	3776.4		912.0	3,929.5		
Feb-07	2742.8		998.8	2,558.3		
Mar-07	3240.2		954.2	3,074.5		
Apr-07	2481.2		511.9	2,476.2		
May-07	2243.5		322.1	2,240.4		
Jun-07	2304.6		140.5	2,325.3		
Jul-07	1643.0		102.3	1,655.5		
Aug-07	2246.1		154.2	2,258.0		
Sep-07	2279.4		308.4	2,288.9		
Oct-07	2005.3		543.7	2,001.8		
Nov-07	2909.8		724.6	2,995.6		
Dec-07	2062.6	29,935.1	1069.5	1,963.1	29,767.0	
Jan-08	3131.4		1113.8	3,077.7		
Feb-08	3728.9		954.6	3,589.7		
Mar-08	2820.8		734.7	2,880.2		
Apr-08	2044.3		517.3	2,033.8		
May-08	2501.8		307.9	2,513.2		
Jun-08	2020.8		225.6	1,954.2		
Jul-08	1497.0		173.4	1,436.6		
Aug-08	2015.6		187.7	1,993.2		
Sep-08	2176.3		318.7	2,175.2		
Oct-08	2990.1		563.0	2,966.7		
Nov-08	2723.0		782.5	2,749.4		
Dec-08	2463.2	30,113.3	1186.2	2,244.1	29,613.9	
Jan-09	2948.7		1137.9	2,870.2		
Feb-09	2262.2		955.4	2,122.2		
Mar-09	3840.2		868.5	3,762.4		
Apr-09	2940.2		515.2	2,931.8		
May-09	4370.2		331.2	4,357.7		
Jun-09	2278.0		144.1	2,295.0		
Jul-09	2390.5		62.5	2,443.8		
Aug-09	1897.8		158.3	1,905.6		
Sep-09	2502.7		306.1	2,514.5		
Oct-09	2531.4		541.8	2,529.7		
Nov-09	2923.5		781.5	2,951.0		
Dec-09	2663.3	33,548.7	955.2	2,680.9	33,364.8	
Jan-10	3641.4		991.1	3,713.4		
Feb-10	2837.2		679.2	2,980.3		
Mar-10	2806.8		656.0	2,946.8		
Apr-10	2912.4		461.2	2,959.3		
May-10	2396.5		292.0	2,424.3		
Jun-10	2344.2		171.9	2,332.7		
Jul-10	2439.1		117.3	2,436.2		
Aug-10	2193.4		146.2	2,213.6		
Sep-10	2521.8		332.4	2,506.6		
Oct-10	3114.7		520.4	3,135.0		
Nov-10	4461.5		717.6	4,554.4		
Dec-10	2097.3	33,766.2	1162.5	1,902.5	34,105.1	
Jan-11	4468.1		1010.2	4,520.5		
Feb-11	3478.4		905.6	3,389.5		
Mar-11	3674.5		904.4	3,559.8		
Apr-11	3201.3		511.2	3,197.0		
May-11	3486.8		296.4	3,510.0		
Jun-11	2315.6		161.0	2,315.3		
Jul-11	2684.7		127.8	2,671.0		
Aug-11	2341.4		218.3	2,287.6		
Sep-11	2833.2		328.6	2,822.0		
Nov-11	2515.8		513.4	2,543.3		
Nov-11	3327.6		936.1	3,196.5		
Dec-11	2942.1	37,269.6	774.4	3,145.2	37,157.8	
Jan-12	4226.1		1118.1	4,167.9		
Feb-12	3159.0		691.7	3,289.3		
Mar-12	3632.1		756.2	3,669.4		
Apr-12	2853.8		450.6	2,911.6		
May-12	2587.5		350.8	2,555.0		
Jun-12	2874.5		195.1	2,839.3		
Jul-12	2142.2		140.1	2,116.0		
Aug-12	2423.0		157.9	2,431.2		
Sep-12	2357.4		271.0	2,405.2		
Oct-12	2736.6		639.3	2,635.0		
Nov-12	4274.1		969.6	4,108.7		
Dec-12	3143.3	36,409.7	1196.8	2,913.3	36,041.7	

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Pelly Crossing

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast UPC (kWh)	(Whitehorse) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-13	3,754.3		952.0	3,866.3		
Feb-13	3,099.0		665.4	3,256.3		
Mar-13	3,471.9		851.1	3,411.9		
Apr-13	3,529.6		639.9	3,393.4		
May-13	3,227.7		294.0	3,253.4		
Jun-13	2,231.5		112.4	2,281.0		
Jul-13	2,381.5		92.5	2,404.0		
Aug-13	2,619.9		98.9	2,688.5		
Sep-13	2,288.9		264.3	2,343.5		
Oct-13	3,366.7		501.4	3,406.4		
Nov-13	2,890.6		865.6	2,831.8		
Dec-13	2,376.0	35,237.6	1,144.7	2,199.4	35,336.1	
Jan-14	4,282.9		745.8	4,606.4		
Feb-14	3,335.3		992.4	3,157.3		
Mar-14	3,028.9		855.1	2,964.8		
Apr-14	2,752.8		499.8	2,760.2		
May-14	2,665.4		269.5	2,716.2		
Jun-14	2,325.8		200.5	2,284.9		
Jul-14	2,327.6		98.0	2,344.5		
Aug-14	2,103.8		144.0	2,126.2		
Sep-14	2,434.6		307.1	2,445.4		
Oct-14	3,153.4		515.6	3,178.6		
Nov-14	2,926.3		772.8	2,962.6		
Dec-14	3,933.6	35,270.4	854.4	4,054.6	35,601.8	
Jan-15	3,237.5		927.0	3,375.2		
Feb-15	3,137.1		851.4	3,103.7		
Mar-15	2,860.1		671.3	2,984.4		
Apr-15	3,287.5		453.5	3,342.3		
May-15	2,545.6		192.9	2,675.0		
Jun-15	2,348.6		127.2	2,382.9		
Jul-15	2,811.1		115.7	2,809.9		
Aug-15	2,235.2		183.2	2,217.5		
Sep-15	2,671.8		332.7	2,656.3		
Oct-15	2,956.5		469.8	3,028.6		
Nov-15	2,782.0		759.2	2,832.3		
Dec-15	3,262.4	34,135.5	947.9	3,287.6	34,695.7	
Jan-16	3,213.3		827.6	3,452.9		
Feb-16	2,808.9		688.0	2,943.1		
Mar-16	2,794.6		611.6	2,980.2		
Apr-16	3,235.6					
May-16	2,505.5					
Jun-16	2,311.6					
Jul-16	2,766.8					
Aug-16	2,200.0					
Sep-16	2,629.7					
Oct-16	2,909.9					
Nov-16	2,738.2					
Dec-16	3,211.0	33,325.1			33,884.4	
Jan-17	3,162.6					
Feb-17	2,764.7					
Mar-17	2,750.6					
Apr-17	3,184.6					
May-17	2,466.0					
Jun-17	2,275.2					
Jul-17	2,723.2					
Aug-17	2,165.3					
Sep-17	2,588.2					
Oct-17	2,864.0					
Nov-17	2,695.0					
Dec-17	3,160.4	32,799.8			32,799.8	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (34,135.5 / 35,237.6) ^ {(1/2)} - 1 = \textbf{-1.6\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Old Crow

Commercial Monthly	Annual Actual / Forecast		(Whitehorse) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	Regression Output:																																																			
	UPC (kWh)	UPC (kWh)																																																							
Jan-95	1979.0		1020.1	2,005.1		SUMMARY OUTPUT Regression Statistics Multiple R0.63131021 R Square0.398552581 Adjusted R Square0.395173663 Standard Error257.6000895 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>7827083.781</td><td>7827083.781</td><td>117.9527208</td><td>2.09363E-21</td></tr><tr><td>Residual</td><td>178</td><td>11811689.49</td><td>66357.80614</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>19638773.27</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1427.337778</td><td>37.05598653</td><td>38.51841259</td><td>2.87988E-88</td><td>1354.212202</td><td>1500.463354</td><td>1354.212202</td><td>1500.463354</td></tr><tr><td>WH-HDD</td><td>0.632673239</td><td>0.058253964</td><td>10.86060407</td><td>2.09363E-21</td><td>0.51771598</td><td>0.747630498</td><td>0.51771598</td><td>0.747630498</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	7827083.781	7827083.781	117.9527208	2.09363E-21	Residual	178	11811689.49	66357.80614			Total	179	19638773.27					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1427.337778	37.05598653	38.51841259	2.87988E-88	1354.212202	1500.463354	1354.212202	1500.463354	WH-HDD	0.632673239	0.058253964	10.86060407	2.09363E-21	0.51771598	0.747630498	0.51771598	0.747630498
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WH-HDD	0.632673239	0.058253964	10.86060407	2.09363E-21	0.51771598		0.747630498	0.51771598	0.747630498																																																
Feb-95	2207.5		840.1	2,194.1																																																					
Mar-95	1820.3		880.0	1,765.0																																																					
Apr-95	1886.2		439.9	1,928.6																																																					
May-95	2133.9		250.7	2,177.1																																																					
Jun-95	1590.3		139.0	1,604.0																																																					
Jul-95	1232.2		96.6	1,243.5																																																					
Aug-95	1126.6		198.3	1,106.1																																																					
Sep-95	1544.5		226.5	1,602.2																																																					
Oct-95	1589.8		524.9	1,599.4																																																					
Nov-95	2039.2		894.4	1,984.6																																																					
Dec-95	2188.9	21,338.3	1048.6	2,140.7	21,350.4																																																				
Jan-96	2651.2		1556.4	2,338.0																																																					
Feb-96	2214.0		835.8	2,203.3																																																					
Mar-96	1858.0		805.8	1,849.7																																																					
Apr-96	2124.1		526.0	2,112.1																																																					
May-96	1803.3		357.3	1,779.1																																																					
Jun-96	1168.2		193.6	1,147.4																																																					
Jul-96	1311.0		124.9	1,304.4																																																					
Aug-96	1085.3		227.3	1,046.5																																																					
Sep-96	2020.5		362.6	1,992.0																																																					
Oct-96	930.2		679.9	841.8																																																					
Nov-96	2006.3		975.0	1,900.8																																																					
Dec-96	2210.6	21,382.8	1155.8	2,094.6	20,609.7																																																				
Jan-97	2576.0		1185.7	2,497.3																																																					
Feb-97	1748.7		656.5	1,851.4																																																					
Mar-97	1643.8		855.4	1,604.1																																																					
Apr-97	1975.4		484.0	1,990.0																																																					
May-97	1338.0		331.1	1,330.4																																																					
Jun-97	1291.2		148.9	1,298.7																																																					
Jul-97	1166.7		92.8	1,180.4																																																					
Aug-97	1199.3		130.0	1,221.9																																																					
Sep-97	1280.4		282.1	1,302.9																																																					
Oct-97	1284.5		641.0	1,220.8																																																					
Nov-97	1621.7		694.0	1,694.0																																																					
Dec-97	2244.1	19,370.0	762.0	2,377.2	19,569.2																																																				
Jan-98	1511.5		1165.7	1,445.5																																																					
Feb-98	1682.9		719.1	1,746.0																																																					
Mar-98	2011.6		756.6	2,034.4																																																					
Apr-98	1387.5		458.6	1,418.1																																																					
May-98	1473.8		270.6	1,504.4																																																					
Jun-98	1098.3		119.5	1,124.3																																																					
Jul-98	245.3		111.6	247.2																																																					
Aug-98	1201.9		189.2	1,187.1																																																					
Sep-98	921.4		327.8	914.9																																																					
Oct-98	1211.4		557.7	1,200.3																																																					
Nov-98	1440.7		792.3	1,450.8																																																					
Dec-98	1798.6	15,985.0	1051.8	1,748.4	16,021.6																																																				
Jan-99	1650.7		1183.1	1,573.7																																																					
Feb-99	1582.3		976.4	1,482.6																																																					
Mar-99	1824.2		734.0	1,861.3																																																					
Apr-99	2076.3		508.8	2,075.2																																																					
May-99	1430.4		391.9	1,384.3																																																					
Jun-99	1351.7		153.9	1,356.0																																																					
Jul-99	1472.6		108.6	1,476.3																																																					
Aug-99	992.9		145.7	1,005.7																																																					
Sep-99	1185.3		311.2	1,189.3																																																					
Oct-99	1621.0		499.8	1,646.5																																																					
Nov-99	1399.6		792.5	1,409.6																																																					
Dec-99	1537.6	18,124.7	844.0	1,618.9	18,079.4																																																				
Jan-00	2030.7		1082.9	2,017.0																																																					
Feb-00	1618.6		735.2	1,671.5																																																					
Mar-00	1768.6		659.2	1,853.0																																																					
Apr-00	1818.6		515.6	1,813.1																																																					
May-00	1641.2		382.0	1,601.4																																																					
Jun-00	1661.3		172.5	1,653.8																																																					
Jul-00	1247.8		142.1	1,230.3																																																					
Aug-00	1316.5		219.9	1,282.3																																																					
Sep-00	1301.9		354.2	1,278.8																																																					
Oct-00	1775.6		539.2	1,776.3																																																					
Nov-00	1562.7		691.2	1,636.7																																																					
Dec-00	2119.8	19,863.2	977.8	2,116.4	19,930.6																																																				

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Old Crow

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast UPC (kWh)	(Whitehorse) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-01	1898.9		722.7	2,113.1		
Feb-01	1835.3		864.1	1,806.7		
Mar-01	2125.7		765.3	2,142.9		
Apr-01	1877.6		506.8	1,877.7		
May-01	1669.2		390.4	1,624.1		
Jun-01	1839.9		167.3	1,835.7		
Jul-01	1278.2		139.6	1,262.3		
Aug-01	1170.1		139.6	1,186.7		
Sep-01	1593.6		309.0	1,599.0		
Oct-01	1363.1		573.4	1,342.0		
Nov-01	1738.4		818.0	1,732.3		
Dec-01	1796.1	20,186.0	1094.6	1,718.8	20,241.3	
Jan-02	1900.8		935.6	1,980.4		
Feb-02	2239.7		824.6	2,236.0		
Mar-02	1871.0		921.1	1,789.7		
Apr-02	1644.2		653.3	1,551.6		
May-02	1843.0		361.6	1,816.1		
Jun-02	1352.3		175.6	1,342.9		
Jul-02	1310.8		130.9	1,300.4		
Aug-02	1516.4		182.8	1,505.7		
Sep-02	1550.9		314.4	1,552.9		
Oct-02	1510.7		444.3	1,571.3		
Nov-02	2003.6		582.6	2,146.3		
Dec-02	1780.0	20,523.4	845.2	1,860.5	20,654.0	
Jan-03	2198.0		989.1	2,243.7		
Feb-03	1997.8		756.6	2,037.1		
Mar-03	1998.2		834.5	1,971.6		
Apr-03	1886.8		514.3	1,882.2		
May-03	1879.8		363.7	1,851.6		
Jun-03	1556.2		192.8	1,535.8		
Jul-03	1485.4		84.4	1,504.4		
Aug-03	1284.6		180.6	1,275.3		
Sep-03	1338.9		359.2	1,312.6		
Oct-03	1460.0		466.7	1,506.5		
Nov-03	1826.9		874.6	1,785.0		
Dec-03	1884.8	20,797.5	911.6	1,923.3	20,829.2	
Jan-04	2048.0		1257.9	1,923.7		
Feb-04	1868.3		697.2	1,945.2		
Mar-04	2062.3		753.5	2,087.0		
Apr-04	1867.6		466.6	1,893.2		
May-04	1980.2		272.5	2,009.7		
Jun-04	1655.1		83.7	1,703.8		
Jul-04	1454.5		74.2	1,480.0		
Aug-04	1246.3		101.7	1,286.9		
Sep-04	1230.2		367.5	1,198.7		
Oct-04	1918.1		540.5	1,917.9		
Nov-04	1769.3		719.8	1,825.3		
Dec-04	1796.8	20,896.8	899.5	1,842.9	21,114.2	
Jan-05	2392.1		1165.8	2,326.0		
Feb-05	1982.5		795.2	1,997.5		
Mar-05	2152.5		613.7	2,265.7		
Apr-05	2260.9		453.3	2,294.9		
May-05	1750.2		256.6	1,789.7		
Jun-05	1588.4		154.4	1,592.3		
Jul-05	1480.6		132.6	1,469.2		
Aug-05	1302.4		150.8	1,311.9		
Sep-05	1199.5		299.3	1,211.1		
Oct-05	1818.9		534.6	1,822.4		
Nov-05	1900.6		762.6	1,929.5		
Dec-05	2095.8	21,924.4	794.4	2,208.5	22,218.6	
Jan-06	2609.0		1096.2	2,587.0		
Feb-06	2111.1		821.3	2,109.5		
Mar-06	1971.4		906.3	1,899.4		
Apr-06	2176.7		519.1	2,169.0		
May-06	1746.9		346.9	1,729.3		
Jun-06	1757.9		173.1	1,750.0		
Jul-06	1281.1		118.4	1,278.6		
Aug-06	1250.3		201.6	1,227.6		
Sep-06	1717.5		295.7	1,731.3		
Oct-06	1496.5		520.5	1,508.9		
Nov-06	1551.5		1162.2	1,327.6		
Dec-06	2104.5	21,774.3	824.3	2,198.2	21,516.6	

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Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast UPC (kWh)	(Whitehorse) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-07	1939.1		912.0	2,033.6		
Feb-07	1860.5		998.8	1,746.6		
Mar-07	2235.0		954.2	2,132.8		
Apr-07	1910.8		511.9	1,907.7		
May-07	1703.4		322.1	1,701.4		
Jun-07	1804.4		140.5	1,817.2		
Jul-07	1531.4		102.3	1,539.1		
Aug-07	1330.0		154.2	1,337.4		
Sep-07	1489.9		308.4	1,495.7		
Oct-07	1513.1		543.7	1,510.9		
Nov-07	2030.9		724.6	2,083.9		
Dec-07	1838.9	21,187.4	1069.5	1,777.5	21,083.7	
Jan-08	1863.0		1113.8	1,829.8		
Feb-08	2291.8		954.6	2,205.9		
Mar-08	1866.8		734.7	1,903.4		
Apr-08	1694.7		517.3	1,688.2		
May-08	1789.2		307.9	1,796.2		
Jun-08	1714.6		225.6	1,673.5		
Jul-08	1187.5		173.4	1,150.2		
Aug-08	1663.7		187.7	1,649.9		
Sep-08	1337.6		318.7	1,336.9		
Oct-08	1290.1		563.0	1,275.6		
Nov-08	2155.0		782.5	2,171.3		
Dec-08	1968.6	20,822.5	1186.2	1,833.4	20,514.4	
Jan-09	2456.8		1137.9	2,408.3		
Feb-09	1824.2		955.4	1,737.8		
Mar-09	2146.2		868.5	2,098.1		
Apr-09	2057.2		515.2	2,052.0		
May-09	1872.5		331.2	1,864.9		
Jun-09	1461.4		144.1	1,471.9		
Jul-09	1834.6		62.5	1,867.5		
Aug-09	1305.2		158.3	1,310.0		
Sep-09	1276.1		306.1	1,283.3		
Oct-09	1911.4		541.8	1,910.4		
Nov-09	1739.8		781.5	1,756.7		
Dec-09	1972.8	21,858.2	955.2	1,983.7	21,744.7	
Jan-10	2356.8		991.1	2,401.3		
Feb-10	1854.9		679.2	1,943.3		
Mar-10	1862.1		656.0	1,948.5		
Apr-10	2298.9		461.2	2,327.9		
May-10	1535.6		292.0	1,552.8		
Jun-10	1553.3		171.9	1,546.2		
Jul-10	1359.7		117.3	1,357.9		
Aug-10	1187.8		146.2	1,200.2		
Sep-10	1183.8		332.4	1,174.4		
Oct-10	1490.0		520.4	1,502.5		
Nov-10	1651.1		717.6	1,708.5		
Dec-10	1700.0	20,034.0	1162.5	1,579.7	20,243.1	
Jan-11	2185.7		1010.2	2,218.0		
Feb-11	1996.9		905.6	1,941.9		
Mar-11	1828.1		904.4	1,757.3		
Apr-11	1837.4		511.2	1,834.8		
May-11	1817.5		296.4	1,831.8		
Jun-11	1551.8		161.0	1,551.5		
Jul-11	1539.5		127.8	1,531.1		
Aug-11	1378.8		218.3	1,345.6		
Sep-11	1535.5		328.6	1,528.5		
Nov-11	1480.5		513.4	1,497.5		
Nov-11	1720.6		936.1	1,639.7		
Dec-11	2067.6	20,939.7	774.4	2,192.9	20,870.7	
Jan-12	2045.6		1118.1	2,009.6		
Feb-12	1843.7		691.7	1,924.1		
Mar-12	2410.8		756.2	2,433.8		
Apr-12	2014.1		450.6	2,049.7		
May-12	1627.6		350.8	1,607.6		
Jun-12	1808.4		195.1	1,786.7		
Jul-12	1275.8		140.1	1,259.6		
Aug-12	1738.4		157.9	1,743.4		
Sep-12	1259.5		271.0	1,289.0		
Oct-12	1621.8		639.3	1,559.1		
Nov-12	1591.4		969.6	1,489.3		
Dec-12	2716.5	21,953.5	1196.8	2,574.6	21,726.4	

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Commercial Monthly	Annual Actual / Forecast		(Whitehorse)	Normalized	Normalized	Regression Output:
	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	2,211.6		952.0	2,280.8		
Feb-13	2,681.5		665.4	2,778.6		
Mar-13	1,742.7		851.1	1,705.7		
Apr-13	1,927.2		639.9	1,843.1		
May-13	1,789.1		294.0	1,805.0		
Jun-13	1,923.2		112.4	1,953.7		
Jul-13	1,523.1		92.5	1,537.0		
Aug-13	1,476.1		98.9	1,518.5		
Sep-13	1,782.8		264.3	1,816.5		
Oct-13	1,501.1		501.4	1,525.6		
Nov-13	1,804.0		865.6	1,767.7		
Dec-13	2,055.6	22,417.9	1,144.7	1,946.6	22,478.7	
Jan-14	2,443.9		745.8	2,643.6		
Feb-14	1,885.9		992.4	1,776.1		
Mar-14	2,352.5		855.1	2,313.0		
Apr-14	1,980.1		499.8	1,984.6		
May-14	2,079.8		269.5	2,111.2		
Jun-14	1,461.1		200.5	1,435.9		
Jul-14	2,128.2		98.0	2,138.6		
Aug-14	1,127.9		144.0	1,141.7		
Sep-14	1,277.9		307.1	1,284.5		
Oct-14	1,715.1		515.6	1,730.6		
Nov-14	1,813.6		772.8	1,836.0		
Dec-14	1,687.8	21,953.8	854.4	1,762.5	22,158.3	
Jan-15	2,552.7		927.0	2,637.7		
Feb-15	1,857.0		851.4	1,836.4		
Mar-15	2,044.5		671.3	2,121.2		
Apr-15	2,002.7		453.5	2,036.5		
May-15	1,573.3		192.9	1,653.1		
Jun-15	1,417.5		127.2	1,438.7		
Jul-15	1,733.8		115.7	1,733.1		
Aug-15	1,307.3		183.2	1,296.4		
Sep-15	1,863.3		332.7	1,853.8		
Oct-15	1,331.0		469.8	1,375.5		
Nov-15	1,730.8		759.2	1,761.8		
Dec-15	2,196.0	21,609.9	947.9	2,211.5	21,955.6	
Jan-16	2,531.5		827.6	2,679.4		2 year Compound Annual Growth Rate = = (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 = = (21,609.9 / 22,417.9) ^ (1/2) - 1 = -1.8%
Feb-16	2,136.8		688.0	2,219.6		
Mar-16	2,258.0		611.6	2,372.6		
Apr-16	1,966.2					
May-16	1,544.7					
Jun-16	1,391.7					
Jul-16	1,702.3					
Aug-16	1,283.6					
Sep-16	1,829.5					
Oct-16	1,306.7					
Nov-16	1,699.3					
Dec-16	2,156.0	21,806.3			22,151.6	
Jan-17	2,485.4					
Feb-17	2,097.9					
Mar-17	2,217.0					
Apr-17	1,930.5					
May-17	1,516.6					
Jun-17	1,366.4					
Jul-17	1,671.3					
Aug-17	1,260.2					
Sep-17	1,796.2					
Oct-17	1,283.0					
Nov-17	1,668.4					
Dec-17	2,116.8	21,409.7			21,409.7	

Note: January, February and March 2016 have been updated to include actuals.

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Destruction Bay

Commercial	Annual		(Whitehorse)	Annual	
	Actual / Forecast	UPC (kWh)		Normalized	UPC (kWh)
Monthly	UPC (kWh)		MHDD		
Jan-95	1706.8		1020.1	1,718.9	
Feb-95	1152.2		840.1	1,146.0	
Mar-95	1417.7		880.0	1,392.1	
Apr-95	1136.5		439.9	1,156.1	
May-95	1237.3		250.7	1,257.3	
Jun-95	1258.1		139.0	1,264.5	
Jul-95	1286.0		96.6	1,291.2	
Aug-95	1558.3		198.3	1,548.8	
Sep-95	1294.1		226.5	1,320.8	
Oct-95	1211.3		524.9	1,215.8	
Nov-95	1153.0		894.4	1,127.8	
Dec-95	1311.6	15,722.9	1048.6	1,289.3	15,728.6
Jan-96	1533.6		1556.4	1,388.6	
Feb-96	1358.8		835.8	1,353.8	
Mar-96	1295.5		805.8	1,291.7	
Apr-96	1352.7		526.0	1,347.1	
May-96	1051.7		357.3	1,040.5	
Jun-96	1277.3		193.6	1,267.6	
Jul-96	1131.6		124.9	1,128.5	
Aug-96	1407.3		227.3	1,389.3	
Sep-96	1329.9		362.6	1,316.7	
Oct-96	1163.3		679.9	1,122.4	
Nov-96	1279.7		975.0	1,230.8	
Dec-96	1338.7	15,520.1	1155.8	1,285.0	15,162.2
Jan-97	1738.4		1185.7	1,702.0	
Feb-97	1296.7		656.5	1,344.3	
Mar-97	1297.2		855.4	1,278.8	
Apr-97	1292.9		484.0	1,299.6	
May-97	1143.5		331.1	1,140.0	
Jun-97	1143.2		148.9	1,146.7	
Jul-97	1436.0		92.8	1,442.4	
Aug-97	1239.2		130.0	1,249.7	
Sep-97	1567.2		282.1	1,577.6	
Oct-97	1230.3		641.0	1,200.8	
Nov-97	1404.1		694.0	1,437.6	
Dec-97	1199.5	15,988.2	762.0	1,261.1	16,080.4
Jan-98	1620.8		1165.7	1,590.2	
Feb-98	1469.6		719.1	1,498.8	
Mar-98	1594.2		756.6	1,604.8	
Apr-98	1295.8		458.6	1,309.9	
May-98	1076.8		270.6	1,091.0	
Jun-98	1435.1		119.5	1,447.2	
Jul-98	1319.8		111.6	1,320.6	
Aug-98	1581.0		189.2	1,574.1	
Sep-98	1470.8		327.8	1,467.8	
Oct-98	1281.1		557.7	1,275.9	
Nov-98	1572.7		792.3	1,577.4	
Dec-98	1394.0	17,111.6	1051.8	1,370.8	17,128.5
Jan-99	1823.6		1183.1	1,787.9	
Feb-99	1734.1		976.4	1,687.9	
Mar-99	1775.0		734.0	1,792.2	
Apr-99	1479.9		508.8	1,479.4	
May-99	1392.0		391.9	1,370.6	
Jun-99	1498.7		153.9	1,500.7	
Jul-99	1808.6		108.6	1,810.3	
Aug-99	1441.3		145.7	1,447.2	
Sep-99	1467.3		311.2	1,469.2	
Oct-99	1325.2		499.8	1,337.1	
Nov-99	1491.9		792.5	1,496.5	
Dec-99	1705.8	18,943.3	844.0	1,743.4	18,922.3
Jan-00	2075.0		1082.9	2,068.7	
Feb-00	1401.1		735.2	1,425.6	
Mar-00	1487.7		659.2	1,526.8	
Apr-00	1364.3		515.6	1,361.7	
May-00	1432.6		382.0	1,414.1	
Jun-00	1416.4		172.5	1,413.0	
Jul-00	1624.9		142.1	1,616.8	
Aug-00	1526.4		219.9	1,510.5	
Sep-00	1563.1		354.2	1,552.4	
Oct-00	1394.0		539.2	1,394.3	
Nov-00	1500.0		691.2	1,534.3	
Dec-00	1499.4	18,284.8	977.8	1,497.8	18,316.0

Regression Output:								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.315057045							
R Square	0.099260942							
Adjusted R Square	0.09420061							
Standard Error	292.4571587							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	1677737.114	1677737.114	19.61550073	1.64957E-05			
Residual	178	15224551.77	85531.18969					
Total	179	16902288.88						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1394.074102	42.07020484	33.13685084	4.715E-78	1311.053564	1477.094641	1311.053564	1477.094641
WH-HDD	0.292914877	0.06613658	4.428939007	1.64957E-05	0.162402215	0.423427539	0.162402215	0.423427539

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Destruction Bay

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	1690.8		722.7	1,789.9		
Feb-01	1472.7		864.1	1,459.5		
Mar-01	1421.7		765.3	1,429.7		
Apr-01	1238.6		506.8	1,238.6		
May-01	1410.7		390.4	1,389.9		
Jun-01	1519.4		167.3	1,517.5		
Jul-01	1339.4		139.6	1,332.1		
Aug-01	1297.7		139.6	1,305.4		
Sep-01	1606.4		309.0	1,609.0		
Oct-01	1721.2		573.4	1,711.5		
Nov-01	1413.1		818.0	1,410.2		
Dec-01	1480.4	17,612.3	1094.6	1,444.7	17,637.9	
Jan-02	1761.9		935.6	1,798.7		
Feb-02	1482.3		824.6	1,480.6		
Mar-02	1483.9		921.1	1,446.3		
Apr-02	2262.6		653.3	2,219.7		
May-02	1947.8		361.6	1,935.3		
Jun-02	1761.0		175.6	1,756.7		
Jul-02	2115.7		130.9	2,110.9		
Aug-02	2019.4		182.8	2,014.4		
Sep-02	2366.3		314.4	2,367.2		
Oct-02	2413.1		444.3	2,441.2		
Nov-02	2287.7		582.6	2,353.8		
Dec-02	1360.7	23,262.4	845.2	1,398.0	23,322.8	
Jan-03	1666.9		989.1	1,688.1		
Feb-03	1429.8		756.6	1,448.0		
Mar-03	1560.0		834.5	1,547.8		
Apr-03	1985.0		514.3	1,982.9		
May-03	2051.2		363.7	2,038.1		
Jun-03	2106.4		192.8	2,097.0		
Jul-03	1878.1		84.4	1,886.9		
Aug-03	1712.5		180.6	1,708.2		
Sep-03	1529.3		359.2	1,517.1		
Oct-03	1355.0		466.7	1,376.5		
Nov-03	1550.5		874.6	1,531.1		
Dec-03	1618.6	20,443.2	911.6	1,636.4	20,457.9	
Jan-04	1591.9		1257.9	1,534.3		
Feb-04	1563.6		697.2	1,599.2		
Mar-04	1468.3		753.5	1,479.8		
Apr-04	1544.1		466.6	1,555.9		
May-04	1070.3		272.5	1,083.9		
Jun-04	1458.0		83.7	1,480.6		
Jul-04	1692.4		74.2	1,704.2		
Aug-04	1829.0		101.7	1,847.8		
Sep-04	2083.1		367.5	2,068.5		
Oct-04	2061.8		540.5	2,061.7		
Nov-04	1434.1		719.8	1,460.1		
Dec-04	1555.1	19,351.8	899.5	1,576.4	19,452.5	
Jan-05	1506.4		1165.8	1,475.8		
Feb-05	1254.8		795.2	1,261.7		
Mar-05	1263.5		613.7	1,315.9		
Apr-05	1911.5		453.3	1,927.3		
May-05	1323.4		256.6	1,341.7		
Jun-05	1180.7		154.4	1,182.6		
Jul-05	1250.7		132.6	1,245.4		
Aug-05	1579.5		150.8	1,583.9		
Sep-05	1309.7		299.3	1,315.1		
Oct-05	1223.4		534.6	1,225.0		
Nov-05	1359.4		762.6	1,372.8		
Dec-05	1557.2	16,720.2	794.4	1,609.3	16,856.4	
Jan-06	1749.2		1096.2	1,739.0		
Feb-06	1429.8		821.3	1,429.0		
Mar-06	1567.6		906.3	1,534.3		
Apr-06	1381.7		519.1	1,378.2		
May-06	1494.6		346.9	1,486.4		
Jun-06	1145.8		173.1	1,142.2		
Jul-06	1328.8		118.4	1,327.6		
Aug-06	1544.4		201.6	1,533.9		
Sep-06	2438.5		295.7	2,444.9		
Oct-06	265.3		520.5	271.1		
Nov-06	1834.4		1162.2	1,730.7		
Dec-06	1981.1	18,161.2	824.3	2,024.5	18,041.9	

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Destruction Bay

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	1892.4		912.0	1,936.2		
Feb-07	1669.6		998.8	1,616.9		
Mar-07	1781.6		954.2	1,734.3		
Apr-07	1712.8		511.9	1,711.3		
May-07	1107.6		322.1	1,106.7		
Jun-07	1468.6		140.5	1,474.5		
Jul-07	1294.1		102.3	1,297.7		
Aug-07	1357.5		154.2	1,361.0		
Sep-07	1463.9		308.4	1,466.6		
Oct-07	1398.7		543.7	1,397.7		
Nov-07	1582.2		724.6	1,606.7		
Dec-07	1664.8	18,393.9	1069.5	1,636.4	18,345.9	
Jan-08	2016.6		1113.8	2,001.2		
Feb-08	1766.1		954.6	1,726.3		
Mar-08	1748.7		734.7	1,765.6		
Apr-08	1659.3		517.3	1,656.3		
May-08	1431.3		307.9	1,434.6		
Jun-08	1691.8		225.6	1,672.8		
Jul-08	1343.9		173.4	1,326.7		
Aug-08	1637.3		187.7	1,630.9		
Sep-08	1500.8		318.7	1,500.5		
Oct-08	1250.0		563.0	1,243.3		
Nov-08	1714.7		782.5	1,722.3		
Dec-08	1666.4	19,426.8	1186.2	1,603.8	19,284.1	
Jan-09	2135.4		1137.9	2,113.0		
Feb-09	1994.9		955.4	1,954.8		
Mar-09	1436.8		868.5	1,414.6		
Apr-09	1827.7		515.2	1,825.3		
May-09	1091.8		331.2	1,088.3		
Jun-09	1318.2		144.1	1,323.1		
Jul-09	1321.4		62.5	1,336.6		
Aug-09	1251.0		158.3	1,253.3		
Sep-09	1357.3		306.1	1,360.6		
Oct-09	1126.8		541.8	1,126.3		
Nov-09	1352.6		781.5	1,360.4		
Dec-09	1446.4	17,660.2	955.2	1,451.4	17,607.7	
Jan-10	1964.1		991.1	1,984.6		
Feb-10	1501.4		679.2	1,542.3		
Mar-10	1408.8		656.0	1,448.8		
Apr-10	1659.1		461.2	1,672.5		
May-10	1179.3		292.0	1,187.2		
Jun-10	1292.0		171.9	1,288.7		
Jul-10	1346.8		117.3	1,346.0		
Aug-10	1245.9		146.2	1,251.6		
Sep-10	1455.0		332.4	1,450.6		
Oct-10	1234.4		520.4	1,240.2		
Nov-10	1331.5		717.6	1,358.1		
Dec-10	1497.8	17,116.0	1162.5	1,442.1	17,212.8	
Jan-11	1919.0		1010.2	1,934.0		
Feb-11	1600.9		905.6	1,575.5		
Mar-11	1675.1		904.4	1,642.4		
Apr-11	1711.6		511.2	1,710.4		
May-11	1550.8		296.4	1,557.4		
Jun-11	1307.2		161.0	1,307.1		
Jul-11	1162.2		127.8	1,158.3		
Aug-11	1207.9		218.3	1,192.6		
Sep-11	1430.7		328.6	1,427.4		
Nov-11	1270.1		513.4	1,277.9		
Nov-11	1423.9		936.1	1,386.4		
Dec-11	1638.0	17,897.4	774.4	1,696.1	17,865.5	
Jan-12	2395.4		1118.1	2,378.8		
Feb-12	1742.6		691.7	1,779.9		
Mar-12	1803.1		756.2	1,813.8		
Apr-12	1513.4		450.6	1,529.9		
May-12	1237.0		350.8	1,227.7		
Jun-12	1312.3		195.1	1,302.2		
Jul-12	1196.1		140.1	1,188.6		
Aug-12	1429.3		157.9	1,431.6		
Sep-12	1568.8		271.0	1,582.5		
Oct-12	1406.4		639.3	1,377.4		
Nov-12	1500.5		969.6	1,453.2		
Dec-12	1700.9	18,806.0	1196.8	1,635.2	18,700.9	

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Destruction Bay

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	2,272.4		952.0	2,304.5		
Feb-13	1,946.7		665.4	1,991.6		
Mar-13	1,558.8		851.1	1,541.7		
Apr-13	1,759.7		639.9	1,720.8		
May-13	1,301.9		294.0	1,309.3		
Jun-13	1,462.2		112.4	1,476.3		
Jul-13	1,406.6		92.5	1,413.0		
Aug-13	1,333.9		98.9	1,353.6		
Sep-13	1,427.5		264.3	1,443.2		
Oct-13	1,102.3		501.4	1,113.7		
Nov-13	1,470.4		865.6	1,453.6		
Dec-13	1,690.9	18,733.4	1,144.7	1,640.5	18,761.5	
Jan-14	1,895.9		745.8	1,988.3		
Feb-14	1,608.1		992.4	1,557.3		
Mar-14	1,649.2		855.1	1,630.9		
Apr-14	1,443.2		499.8	1,445.3		
May-14	1,425.4		269.5	1,439.9		
Jun-14	1,196.2		200.5	1,184.6		
Jul-14	1,309.0		98.0	1,313.8		
Aug-14	1,378.9		144.0	1,385.3		
Sep-14	1,477.3		307.1	1,480.4		
Oct-14	1,181.2		515.6	1,188.4		
Nov-14	1,513.4		772.8	1,523.7		
Dec-14	1,665.0	17,742.7	854.4	1,699.6	17,837.4	
Jan-15	2,007.4		927.0	2,046.7		
Feb-15	1,900.1		851.4	1,890.6		
Mar-15	1,472.7		671.3	1,508.3		
Apr-15	1,717.7		453.5	1,733.4		
May-15	1,287.4		192.9	1,324.4		
Jun-15	1,212.2		127.2	1,222.0		
Jul-15	1,423.0		115.7	1,422.7		
Aug-15	1,097.4		183.2	1,092.3		
Sep-15	1,659.5		332.7	1,655.1		
Oct-15	1,053.9		469.8	1,074.6		
Nov-15	1,594.0		759.2	1,608.3		
Dec-15	1,865.9	18,291.3	947.9	1,873.1	18,451.4	
Jan-16	1,878.0		827.6	1,946.5		
Feb-16	1,604.5		688.0	1,642.8		
Mar-16	1,636.7		611.6	1,689.7		
Apr-16	1,697.3					
May-16	1,272.1					
Jun-16	1,197.8					
Jul-16	1,406.2					
Aug-16	1,084.3					
Sep-16	1,639.8					
Oct-16	1,041.4					
Nov-16	1,575.0					
Dec-16	1,843.8	17,877.1			18,036.9	
Jan-17	1,855.8					
Feb-17	1,585.5					
Mar-17	1,617.3					
Apr-17	1,677.2					
May-17	1,257.0					
Jun-17	1,183.6					
Jul-17	1,389.5					
Aug-17	1,071.5					
Sep-17	1,620.3					
Oct-17	1,029.1					
Nov-17	1,556.3					
Dec-17	1,821.9	17,664.9			17,664.9	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (18,291.3 / 18,733.4) ^ {1/2} - 1 = \mathbf{-1.2\%}$$

Note: January, February and March 2016 have been updated to include actuals.

Section 2
Attachment 29

Beaver Creek

Annual		Annual			
Commercial	Actual / Forecast	(Whitehorse)	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	UPC (kWh)	UPC (kWh)	
Jan-95	1711.2		1020.1	1,713.2	
Feb-95	1495.5		840.1	1,494.5	
Mar-95	1451.6		880.0	1,447.4	
Apr-95	1773.8		439.9	1,777.0	
May-95	1075.7		250.7	1,079.0	
Jun-95	2385.4		139.0	2,386.5	
Jul-95	2815.4		96.6	2,816.3	
Aug-95	2978.1		198.3	2,976.5	
Sep-95	2690.7		226.5	2,695.1	
Oct-95	1758.5		524.9	1,759.2	
Nov-95	2636.3		894.4	2,632.1	
Dec-95	2035.0	24,807.1	1048.6	2,031.3	24,808.1
Jan-96	2445.7		1556.4	2,421.8	
Feb-96	1851.8		835.8	1,851.0	
Mar-96	1707.3		805.8	1,706.7	
Apr-96	1260.4		526.0	1,259.4	
May-96	2002.3		357.3	2,000.5	
Jun-96	2436.4		193.6	2,434.8	
Jul-96	2579.2		124.9	2,578.7	
Aug-96	3072.0		227.3	3,069.1	
Sep-96	2644.8		362.6	2,642.6	
Oct-96	1592.4		679.9	1,585.7	
Nov-96	2294.3		975.0	2,286.2	
Dec-96	2370.8	26,257.4	1155.8	2,362.0	26,198.3
Jan-97	2505.1		1185.7	2,499.1	
Feb-97	1900.2		656.5	1,908.0	
Mar-97	1642.8		855.4	1,639.8	
Apr-97	1716.0		484.0	1,717.1	
May-97	2320.1		331.1	2,319.5	
Jun-97	1996.7		148.9	1,997.3	
Jul-97	2513.8		92.8	2,514.9	
Aug-97	2372.3		130.0	2,374.0	
Sep-97	2313.1		282.1	2,314.8	
Oct-97	1639.4		641.0	1,634.5	
Nov-97	1620.4		694.0	1,625.9	
Dec-97	2045.0	24,585.0	762.0	2,055.2	24,600.2
Jan-98	2338.9		1165.7	2,333.8	
Feb-98	2098.4		719.1	2,103.2	
Mar-98	1672.5		756.6	1,674.2	
Apr-98	1786.9		458.6	1,789.2	
May-98	1488.3		270.6	1,490.7	
Jun-98	2473.9		119.5	2,475.8	
Jul-98	2206.6		111.6	2,206.7	
Aug-98	2112.8		189.2	2,111.7	
Sep-98	2530.4		327.8	2,529.9	
Oct-98	1610.2		557.7	1,609.3	
Nov-98	2094.3		792.3	2,095.1	
Dec-98	2029.9	24,443.0	1051.8	2,026.0	24,445.8
Jan-99	2657.9		1183.1	2,652.0	
Feb-99	1837.2		976.4	1,829.5	
Mar-99	2089.9		734.0	2,092.8	
Apr-99	1657.7		508.8	1,657.6	
May-99	1423.9		391.9	1,420.4	
Jun-99	2676.5		153.9	2,676.8	
Jul-99	2822.6		108.6	2,822.9	
Aug-99	1843.3		145.7	1,844.3	
Sep-99	2288.2		311.2	2,288.5	
Oct-99	1521.1		499.8	1,523.1	
Nov-99	1839.2		792.5	1,840.0	
Dec-99	3007.7	25,665.2	844.0	3,013.9	25,661.7
Jan-00	1501.7		1082.9	1,500.7	
Feb-00	2145.3		735.2	2,149.3	
Mar-00	1907.6		659.2	1,914.0	
Apr-00	857.4		515.6	857.0	
May-00	1954.7		382.0	1,951.6	
Jun-00	2302.4		172.5	2,301.8	
Jul-00	2625.4		142.1	2,624.0	
Aug-00	2422.0		219.9	2,419.3	
Sep-00	2601.0		354.2	2,599.3	
Oct-00	1751.2		539.2	1,751.2	
Nov-00	1828.6		691.2	1,834.2	
Dec-00	2030.5	23,927.7	977.8	2,030.3	23,932.8

Regression Output:								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.041281381							
R Square	0.001704152							
Adjusted R Square	-0.003904251							
Standard Error	387.5736604							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	45643.3675	45643.3675	0.303856947	0.58216577			
Residual	178	26737974.92	150213.3422					
Total	179	26783618.28						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2038.619988	55.75279249	36.56534313	1.07888E-84	1928.598493	2148.641483	1928.598493	2148.641483
WH-HDD	0.048313479	0.087646328	0.551232207	0.58216577	-0.12464611	0.221273069	-0.12464611	0.221273069

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2156.9		722.7	2,173.2		
Feb-01	1857.0		864.1	1,854.8		
Mar-01	1905.2		765.3	1,906.5		
Apr-01	1572.5		506.8	1,572.5		
May-01	1976.5		390.4	1,973.0		
Jun-01	2330.2		167.3	2,329.9		
Jul-01	2562.7		139.6	2,561.5		
Aug-01	2563.1		139.6	2,564.3		
Sep-01	2064.0		309.0	2,064.4		
Oct-01	1464.1		573.4	1,462.5		
Nov-01	1841.4		818.0	1,840.9		
Dec-01	2160.7	24,454.1	1094.6	2,154.8	24,458.3	
Jan-02	2258.6		935.6	2,264.6		
Feb-02	2202.0		824.6	2,201.7		
Mar-02	2033.0		921.1	2,026.7		
Apr-02	2144.3		653.3	2,137.3		
May-02	1807.8		361.6	1,805.7		
Jun-02	2207.2		175.6	2,206.5		
Jul-02	2505.0		130.9	2,504.2		
Aug-02	2470.2		182.8	2,469.4		
Sep-02	1826.4		314.4	1,826.5		
Oct-02	1561.4		444.3	1,566.0		
Nov-02	1931.6		582.6	1,942.5		
Dec-02	1619.6	24,567.1	845.2	1,625.8	24,577.0	
Jan-03	2782.5		989.1	2,786.0		
Feb-03	2254.5		756.6	2,257.5		
Mar-03	1997.4		834.5	1,995.4		
Apr-03	1867.1		514.3	1,866.8		
May-03	1879.6		363.7	1,877.4		
Jun-03	2227.9		192.8	2,226.3		
Jul-03	2701.8		84.4	2,703.2		
Aug-03	2464.3		180.6	2,463.6		
Sep-03	2053.4		359.2	2,051.4		
Oct-03	1536.9		466.7	1,540.4		
Nov-03	2166.8		874.6	2,163.6		
Dec-03	2325.8	26,257.9	911.6	2,328.8	26,260.3	
Jan-04	2684.3		1257.9	2,674.8		
Feb-04	2309.3		697.2	2,315.2		
Mar-04	2217.1		753.5	2,219.0		
Apr-04	2063.9		466.6	2,065.9		
May-04	1617.5		272.5	1,619.7		
Jun-04	2297.0		83.7	2,300.8		
Jul-04	2538.3		74.2	2,540.2		
Aug-04	2473.5		101.7	2,476.6		
Sep-04	2326.3		367.5	2,323.9		
Oct-04	1845.1		540.5	1,845.1		
Nov-04	2195.8		719.8	2,200.1		
Dec-04	2599.6	27,167.7	899.5	2,603.1	27,184.3	
Jan-05	2746.0		1165.8	2,741.0		
Feb-05	2524.4		795.2	2,525.5		
Mar-05	1343.8		613.7	1,352.4		
Apr-05	1742.4		453.3	1,745.0		
May-05	1582.2		256.6	1,585.2		
Jun-05	2361.5		154.4	2,361.8		
Jul-05	2407.2		132.6	2,406.3		
Aug-05	2518.0		150.8	2,518.7		
Sep-05	2449.2		299.3	2,450.1		
Oct-05	1626.5		534.6	1,626.7		
Nov-05	2179.4		762.6	2,181.6		
Dec-05	2234.9	25,715.4	794.4	2,243.5	25,737.9	
Jan-06	2484.7		1096.2	2,483.0		
Feb-06	2314.9		821.3	2,314.8		
Mar-06	3194.0		906.3	3,188.5		
Apr-06	1114.0		519.1	1,113.4		
May-06	1577.2		346.9	1,575.9		
Jun-06	2225.1		173.1	2,224.5		
Jul-06	2210.7		118.4	2,210.5		
Aug-06	2416.0		201.6	2,414.3		
Sep-06	2173.6		295.7	2,174.7		
Oct-06	1560.0		520.5	1,561.0		
Nov-06	1840.4		1162.2	1,823.3		
Dec-06	2493.0	25,603.6	824.3	2,500.1	25,583.9	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	2613.5		912.0	2,620.7		
Feb-07	2225.4		998.8	2,216.7		
Mar-07	2629.7		954.2	2,621.9		
Apr-07	1749.6		511.9	1,749.3		
May-07	1568.6		322.1	1,568.5		
Jun-07	2504.0		140.5	2,505.0		
Jul-07	2452.7		102.3	2,453.3		
Aug-07	2483.0		154.2	2,483.6		
Sep-07	1445.6		308.4	1,446.0		
Oct-07	1895.3		543.7	1,895.1		
Nov-07	1965.3		724.6	1,969.4		
Dec-07	2024.6	25,557.3	1069.5	2,019.9	25,549.4	
Jan-08	2030.9		1113.8	2,028.3		
Feb-08	3031.2		954.6	3,024.6		
Mar-08	863.8		734.7	866.6		
Apr-08	1538.3		517.3	1,537.8		
May-08	2239.8		307.9	2,240.3		
Jun-08	1506.4		225.6	1,503.2		
Jul-08	2240.8		173.4	2,237.9		
Aug-08	2601.5		187.7	2,600.5		
Sep-08	1805.1		318.7	1,805.0		
Oct-08	1432.1		563.0	1,431.0		
Nov-08	1979.4		782.5	1,980.7		
Dec-08	2023.8	23,293.0	1186.2	2,013.5	23,269.5	
Jan-09	2447.9		1137.9	2,444.2		
Feb-09	2099.5		955.4	2,092.9		
Mar-09	2016.6		868.5	2,013.0		
Apr-09	1783.4		515.2	1,783.0		
May-09	1510.5		331.2	1,509.9		
Jun-09	1825.5		144.1	1,826.3		
Jul-09	2529.8		62.5	2,532.3		
Aug-09	2097.5		158.3	2,097.9		
Sep-09	2029.4		306.1	2,029.9		
Oct-09	2239.6		541.8	2,239.5		
Nov-09	946.0		781.5	947.3		
Dec-09	1882.8	23,408.6	955.2	1,883.6	23,399.9	
Jan-10	2554.4		991.1	2,557.8		
Feb-10	2126.6		679.2	2,133.4		
Mar-10	2008.7		656.0	2,015.3		
Apr-10	1742.9		461.2	1,745.1		
May-10	1796.8		292.0	1,798.1		
Jun-10	2117.5		171.9	2,116.9		
Jul-10	2415.8		117.3	2,415.6		
Aug-10	2367.0		146.2	2,368.0		
Sep-10	1748.8		332.4	1,748.1		
Oct-10	1813.8		520.4	1,814.7		
Nov-10	1818.0		717.6	1,822.4		
Dec-10	1838.7	24,348.9	1162.5	1,829.5	24,364.9	
Jan-11	2702.3		1010.2	2,704.8		
Feb-11	1952.0		905.6	1,947.8		
Mar-11	2242.9		904.4	2,237.5		
Apr-11	1652.6		511.2	1,652.4		
May-11	2327.8		296.4	2,328.9		
Jun-11	1892.2		161.0	1,892.2		
Jul-11	2223.5		127.8	2,222.8		
Aug-11	2359.8		218.3	2,357.2		
Sep-11	2109.7		328.6	2,109.2		
Nov-11	1808.9		513.4	1,810.2		
Nov-11	1790.4		936.1	1,784.2		
Dec-11	2108.9	25,171.0	774.4	2,118.4	25,165.8	
Jan-12	2309.7		1118.1	2,307.0		
Feb-12	1956.7		691.7	1,962.8		
Mar-12	2017.8		756.2	2,019.6		
Apr-12	1459.4		450.6	1,462.1		
May-12	1573.5		350.8	1,571.9		
Jun-12	2350.0		195.1	2,348.4		
Jul-12	2063.4		140.1	2,062.2		
Aug-12	2314.5		157.9	2,314.9		
Sep-12	1725.3		271.0	1,727.5		
Oct-12	1566.3		639.3	1,561.5		
Nov-12	1933.0		969.6	1,925.2		
Dec-12	2043.9	23,313.4	1196.8	2,033.0	23,296.1	

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Beaver Creek

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	2,415.2		952.0	2,420.5		
Feb-13	2,187.7		665.4	2,195.1		
Mar-13	1,908.5		851.1	1,905.6		
Apr-13	1,493.9		639.9	1,487.4		
May-13	1,913.3		294.0	1,914.5		
Jun-13	1,802.1		112.4	1,804.5		
Jul-13	2,976.0		92.5	2,977.1		
Aug-13	2,522.1		98.9	2,525.3		
Sep-13	2,157.4		264.3	2,160.0		
Oct-13	1,901.6		501.4	1,903.5		
Nov-13	1,704.2		865.6	1,701.4		
Dec-13	1,733.1	24,715.0	1,144.7	1,724.8	24,719.7	
Jan-14	2,960.5		745.8	2,975.7		
Feb-14	2,208.3		992.4	2,199.9		
Mar-14	1,882.3		855.1	1,879.3		
Apr-14	1,807.2		499.8	1,807.6		
May-14	1,554.4		269.5	1,556.8		
Jun-14	1,836.9		200.5	1,835.0		
Jul-14	1,738.1		98.0	1,738.9		
Aug-14	1,717.1		144.0	1,718.2		
Sep-14	2,433.1		307.1	2,433.6		
Oct-14	2,188.7		515.6	2,189.9		
Nov-14	2,203.9		772.8	2,205.6		
Dec-14	2,084.7	24,615.1	854.4	2,090.4	24,630.8	
Jan-15	2,624.4		927.0	2,630.9		
Feb-15	1,744.7		851.4	1,743.1		
Mar-15	2,396.2		671.3	2,402.0		
Apr-15	1,797.2		453.5	1,799.7		
May-15	1,783.6		192.9	1,789.7		
Jun-15	1,564.2		127.2	1,565.8		
Jul-15	1,991.0		115.7	1,990.9		
Aug-15	1,764.2		183.2	1,763.4		
Sep-15	2,158.4		332.7	2,157.6		
Oct-15	1,672.8		469.8	1,676.2		
Nov-15	2,012.7		759.2	2,015.1		
Dec-15	1,985.5	23,494.7	947.9	1,986.6	23,521.1	
Jan-16	2,713.2		827.6	2,724.5		
Feb-16	1,684.4		688.0	1,690.8		
Mar-16	2,077.3		611.6	2,086.1		
Apr-16	1,752.2					
May-16	1,739.0					
Jun-16	1,525.1					
Jul-16	1,941.2					
Aug-16	1,720.1					
Sep-16	2,104.4					
Oct-16	1,631.0					
Nov-16	1,962.4					
Dec-16	1,935.8	22,786.2			22,812.6	
Jan-17	2,645.4					
Feb-17	1,642.3					
Mar-17	2,025.4					
Apr-17	1,708.4					
May-17	1,695.5					
Jun-17	1,487.0					
Jul-17	1,892.7					
Aug-17	1,677.1					
Sep-17	2,051.8					
Oct-17	1,590.2					
Nov-17	1,913.4					
Dec-17	1,887.4	22,216.6			22,216.6	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (23,494.7 / 24,715.0) ^ {1/2} - 1 = \textbf{-2.5\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Tagish

Commercial	Annual		(Whitehorse)	Annual	
	Actual / Forecast	Normalized		Normalized	Normalized
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)
Jan-95	1197.3		1020.1	1,220.6	
Feb-95	1530.3		840.1	1,518.3	
Mar-95	1286.9		880.0	1,237.6	
Apr-95	998.9		439.9	1,036.7	
May-95	671.1		250.7	709.7	
Jun-95	754.3		139.0	766.6	
Jul-95	732.0		96.6	742.1	
Aug-95	771.4		198.3	753.1	
Sep-95	375.5		226.5	426.9	
Oct-95	782.1		524.9	790.7	
Nov-95	1126.4		894.4	1,077.8	
Dec-95	595.1	10,821.3	1048.6	552.1	10,832.2
Jan-96	1382.3		1556.4	1,102.8	
Feb-96	890.3		835.8	880.7	
Mar-96	880.6		805.8	873.1	
Apr-96	759.4		526.0	748.7	
May-96	727.4		357.3	705.8	
Jun-96	738.8		193.6	720.2	
Jul-96	774.0		124.9	768.1	
Aug-96	735.0		227.3	700.3	
Sep-96	731.1		362.6	705.7	
Oct-96	719.8		679.9	640.9	
Nov-96	729.2		975.0	635.1	
Dec-96	1156.6	10,224.4	1155.8	1,053.1	9,534.4
Jan-97	1508.9		1185.7	1,438.7	
Feb-97	1170.9		656.5	1,262.5	
Mar-97	1188.2		855.4	1,152.7	
Apr-97	1104.7		484.0	1,117.7	
May-97	981.2		331.1	974.4	
Jun-97	796.6		148.9	803.3	
Jul-97	825.5		92.8	837.8	
Aug-97	910.3		130.0	930.6	
Sep-97	808.3		282.1	828.4	
Oct-97	704.5		641.0	647.6	
Nov-97	656.2		694.0	720.7	
Dec-97	809.5	11,465.0	762.0	928.3	11,642.7
Jan-98	939.1		1165.7	880.2	
Feb-98	1213.3		719.1	1,269.6	
Mar-98	1000.7		756.6	1,021.1	
Apr-98	808.8		458.6	836.1	
May-98	787.6		270.6	815.0	
Jun-98	753.4		119.5	776.7	
Jul-98	810.1		111.6	811.7	
Aug-98	550.9		189.2	537.8	
Sep-98	1009.1		327.8	1,003.4	
Oct-98	791.6		557.7	781.8	
Nov-98	775.6		792.3	784.5	
Dec-98	916.2	10,356.5	1051.8	871.4	10,389.1
Jan-99	1133.0		1183.1	1,064.2	
Feb-99	810.3		976.4	721.3	
Mar-99	1283.8		734.0	1,316.9	
Apr-99	926.3		508.8	925.3	
May-99	684.4		391.9	643.3	
Jun-99	831.1		153.9	834.9	
Jul-99	953.9		108.6	957.2	
Aug-99	764.9		145.7	776.3	
Sep-99	575.8		311.2	579.4	
Oct-99	931.1		499.8	953.9	
Nov-99	1017.5		792.5	1,026.4	
Dec-99	1046.6	10,958.6	844.0	1,119.1	10,918.2
Jan-00	1387.2		1082.9	1,375.0	
Feb-00	1085.8		735.2	1,133.0	
Mar-00	1455.8		659.2	1,531.1	
Apr-00	706.3		515.6	701.4	
May-00	677.1		382.0	641.6	
Jun-00	809.0		172.5	802.3	
Jul-00	819.9		142.1	804.3	
Aug-00	855.8		219.9	825.3	
Sep-00	763.1		354.2	742.5	
Oct-00	569.3		539.2	569.9	
Nov-00	601.3		691.2	667.4	
Dec-00	1447.1	11,177.7	977.8	1,444.1	11,237.8

Regression Output:								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.593852846							
R Square	0.352661202							
Adjusted R Square	0.349024468							
Standard Error	253.5239896							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	6232814.052	6232814.052	96.97193224	1.54467E-18			
Residual	178	11440845.57	64274.41331					
Total	179	17673659.62						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	605.9620125	36.46963617	16.61552119	4.84849E-38	533.9935295	677.9304955	533.9935295	677.9304955
WH-HDD	0.56457489	0.05733219	9.847432774	1.54467E-18	0.451436642	0.677713139	0.451436642	0.677713139

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	1299.1		722.7	1,490.3		
Feb-01	1351.9		864.1	1,326.3		
Mar-01	1208.4		765.3	1,223.8		
Apr-01	989.5		506.8	989.6		
May-01	518.9		390.4	478.6		
Jun-01	960.1		167.3	956.3		
Jul-01	875.9		139.6	861.7		
Aug-01	919.5		139.6	934.3		
Sep-01	733.1		309.0	738.0		
Oct-01	712.7		573.4	694.0		
Nov-01	1000.1		818.0	994.6		
Dec-01	1202.6	11,771.8	1094.6	1,133.6	11,821.2	
Jan-02	1144.4		935.6	1,215.4		
Feb-02	1722.8		824.6	1,719.6		
Mar-02	1343.8		921.1	1,271.2		
Apr-02	1333.8		653.3	1,251.2		
May-02	710.9		361.6	686.9		
Jun-02	698.4		175.6	689.9		
Jul-02	677.0		130.9	667.7		
Aug-02	694.4		182.8	684.8		
Sep-02	343.8		314.4	345.6		
Oct-02	870.4		444.3	924.5		
Nov-02	858.9		582.6	986.3		
Dec-02	1043.5	11,442.0	845.2	1,115.3	11,558.4	
Jan-03	1402.1		989.1	1,442.9		
Feb-03	1082.3		756.6	1,117.4		
Mar-03	1071.8		834.5	1,048.1		
Apr-03	1089.7		514.3	1,085.5		
May-03	513.2		363.7	488.0		
Jun-03	662.6		192.8	644.5		
Jul-03	514.9		84.4	531.9		
Aug-03	903.1		180.6	894.8		
Sep-03	369.2		359.2	345.7		
Oct-03	943.0		466.7	984.5		
Nov-03	902.8		874.6	865.3		
Dec-03	1229.0	10,683.5	911.6	1,263.3	10,711.8	
Jan-04	829.9		1257.9	718.9		
Feb-04	1020.1		697.2	1,088.8		
Mar-04	1334.8		753.5	1,356.9		
Apr-04	1117.2		466.6	1,140.0		
May-04	315.8		272.5	342.1		
Jun-04	799.9		83.7	843.3		
Jul-04	588.9		74.2	611.6		
Aug-04	593.7		101.7	629.9		
Sep-04	651.8		367.5	623.6		
Oct-04	563.1		540.5	562.9		
Nov-04	344.6		719.8	394.5		
Dec-04	647.4	8,807.0	899.5	688.6	9,001.1	
Jan-05	1466.2		1165.8	1,407.2		
Feb-05	808.8		795.2	822.1		
Mar-05	1131.0		613.7	1,231.9		
Apr-05	994.1		453.3	1,024.4		
May-05	425.8		256.6	461.0		
Jun-05	614.1		154.4	617.6		
Jul-05	645.2		132.6	634.9		
Aug-05	622.4		150.8	630.9		
Sep-05	705.7		299.3	716.0		
Oct-05	683.9		534.6	687.0		
Nov-05	982.2		762.6	1,008.0		
Dec-05	1055.1	10,134.2	794.4	1,155.6	10,396.7	
Jan-06	1354.3		1096.2	1,334.6		
Feb-06	1093.7		821.3	1,092.3		
Mar-06	946.4		906.3	882.2		
Apr-06	676.1		519.1	669.2		
May-06	1487.4		346.9	1,471.6		
Jun-06	588.4		173.1	581.3		
Jul-06	643.9		118.4	641.7		
Aug-06	504.8		201.6	484.6		
Sep-06	577.7		295.7	590.0		
Oct-06	530.7		520.5	541.8		
Nov-06	758.5		1162.2	558.7		
Dec-06	1107.5	10,269.2	824.3	1,191.1	10,039.2	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	1492.7		912.0	1,577.0		
Feb-07	993.5		998.8	891.9		
Mar-07	1120.9		954.2	1,029.6		
Apr-07	1244.5		511.9	1,241.8		
May-07	890.3		322.1	888.6		
Jun-07	340.5		140.5	351.9		
Jul-07	635.7		102.3	642.6		
Aug-07	643.2		154.2	649.8		
Sep-07	680.2		308.4	685.4		
Oct-07	593.9		543.7	591.9		
Nov-07	1062.5		724.6	1,109.7		
Dec-07	1343.9	11,041.9	1069.5	1,289.1	10,949.4	
Jan-08	1147.9		1113.8	1,118.3		
Feb-08	1658.0		954.6	1,581.4		
Mar-08	1115.6		734.7	1,148.3		
Apr-08	1056.9		517.3	1,051.1		
May-08	919.6		307.9	925.9		
Jun-08	592.5		225.6	555.8		
Jul-08	621.0		173.4	587.8		
Aug-08	731.2		187.7	718.9		
Sep-08	578.0		318.7	577.4		
Oct-08	831.2		563.0	818.3		
Nov-08	1033.5		782.5	1,048.1		
Dec-08	1077.5	11,363.0	1186.2	956.8	11,088.0	
Jan-09	1115.8		1137.9	1,072.6		
Feb-09	1269.3		955.4	1,192.2		
Mar-09	1003.3		868.5	960.5		
Apr-09	1050.3		515.2	1,045.7		
May-09	809.8		331.2	802.9		
Jun-09	695.3		144.1	704.6		
Jul-09	775.0		62.5	804.3		
Aug-09	732.2		158.3	736.5		
Sep-09	721.0		306.1	727.5		
Oct-09	723.6		541.8	722.7		
Nov-09	891.0		781.5	906.1		
Dec-09	1049.8	10,836.5	955.2	1,059.6	10,735.2	
Jan-10	1312.3		991.1	1,351.9		
Feb-10	877.0		679.2	955.8		
Mar-10	1191.8		656.0	1,268.9		
Apr-10	1087.8		461.2	1,113.7		
May-10	929.9		292.0	945.2		
Jun-10	757.3		171.9	750.9		
Jul-10	682.5		117.3	681.0		
Aug-10	635.0		146.2	646.1		
Sep-10	620.5		332.4	612.2		
Oct-10	830.2		520.4	841.4		
Nov-10	902.9		717.6	954.0		
Dec-10	1041.3	10,868.5	1162.5	934.0	11,055.1	
Jan-11	1305.7		1010.2	1,334.5		
Feb-11	1067.3		905.6	1,018.3		
Mar-11	1058.1		904.4	995.0		
Apr-11	1242.0		511.2	1,239.6		
May-11	1286.5		296.4	1,299.3		
Jun-11	693.2		161.0	693.1		
Jul-11	591.1		127.8	583.6		
Aug-11	587.5		218.3	557.9		
Sep-11	555.6		328.6	549.4		
Nov-11	637.8		513.4	652.9		
Nov-11	697.7		936.1	625.5		
Dec-11	1090.3	10,812.5	774.4	1,202.1	10,751.0	
Jan-12	1400.4		1118.1	1,368.3		
Feb-12	721.9		691.7	793.7		
Mar-12	1107.2		756.2	1,127.8		
Apr-12	873.6		450.6	905.4		
May-12	694.3		350.8	676.4		
Jun-12	661.0		195.1	641.6		
Jul-12	787.1		140.1	772.7		
Aug-12	668.5		157.9	673.0		
Sep-12	578.4		271.0	604.7		
Oct-12	658.9		639.3	602.9		
Nov-12	948.0		969.6	856.9		
Dec-12	936.5	10,036.0	1196.8	809.8	9,833.3	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	1,248.3		952.0	1,310.0		
Feb-13	1,046.9		665.4	1,133.5		
Mar-13	1,001.3		851.1	968.2		
Apr-13	929.8		639.9	854.7		
May-13	617.5		294.0	631.7		
Jun-13	755.7		112.4	783.0		
Jul-13	715.6		92.5	728.0		
Aug-13	768.1		98.9	805.9		
Sep-13	608.2		264.3	638.3		
Oct-13	653.0		501.4	674.9		
Nov-13	904.0		865.6	871.7		
Dec-13	964.3	10,212.6	1,144.7	867.1	10,266.9	
Jan-14	1,768.1		745.8	1,946.3		
Feb-14	1,171.3		992.4	1,073.3		
Mar-14	1,148.8		855.1	1,113.5		
Apr-14	1,085.0		499.8	1,089.1		
May-14	1,710.8		269.5	1,738.8		
Jun-14	874.4		200.5	851.9		
Jul-14	807.7		98.0	817.0		
Aug-14	786.4		144.0	798.7		
Sep-14	776.8		307.1	782.8		
Oct-14	713.3		515.6	727.2		
Nov-14	951.7		772.8	971.7		
Dec-14	1,028.6	12,822.9	854.4	1,095.2	13,005.4	
Jan-15	2,339.1		927.0	2,414.9		
Feb-15	1,559.1		851.4	1,540.7		
Mar-15	544.7		671.3	613.1		
Apr-15	1,214.5		453.5	1,244.7		
May-15	931.4		192.9	1,002.6		
Jun-15	649.2		127.2	668.1		
Jul-15	673.8		115.7	673.1		
Aug-15	562.6		183.2	552.9		
Sep-15	798.1		332.7	789.6		
Oct-15	1,243.5		469.8	1,283.2		
Nov-15	1,360.4		759.2	1,388.1		
Dec-15	1,384.5	13,260.9	947.9	1,398.4	13,569.5	
Jan-16	1,636.8		827.6	1,768.8		
Feb-16	1,615.8		688.0	1,689.7		
Mar-16	1,348.8		611.6	1,451.0		
Apr-16	1,383.9					
May-16	1,061.3					
Jun-16	739.8					
Jul-16	767.8					
Aug-16	641.1					
Sep-16	909.5					
Oct-16	1,417.0					
Nov-16	1,550.2					
Dec-16	1,577.7	14,649.7			14,957.7	
Jan-17	1,865.2					
Feb-17	1,841.3					
Mar-17	1,536.9					
Apr-17	1,577.0					
May-17	1,209.4					
Jun-17	843.0					
Jul-17	874.9					
Aug-17	730.6					
Sep-17	1,038.4					
Oct-17	1,614.7					
Nov-17	1,766.4					
Dec-17	1,797.8	16,693.5			16,693.5	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (13,260.9 / 10,212.6) ^ {1/2} - 1 = \mathbf{14.0\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Annual		Annual			
Commercial	Actual / Forecast	(Whitehorse)	Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	UPC (kWh)	UPC (kWh)	
Jan-95	1159.4		1020.1	1,181.6	
Feb-95	1156.4		840.1	1,144.9	
Mar-95	1590.6		880.0	1,543.4	
Apr-95	1883.9		439.9	1,920.1	
May-95	1008.8		250.7	1,045.7	
Jun-95	1065.9		139.0	1,077.6	
Jul-95	1261.8		96.6	1,271.5	
Aug-95	1362.8		198.3	1,345.2	
Sep-95	1069.3		226.5	1,118.5	
Oct-95	1186.6		524.9	1,194.8	
Nov-95	1301.2		894.4	1,254.6	
Dec-95	1461.5	15,508.0	1048.6	1,420.3	15,518.4
Jan-96	1429.3		1556.4	1,161.7	
Feb-96	2202.5		835.8	2,193.3	
Mar-96	1933.5		805.8	1,926.3	
Apr-96	1983.6		526.0	1,973.3	
May-96	1499.5		357.3	1,478.9	
Jun-96	1555.5		193.6	1,537.8	
Jul-96	1347.5		124.9	1,341.9	
Aug-96	2233.7		227.3	2,200.5	
Sep-96	1550.4		362.6	1,526.0	
Oct-96	1757.4		679.9	1,681.9	
Nov-96	2392.2		975.0	2,302.0	
Dec-96	2715.8	22,601.0	1155.8	2,616.7	21,940.5
Jan-97	2651.4		1185.7	2,584.2	
Feb-97	2161.8		656.5	2,249.5	
Mar-97	2137.0		855.4	2,103.1	
Apr-97	2455.5		484.0	2,467.9	
May-97	1488.0		331.1	1,481.5	
Jun-97	1385.5		148.9	1,391.9	
Jul-97	1613.2		92.8	1,624.9	
Aug-97	1407.7		130.0	1,427.1	
Sep-97	1224.9		282.1	1,244.1	
Oct-97	1294.4		641.0	1,239.9	
Nov-97	1703.3		694.0	1,765.0	
Dec-97	1928.6	21,451.3	762.0	2,042.4	21,621.4
Jan-98	1457.6		1165.7	1,401.2	
Feb-98	1348.1		719.1	1,402.0	
Mar-98	1082.9		756.6	1,102.4	
Apr-98	417.0		458.6	443.2	
May-98	371.1		270.6	397.3	
Jun-98	350.4		119.5	372.7	
Jul-98	438.8		111.6	440.4	
Aug-98	387.8		189.2	375.2	
Sep-98	441.4		327.8	435.9	
Oct-98	520.5		557.7	511.0	
Nov-98	505.9		792.3	514.5	
Dec-98	1558.7	8,880.2	1051.8	1,515.8	8,911.4
Jan-99	1518.2		1183.1	1,452.4	
Feb-99	929.3		976.4	844.2	
Mar-99	698.4		734.0	730.1	
Apr-99	776.0		508.8	775.0	
May-99	416.6		391.9	377.2	
Jun-99	400.0		153.9	403.7	
Jul-99	367.5		108.6	370.7	
Aug-99	397.8		145.7	408.7	
Sep-99	519.2		311.2	522.7	
Oct-99	838.1		499.8	860.0	
Nov-99	1185.2		792.5	1,193.7	
Dec-99	1773.9	9,820.4	844.0	1,843.3	9,781.7
Jan-00	1162.3		1082.9	1,150.7	
Feb-00	1436.3		735.2	1,481.5	
Mar-00	1463.7		659.2	1,535.8	
Apr-00	1160.5		515.6	1,155.9	
May-00	790.5		382.0	756.5	
Jun-00	762.5		172.5	756.1	
Jul-00	915.1		142.1	900.1	
Aug-00	912.5		219.9	883.3	
Sep-00	822.9		354.2	803.1	
Oct-00	713.5		539.2	714.0	
Nov-00	697.6		691.2	760.9	
Dec-00	930.4	11,767.8	977.8	927.5	11,825.4

Regression Output:									
SUMMARY OUTPUT									
Regression Statistics									
Multiple R	0.58775761								
R Square	0.345459008								
Adjusted R Square	0.341781812								
Standard Error	246.5817218								
Observations	180								
ANOVA									
	df	SS	MS	F	Significance F				
Regression	1	5712174.095	5712174.095	93.94629858	4.1768E-18				
Residual	178	10822853.1	60802.54551						
Total	179	16535027.2							
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	
Intercept	670.6534727	35.47098518	18.90710025	1.95892E-44	600.6557085	740.651237	600.6557085	740.651237	
WH-HDD	0.540480701	0.055762258	9.69258988	4.1768E-18	0.430440526	0.650520876	0.430440526	0.650520876	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-01	1120.5		722.7	1,303.5		
Feb-01	997.3		864.1	972.8		
Mar-01	972.7		765.3	987.4		
Apr-01	722.2		506.8	722.3		
May-01	629.0		390.4	590.4		
Jun-01	557.2		167.3	553.6		
Jul-01	609.9		139.6	596.3		
Aug-01	535.2		139.6	549.4		
Sep-01	529.4		309.0	534.1		
Oct-01	486.2		573.4	468.3		
Nov-01	625.0		818.0	619.7		
Dec-01	923.7	8,708.2	1094.6	857.7	8,755.5	
Jan-02	1097.6		935.6	1,165.5		
Feb-02	839.7		824.6	836.6		
Mar-02	887.4		921.1	817.9		
Apr-02	928.4		653.3	849.3		
May-02	494.6		361.6	471.6		
Jun-02	446.9		175.6	438.8		
Jul-02	506.3		130.9	497.4		
Aug-02	598.0		182.8	588.9		
Sep-02	539.0		314.4	540.7		
Oct-02	495.8		444.3	547.7		
Nov-02	574.6		582.6	696.5		
Dec-02	1052.4	8,460.7	845.2	1,121.2	8,572.2	
Jan-03	1186.2		989.1	1,225.2		
Feb-03	873.5		756.6	907.1		
Mar-03	1076.5		834.5	1,053.8		
Apr-03	851.0		514.3	847.0		
May-03	555.5		363.7	531.4		
Jun-03	626.3		192.8	608.9		
Jul-03	680.7		84.4	696.9		
Aug-03	708.4		180.6	700.4		
Sep-03	758.2		359.2	735.7		
Oct-03	580.0		466.7	619.7		
Nov-03	915.0		874.6	879.2		
Dec-03	1224.8	10,035.8	911.6	1,257.6	10,063.0	
Jan-04	975.2		1257.9	869.0		
Feb-04	990.9		697.2	1,056.6		
Mar-04	1011.2		753.5	1,032.3		
Apr-04	992.0		466.6	1,013.9		
May-04	628.4		272.5	653.5		
Jun-04	891.4		83.7	933.0		
Jul-04	701.4		74.2	723.1		
Aug-04	676.9		101.7	711.6		
Sep-04	677.2		367.5	650.2		
Oct-04	584.5		540.5	584.3		
Nov-04	714.1		719.8	761.9		
Dec-04	850.5	9,693.6	899.5	889.9	9,879.4	
Jan-05	823.9		1165.8	767.4		
Feb-05	811.2		795.2	824.0		
Mar-05	856.7		613.7	953.4		
Apr-05	632.8		453.3	661.8		
May-05	631.9		256.6	665.6		
Jun-05	667.6		154.4	671.0		
Jul-05	630.6		132.6	620.8		
Aug-05	599.3		150.8	607.4		
Sep-05	659.3		299.3	669.2		
Oct-05	554.2		534.6	557.2		
Nov-05	843.7		762.6	868.3		
Dec-05	1035.1	8,746.3	794.4	1,131.3	8,997.6	
Jan-06	1042.5		1096.2	1,023.7		
Feb-06	1098.0		821.3	1,096.6		
Mar-06	1028.6		906.3	967.1		
Apr-06	789.3		519.1	782.8		
May-06	605.8		346.9	590.7		
Jun-06	767.0		173.1	760.3		
Jul-06	634.7		118.4	632.6		
Aug-06	852.4		201.6	833.0		
Sep-06	786.7		295.7	798.5		
Oct-06	531.2		520.5	541.9		
Nov-06	880.9		1162.2	689.6		
Dec-06	869.8	9,886.9	824.3	949.8	9,666.7	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	1028.8		912.0	1,109.5		
Feb-07	1496.2		998.8	1,398.9		
Mar-07	890.3		954.2	803.0		
Apr-07	795.0		511.9	792.4		
May-07	752.1		322.1	750.5		
Jun-07	677.8		140.5	688.7		
Jul-07	697.3		102.3	703.9		
Aug-07	802.5		154.2	808.8		
Sep-07	787.5		308.4	792.5		
Oct-07	757.4		543.7	755.5		
Nov-07	1174.4		724.6	1,219.6		
Dec-07	1166.1	11,025.5	1069.5	1,113.6	10,936.9	
Jan-08	1243.9		1113.8	1,215.6		
Feb-08	1263.5		954.6	1,190.1		
Mar-08	1151.4		734.7	1,182.6		
Apr-08	1098.4		517.3	1,092.8		
May-08	784.3		307.9	790.3		
Jun-08	826.5		225.6	791.4		
Jul-08	756.9		173.4	725.1		
Aug-08	910.5		187.7	898.7		
Sep-08	718.8		318.7	718.2		
Oct-08	802.6		563.0	790.3		
Nov-08	1184.1		782.5	1,198.0		
Dec-08	1430.2	12,171.1	1186.2	1,314.7	11,907.8	
Jan-09	1393.4		1137.9	1,352.0		
Feb-09	1155.5		955.4	1,081.7		
Mar-09	1623.4		868.5	1,582.4		
Apr-09	486.5		515.2	482.0		
May-09	736.0		331.2	729.4		
Jun-09	699.5		144.1	708.5		
Jul-09	804.3		62.5	832.4		
Aug-09	756.9		158.3	761.0		
Sep-09	856.0		306.1	862.3		
Oct-09	810.6		541.8	809.8		
Nov-09	924.5		781.5	939.0		
Dec-09	1214.7	11,461.4	955.2	1,224.0	11,364.4	
Jan-10	1131.6		991.1	1,169.6		
Feb-10	912.4		679.2	987.9		
Mar-10	988.6		656.0	1,062.4		
Apr-10	915.3		461.2	940.0		
May-10	846.0		292.0	860.6		
Jun-10	658.5		171.9	652.5		
Jul-10	931.0		117.3	929.4		
Aug-10	906.2		146.2	916.9		
Sep-10	602.1		332.4	594.1		
Oct-10	1664.8		520.4	1,675.5		
Nov-10	1300.0		717.6	1,348.9		
Dec-10	1431.0	12,287.4	1162.5	1,328.2	12,466.1	
Jan-11	1737.2		1010.2	1,764.9		
Feb-11	1254.8		905.6	1,207.9		
Mar-11	1632.9		904.4	1,572.5		
Apr-11	1620.2		511.2	1,617.9		
May-11	1025.6		296.4	1,037.8		
Jun-11	981.0		161.0	980.9		
Jul-11	812.3		127.8	805.1		
Aug-11	846.2		218.3	817.9		
Sep-11	945.6		328.6	939.6		
Nov-11	920.6		513.4	935.1		
Nov-11	1203.8		936.1	1,134.7		
Dec-11	1581.5	14,561.8	774.4	1,688.6	14,502.9	
Jan-12	1502.7		1118.1	1,472.0		
Feb-12	1578.4		691.7	1,647.1		
Mar-12	1325.1		756.2	1,344.8		
Apr-12	1194.9		450.6	1,225.4		
May-12	1301.3		350.8	1,284.2		
Jun-12	919.6		195.1	901.0		
Jul-12	853.8		140.1	840.0		
Aug-12	976.5		157.9	980.8		
Sep-12	876.9		271.0	902.1		
Oct-12	1015.2		639.3	961.6		
Nov-12	1416.5		969.6	1,329.3		
Dec-12	1570.1	14,531.0	1196.8	1,448.8	14,337.0	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	1,284.8		952.0	1,343.9		
Feb-13	1,825.2		665.4	1,908.2		
Mar-13	1,310.8		851.1	1,279.2		
Apr-13	1,356.7		639.9	1,284.9		
May-13	1,217.8		294.0	1,231.3		
Jun-13	1,017.0		112.4	1,043.1		
Jul-13	819.7		92.5	831.5		
Aug-13	885.5		98.9	921.7		
Sep-13	876.1		264.3	904.9		
Oct-13	1,106.4		501.4	1,127.3		
Nov-13	1,143.6		865.6	1,112.6		
Dec-13	1,417.3	14,260.9	1,144.7	1,324.1	14,312.9	
Jan-14	1,566.0		745.8	1,736.5		
Feb-14	1,375.1		992.4	1,281.3		
Mar-14	1,386.1		855.1	1,352.3		
Apr-14	1,505.5		499.8	1,509.4		
May-14	1,125.0		269.5	1,151.7		
Jun-14	909.5		200.5	888.0		
Jul-14	968.7		98.0	977.6		
Aug-14	896.3		144.0	908.1		
Sep-14	1,079.0		307.1	1,084.6		
Oct-14	1,080.1		515.6	1,093.4		
Nov-14	1,342.8		772.8	1,361.9		
Dec-14	1,706.0	14,939.9	854.4	1,769.7	15,114.7	
Jan-15	1,322.9		927.0	1,395.5		
Feb-15	1,197.6		851.4	1,180.0		
Mar-15	1,134.0		671.3	1,199.5		
Apr-15	1,243.1		453.5	1,272.0		
May-15	967.7		192.9	1,035.8		
Jun-15	812.6		127.2	830.7		
Jul-15	827.5		115.7	826.8		
Aug-15	767.1		183.2	757.8		
Sep-15	1,174.6		332.7	1,166.5		
Oct-15	963.7		469.8	1,001.7		
Nov-15	1,091.8		759.2	1,118.3		
Dec-15	1,374.6	12,877.0	947.9	1,387.8	13,172.4	
Jan-16	1,331.0		827.6	1,457.3		
Feb-16	1,130.8		688.0	1,201.5		
Mar-16	1,258.1		611.6	1,355.9		
Apr-16	1,181.3					
May-16	919.5					
Jun-16	772.2					
Jul-16	786.3					
Aug-16	729.0					
Sep-16	1,116.2					
Oct-16	915.7					
Nov-16	1,037.4					
Dec-16	1,306.2	12,483.6			12,778.5	
Jan-17	1,264.8					
Feb-17	1,074.6					
Mar-17	1,195.5					
Apr-17	1,122.5					
May-17	873.7					
Jun-17	733.8					
Jul-17	747.2					
Aug-17	692.7					
Sep-17	1,060.6					
Oct-17	870.2					
Nov-17	985.8					
Dec-17	1,241.2	11,862.5			11,862.5	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (12,877.0 / 14,260.9) ^ {1/2} - 1 = \text{-5.0\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Commercial	Annual			Annual		Regression Output:																																																			
	Actual / Forecast	(Watson Lake)	Normalized	Normalized																																																					
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)																																																				
Jan-95	1559.7		938.7	1,876.8		SUMMARY OUTPUT Regression Statistics Multiple R0.738449566 R Square0.545307761 Adjusted R Square0.54275331 Standard Error381.9434628 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>31141698.94</td><td>31141698.94</td><td>213.473583</td><td>2.77122E-32</td></tr><tr><td>Residual</td><td>178</td><td>25966783.96</td><td>145880.8088</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>57108482.9</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>879.8935732</td><td>51.35633696</td><td>17.13310616</td><td>1.66553E-39</td><td>778.5479593</td><td>981.239187</td><td>778.5479593</td><td>981.239187</td></tr><tr><td>WL-HDD</td><td>1.021852512</td><td>0.069938473</td><td>14.6107352</td><td>2.77122E-32</td><td>0.883837265</td><td>1.159867758</td><td>0.883837265</td><td>1.159867758</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	31141698.94	31141698.94	213.473583	2.77122E-32	Residual	178	25966783.96	145880.8088			Total	179	57108482.9					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	879.8935732	51.35633696	17.13310616	1.66553E-39	778.5479593	981.239187	778.5479593	981.239187	WL-HDD	1.021852512	0.069938473	14.6107352	2.77122E-32	0.883837265	1.159867758	0.883837265	1.159867758
	df	SS	MS	F	Significance F																																																				
Regression	1	31141698.94	31141698.94	213.473583	2.77122E-32																																																				
Residual	178	25966783.96	145880.8088																																																						
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	Coefficients	Standard Error	t Stat	P-value	Lower 95%		Upper 95%	Lower 95.0%	Upper 95.0%																																																
Intercept	879.8935732	51.35633696	17.13310616	1.66553E-39	778.5479593		981.239187	778.5479593	981.239187																																																
WL-HDD	1.021852512	0.069938473	14.6107352	2.77122E-32	0.883837265		1.159867758	0.883837265	1.159867758																																																
Feb-95	1245.5		941.9	1,284.7																																																					
Mar-95	1441.8		855.6	1,478.8																																																					
Apr-95	1011.6		492.7	1,070.0																																																					
May-95	600.1		242.5	676.7																																																					
Jun-95	656.5		97.0	699.9																																																					
Jul-95	633.0		113.0	611.2																																																					
Aug-95	946.4		189.9	905.4																																																					
Sep-95	807.4		224.9	890.9																																																					
Oct-95	1335.9		552.7	1,343.9																																																					
Nov-95	1880.9		1000.2	1,837.8																																																					
Dec-95	1813.5	13,932.3	1295.4	1,702.0	14,378.3																																																				
Jan-96	1821.0		1605.2	1,457.0																																																					
Feb-96	1669.2		947.3	1,702.9																																																					
Mar-96	1667.9		874.3	1,685.8																																																					
Apr-96	1703.0		547.7	1,705.2																																																					
May-96	1157.1		366.4	1,107.1																																																					
Jun-96	996.1		163.9	971.1																																																					
Jul-96	868.6		103.3	856.7																																																					
Aug-96	917.4		185.1	881.4																																																					
Sep-96	1071.0		354.7	1,021.9																																																					
Oct-96	494.0		662.2	390.2																																																					
Nov-96	1430.0		1121.2	1,263.3																																																					
Dec-96	1589.1	15,384.4	1361.1	1,410.5	14,453.1																																																				
Jan-97	1952.0		1406.6	1,791.0																																																					
Feb-97	1388.1		884.8	1,485.7																																																					
Mar-97	1934.0		943.9	1,880.8																																																					
Apr-97	1365.7		527.9	1,388.1																																																					
May-97	798.0		311.8	803.8																																																					
Jun-97	671.3		142.6	668.1																																																					
Jul-97	793.8		84.1	801.6																																																					
Aug-97	705.5		109.6	746.5																																																					
Sep-97	395.8		271.1	432.1																																																					
Oct-97	804.1		659.7	702.8																																																					
Nov-97	1609.3		935.8	1,632.0																																																					
Dec-97	1665.9	14,083.5	983.7	1,873.0	14,205.5																																																				
Jan-98	2570.5		1409.7	2,406.3																																																					
Feb-98	2148.8		942.0	2,187.9																																																					
Mar-98	1845.1		843.4	1,894.6																																																					
Apr-98	1167.4		500.1	1,218.2																																																					
May-98	973.3		211.0	1,082.1																																																					
Jun-98	839.7		89.0	891.3																																																					
Jul-98	591.9		65.7	618.5																																																					
Aug-98	1084.3		156.8	1,077.1																																																					
Sep-98	526.9		320.7	512.5																																																					
Oct-98	1145.0		561.2	1,144.4																																																					
Nov-98	1661.1		958.1	1,661.1																																																					
Dec-98	2347.3	16,901.2	1252.7	2,279.5	16,973.3																																																				
Jan-99	2379.6		1350.2	2,276.2																																																					
Feb-99	2361.6		1066.4	2,273.7																																																					
Mar-99	2059.0		871.4	2,079.9																																																					
Apr-99	1365.0		506.4	1,409.4																																																					
May-99	1093.0		372.2	1,037.0																																																					
Jun-99	1145.9		140.2	1,145.2																																																					
Jul-99	723.9		99.4	716.1																																																					
Aug-99	616.0		127.8	638.5																																																					
Sep-99	906.8		292.5	921.2																																																					
Oct-99	1172.5		519.8	1,214.2																																																					
Nov-99	1746.7		939.9	1,765.3																																																					
Dec-99	2075.3	17,645.4	1013.0	2,252.4	17,729.0																																																				
Jan-00	2350.7		1344.8	2,252.8																																																					
Feb-00	2343.0		956.0	2,367.8																																																					
Mar-00	1744.2		750.1	1,889.1																																																					
Apr-00	1525.8		590.9	1,483.8																																																					
May-00	1189.2		373.8	1,131.6																																																					
Jun-00	959.4		158.0	940.5																																																					
Jul-00	706.7		84.3	714.2																																																					
Aug-00	820.8		216.9	752.2																																																					
Sep-00	959.2		314.8	950.9																																																					
Oct-00	1292.9		575.8	1,277.4																																																					
Nov-00	2086.1		858.4	2,188.0																																																					
Dec-00	2214.2	18,192.2	1222.8	2,177.0	18,125.1																																																				

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake)		UPC (kWh)	UPC (kWh)	
Jan-01	2757.3		1043.4	2,967.4		
Feb-01	2323.6		1031.0	2,271.7		
Mar-01	2216.2		844.9	2,264.2		
Apr-01	1851.0		535.8	1,865.3		
May-01	1246.2		366.6	1,196.0		
Jun-01	1051.9		155.5	1,035.5		
Jul-01	855.4		120.3	826.2		
Aug-01	1046.4		120.6	1,076.3		
Sep-01	823.3		299.6	830.5		
Oct-01	1058.3		577.0	1,041.6		
Nov-01	1888.4		975.0	1,871.1		
Dec-01	2408.6	19,526.8	1275.4	2,317.5	19,563.4	
Jan-02	2930.8		1246.3	2,933.5		
Feb-02	2462.2		970.3	2,472.4		
Mar-02	2454.3		991.6	2,352.4		
Apr-02	2128.4		694.8	1,980.3		
May-02	1544.0		365.9	1,494.5		
Jun-02	1113.4		147.8	1,104.9		
Jul-02	891.8		121.6	861.2		
Aug-02	734.8		181.5	702.4		
Sep-02	903.1		331.0	878.2		
Oct-02	988.4		514.8	1,035.2		
Nov-02	1500.2		821.9	1,639.4		
Dec-02	2026.8	19,678.3	1117.9	2,096.7	19,551.2	
Jan-03	2702.2		1177.5	2,775.3		
Feb-03	2573.4		964.7	2,589.4		
Mar-03	2407.0		899.5	2,399.2		
Apr-03	2254.6		554.4	2,249.9		
May-03	1326.4		341.6	1,301.8		
Jun-03	996.0		179.9	954.7		
Jul-03	1085.7		56.6	1,121.5		
Aug-03	902.0		163.0	888.5		
Sep-03	1027.3		330.2	1,003.2		
Oct-03	1127.9		526.1	1,163.1		
Nov-03	1656.9		963.9	1,650.9		
Dec-03	2759.2	20,818.7	1095.5	2,852.0	20,949.5	
Jan-04	2783.1		1365.6	2,664.0		
Feb-04	2545.1		881.2	2,646.4		
Mar-04	2109.7		809.9	2,193.4		
Apr-04	1818.2		497.4	1,871.8		
May-04	1145.0		292.3	1,170.7		
Jun-04	1088.7		74.1	1,155.5		
Jul-04	872.8		35.6	930.1		
Aug-04	832.0		145.7	836.2		
Sep-04	1099.6		370.7	1,034.1		
Oct-04	1016.4		565.0	1,011.9		
Nov-04	1461.4		875.5	1,545.8		
Dec-04	1515.8	18,287.8	1070.7	1,633.9	18,693.7	
Jan-05	2196.9		1330.3	2,113.8		
Feb-05	1650.1		941.8	1,689.5		
Mar-05	1809.4		726.9	1,978.0		
Apr-05	2012.8		464.8	2,099.6		
May-05	1382.6		256.9	1,444.4		
Jun-05	980.6		126.6	993.7		
Jul-05	1022.7		136.9	976.5		
Aug-05	993.6		162.2	980.9		
Sep-05	1156.6		297.3	1,166.1		
Oct-05	1176.3		541.7	1,195.6		
Nov-05	1776.8		758.4	1,980.8		
Dec-05	1738.4	17,896.6	1061.0	1,866.4	18,485.3	
Jan-06	2104.9		1185.2	2,170.1		
Feb-06	4405.6		1016.7	4,368.4		
Mar-06	2739.0		960.5	2,668.9		
Apr-06	1858.6		528.2	1,880.7		
May-06	1311.5		371.1	1,256.7		
Jun-06	1244.0		136.5	1,247.0		
Jul-06	1054.8		79.2	1,067.5		
Aug-06	1026.3		171.7	1,003.9		
Sep-06	1079.0		292.4	1,093.5		
Oct-06	1144.5		543.3	1,162.2		
Nov-06	1528.3		1196.2	1,284.9		
Dec-06	1401.0	20,897.4	1050.0	1,540.3	20,744.1	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-07	1806.8		1102.4	1,956.5		
Feb-07	1656.0		1017.3	1,618.2		
Mar-07	1602.0		1001.9	1,489.6		
Apr-07	1670.1		543.0	1,677.1		
May-07	1372.6		332.2	1,357.5		
Jun-07	1069.5		122.6	1,086.7		
Jul-07	1181.5		88.6	1,184.7		
Aug-07	974.5		143.1	981.3		
Sep-07	1050.8		314.7	1,042.5		
Oct-07	1242.8		553.1	1,250.5		
Nov-07	1372.9		956.6	1,374.4		
Dec-07	1494.6	16,494.1	1255.1	1,424.3	16,443.4	
Jan-08	1721.5		1300.1	1,669.3		
Feb-08	1702.5		1064.2	1,616.8		
Mar-08	1586.0		833.3	1,645.8		
Apr-08	1616.8		554.0	1,612.6		
May-08	1394.9		295.6	1,417.2		
Jun-08	893.9		191.0	841.2		
Jul-08	701.3		131.5	660.6		
Aug-08	665.1		154.0	660.8		
Sep-08	714.0		304.2	716.5		
Oct-08	964.7		523.5	1,002.6		
Nov-08	1264.2		882.5	1,341.5		
Dec-08	1541.8	14,766.7	1386.5	1,337.2	14,522.1	
Jan-09	1876.7		1329.3	1,794.6		
Feb-09	1614.4		1089.5	1,502.8		
Mar-09	1549.2		1054.2	1,383.3		
Apr-09	1385.5		590.0	1,344.4		
May-09	1062.9		356.0	1,023.5		
Jun-09	941.7		131.2	950.1		
Jul-09	970.8		89.0	973.5		
Aug-09	844.2		134.4	859.9		
Sep-09	1040.9		279.4	1,068.7		
Oct-09	1104.7		606.9	1,057.4		
Nov-09	1362.5		996.5	1,323.2		
Dec-09	1770.9	15,524.2	1340.7	1,613.1	14,894.6	
Jan-10	2141.7		1219.7	2,171.7		
Feb-10	1759.0		965.8	1,773.8		
Mar-10	1685.6		763.5	1,816.7		
Apr-10	1477.3		502.7	1,525.4		
May-10	981.3		277.7	1,021.9		
Jun-10	909.5		142.7	906.2		
Jul-10	805.3		70.8	826.6		
Aug-10	701.3		119.6	732.1		
Sep-10	761.2		316.8	750.7		
Oct-10	955.8		501.8	1,015.9		
Nov-10	2208.1		904.2	2,263.2		
Dec-10	1918.5	16,304.5	1292.1	1,810.5	16,614.7	
Jan-11	1948.1		1201.0	1,997.1		
Feb-11	1555.6		1004.6	1,530.8		
Mar-11	1935.8		1032.9	1,791.6		
Apr-11	1336.3		587.5	1,297.7		
May-11	1066.7		271.1	1,114.0		
Jun-11	1184.8		143.1	1,181.1		
Jul-11	821.9		104.4	808.9		
Aug-11	976.2		195.1	929.9		
Sep-11	1106.9		292.4	1,121.4		
Nov-11	1376.2		511.9	1,426.0		
Nov-11	1773.3		1059.1	1,670.1		
Dec-11	1927.2	17,008.9	1006.3	2,111.1	16,979.8	
Jan-12	2413.2		1273.0	2,388.6		
Feb-12	2073.2		935.5	2,119.0		
Mar-12	1897.6		909.0	1,880.1		
Apr-12	1650.1		512.6	1,688.1		
May-12	1411.6		340.2	1,388.3		
Jun-12	1312.7		149.7	1,302.3		
Jul-12	1180.0		77.8	1,194.2		
Aug-12	1147.4		134.0	1,163.6		
Sep-12	1118.7		278.8	1,147.1		
Oct-12	1478.3		714.5	1,321.0		
Nov-12	1623.2		1112.8	1,465.1		
Dec-12	2189.1	19,495.1	1356.2	2,015.5	19,072.9	

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Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-13	2,640.5		1,129.1	2,763.0		
Feb-13	1,772.1		765.8	1,991.3		
Mar-13	1,762.4		950.7	1,702.2		
Apr-13	1,883.1		690.1	1,739.8		
May-13	1,268.9		304.5	1,282.1		
Jun-13	1,256.9		96.3	1,301.0		
Jul-13	1,342.2		105.1	1,328.5		
Aug-13	1,380.3		82.2	1,449.3		
Sep-13	877.8		239.1	946.8		
Oct-13	1,377.9		490.2	1,449.8		
Nov-13	1,375.0		1,021.3	1,310.4		
Dec-13	1,786.6	18,723.6	1,248.8	1,722.8	18,987.0	
Jan-14	2,146.3		937.7	2,464.4		
Feb-14	1,728.9		1,204.4	1,499.9		
Mar-14	1,930.2		1,008.9	1,810.6		
Apr-14	1,482.2		570.5	1,461.1		
May-14	1,343.6		331.1	1,329.6		
Jun-14	1,134.6		186.8	1,086.2		
Jul-14	1,168.9		87.6	1,173.1		
Aug-14	1,018.4		144.8	1,023.5		
Sep-14	993.6		295.8	1,004.6		
Oct-14	1,146.1		539.7	1,167.4		
Nov-14	1,159.9		936.4	1,182.1		
Dec-14	2,014.4	17,267.1	1,176.7	2,024.2	17,226.8	
Jan-15	2,433.7		1,022.8	2,664.9		
Feb-15	2,010.6		956.7	2,034.8		
Mar-15	1,780.9		766.3	1,909.2		
Apr-15	1,837.2		497.4	1,890.8		
May-15	1,508.6		210.8	1,617.5		
Jun-15	978.0		111.8	1,006.3		
Jul-15	1,049.7		92.4	1,049.0		
Aug-15	809.9		147.5	812.3		
Sep-15	1,284.5		336.1	1,254.4		
Oct-15	864.1		523.7	901.8		
Nov-15	1,657.5		887.8	1,729.3		
Dec-15	1,889.3	18,104.2	1,160.3	1,915.9	18,786.2	
Jan-16	2,282.4		1,099.3	2,435.4		
Feb-16	1,873.7		930.8	1,924.3		
Mar-16	1,793.8		724.3	1,965.0		
Apr-16	1,806.6					
May-16	1,483.4					
Jun-16	961.7					
Jul-16	1,032.2					
Aug-16	796.4					
Sep-16	1,263.1					
Oct-16	849.7					
Nov-16	1,629.9					
Dec-16	1,857.8	17,630.8			18,005.5	
Jan-17	2,244.3					
Feb-17	1,842.5					
Mar-17	1,763.9					
Apr-17	1,776.4					
May-17	1,458.7					
Jun-17	945.6					
Jul-17	1,015.0					
Aug-17	783.1					
Sep-17	1,242.0					
Oct-17	835.5					
Nov-17	1,602.7					
Dec-17	1,826.8	17,336.7			17,336.7	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ { (1 / (2015 - 2013)) - 1} =$$

$$= (18,104.2 / 18,723.6) ^ { (1/2) - 1} = \mathbf{-1.7\%}$$

Note: January, February and March 2016 have been updated to include actuals.

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Annual			Annual		
Commercial	Actual / Forecast (Watson Lake)		Normalized	Normalized	
Monthly	UPC (kWh)	UPC (kWh)	MHDD	UPC (kWh)	UPC (kWh)
Jan-95	1577.5		938.7	1,693.0	
Feb-95	1137.2		941.9	1,151.5	
Mar-95	1205.1		855.6	1,218.6	
Apr-95	913.1		492.7	934.3	
May-95	757.3		242.5	785.2	
Jun-95	1023.3		97.0	1,039.1	
Jul-95	1383.0		113.0	1,375.1	
Aug-95	1256.4		189.9	1,241.5	
Sep-95	1093.8		224.9	1,124.2	
Oct-95	1402.3		552.7	1,405.2	
Nov-95	1464.8		1000.2	1,449.2	
Dec-95	1352.0	14,565.7	1295.4	1,311.4	14,728.1
Jan-96	1663.4		1605.2	1,530.8	
Feb-96	1299.7		947.3	1,312.0	
Mar-96	1369.5		874.3	1,376.0	
Apr-96	1125.7		547.7	1,126.5	
May-96	884.1		366.4	865.9	
Jun-96	1273.8		163.9	1,264.7	
Jul-96	1315.3		103.3	1,311.0	
Aug-96	1333.7		185.1	1,320.5	
Sep-96	1254.6		354.7	1,236.7	
Oct-96	1053.4		662.2	1,015.5	
Nov-96	1049.5		1121.2	988.8	
Dec-96	1042.8	14,665.4	1361.1	977.8	14,326.1
Jan-97	1387.6		1406.6	1,328.9	
Feb-97	1171.7		884.8	1,207.3	
Mar-97	996.0		943.9	976.6	
Apr-97	790.3		527.9	798.4	
May-97	800.0		311.8	802.1	
Jun-97	1155.6		142.6	1,154.5	
Jul-97	1291.3		84.1	1,294.1	
Aug-97	1289.3		109.6	1,304.3	
Sep-97	1321.3		271.1	1,334.5	
Oct-97	1366.4		659.7	1,329.5	
Nov-97	1388.7		935.8	1,397.0	
Dec-97	970.1	13,928.2	983.7	1,045.5	13,972.6
Jan-98	1404.6		1409.7	1,344.8	
Feb-98	1190.2		942.0	1,204.5	
Mar-98	922.5		843.4	940.6	
Apr-98	742.3		500.1	760.8	
May-98	975.4		211.0	1,015.1	
Jun-98	1242.8		89.0	1,261.5	
Jul-98	1453.8		65.7	1,463.4	
Aug-98	1536.4		156.8	1,533.7	
Sep-98	1329.6		320.7	1,324.4	
Oct-98	1345.9		561.2	1,345.7	
Nov-98	1496.6		958.1	1,496.6	
Dec-98	1252.9	14,893.0	1252.7	1,228.2	14,919.2
Jan-99	1591.1		1350.2	1,553.4	
Feb-99	1082.2		1066.4	1,050.2	
Mar-99	1136.4		871.4	1,144.0	
Apr-99	1173.6		506.4	1,189.8	
May-99	1129.2		372.2	1,108.8	
Jun-99	1407.1		140.2	1,406.9	
Jul-99	1514.8		99.4	1,512.0	
Aug-99	1785.3		127.8	1,793.5	
Sep-99	1489.0		292.5	1,494.3	
Oct-99	1310.3		519.8	1,325.4	
Nov-99	1643.7		939.9	1,650.5	
Dec-99	1431.1	16,693.9	1013.0	1,495.6	16,724.3
Jan-00	1781.4		1344.8	1,745.7	
Feb-00	1334.4		956.0	1,343.4	
Mar-00	1217.2		750.1	1,270.0	
Apr-00	1192.3		590.9	1,177.0	
May-00	949.0		373.8	928.0	
Jun-00	1262.1		158.0	1,255.2	
Jul-00	1550.9		84.3	1,553.6	
Aug-00	1573.9		216.9	1,548.9	
Sep-00	1616.0		314.8	1,612.9	
Oct-00	1394.6		575.8	1,388.9	
Nov-00	1341.9		858.4	1,379.0	
Dec-00	1316.4	16,530.0	1222.8	1,302.8	16,505.5

Regression Output:									
SUMMARY OUTPUT									
Regression Statistics									
Multiple R	0.425346673								
R Square	0.180919793								
Adjusted R Square	0.176318218								
Standard Error	324.2065466								
Observations	180								
ANOVA									
	df	SS	MS	F	Significance F				
Regression	1	4132598.484	4132598.484	39.31693474	2.64919E-09				
Residual	178	18709559.5	105109.8849						
Total	179	22842157.99							
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	
Intercept	1087.214207	43.59299811	24.9401109	5.52092E-60	1001.188618	1173.239797	1001.188618	1173.239797	
WL-HDD	0.372244828	0.059366145	6.270321741	2.64919E-09	0.255092812	0.489396843	0.255092812	0.489396843	

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Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)	MHDD	UPC (kWh)	Normalized UPC (kWh)	
Jan-01	1373.8		1043.4	1,450.3		
Feb-01	1033.4		1031.0	1,014.5		
Mar-01	1316.4		844.9	1,333.9		
Apr-01	856.4		535.8	861.6		
May-01	812.9		366.6	794.6		
Jun-01	1416.1		155.5	1,410.1		
Jul-01	1522.8		120.3	1,512.1		
Aug-01	1646.2		120.6	1,657.1		
Sep-01	1565.2		299.6	1,567.8		
Oct-01	1366.0		577.0	1,359.9		
Nov-01	1509.1		975.0	1,502.8		
Dec-01	1425.4	15,843.6	1275.4	1,392.2	15,857.0	
Jan-02	1219.4		1246.3	1,220.4		
Feb-02	1142.0		970.3	1,145.7		
Mar-02	1088.3		991.6	1,051.2		
Apr-02	948.5		694.8	894.5		
May-02	697.4		365.9	679.4		
Jun-02	1108.1		147.8	1,105.0		
Jul-02	1316.1		121.6	1,305.0		
Aug-02	1512.5		181.5	1,500.7		
Sep-02	1168.5		331.0	1,159.4		
Oct-02	1170.9		514.8	1,188.0		
Nov-02	1382.1		821.9	1,432.8		
Dec-02	1386.0	14,139.8	1117.9	1,411.5	14,093.5	
Jan-03	1617.3		1177.5	1,643.9		
Feb-03	1022.3		964.7	1,028.1		
Mar-03	1054.9		899.5	1,052.1		
Apr-03	962.9		554.4	961.2		
May-03	754.4		341.6	745.4		
Jun-03	1044.5		179.9	1,029.5		
Jul-03	1190.3		56.6	1,203.3		
Aug-03	2072.5		163.0	2,067.5		
Sep-03	294.4		330.2	285.6		
Oct-03	1245.6		526.1	1,258.5		
Nov-03	1351.8		963.9	1,349.6		
Dec-03	1101.4	13,712.2	1095.5	1,135.2	13,759.9	
Jan-04	1101.4		1365.6	1,058.0		
Feb-04	984.8		881.2	1,021.7		
Mar-04	811.5		809.9	842.0		
Apr-04	896.4		497.4	915.9		
May-04	771.7		292.3	781.0		
Jun-04	989.8		74.1	1,014.1		
Jul-04	1466.2		35.6	1,487.0		
Aug-04	1275.8		145.7	1,277.3		
Sep-04	1392.9		370.7	1,369.0		
Oct-04	1427.2		565.0	1,425.6		
Nov-04	1157.1		875.5	1,187.8		
Dec-04	1016.8	13,291.5	1070.7	1,059.8	13,439.3	
Jan-05	1533.1		1330.3	1,502.9		
Feb-05	1206.4		941.8	1,220.7		
Mar-05	903.3		726.9	964.7		
Apr-05	1244.1		464.8	1,275.8		
May-05	906.1		256.9	928.7		
Jun-05	1067.3		126.6	1,072.1		
Jul-05	1394.6		136.9	1,377.8		
Aug-05	1490.2		162.2	1,485.5		
Sep-05	1650.3		297.3	1,653.7		
Oct-05	1562.5		541.7	1,569.6		
Nov-05	1531.3		758.4	1,605.7		
Dec-05	1203.5	15,692.8	1061.0	1,250.2	15,907.3	
Jan-06	1783.7		1185.2	1,807.4		
Feb-06	1406.1		1016.7	1,392.5		
Mar-06	1521.9		960.5	1,496.4		
Apr-06	1434.3		528.2	1,442.4		
May-06	850.1		371.1	830.1		
Jun-06	1101.1		136.5	1,102.2		
Jul-06	1084.3		79.2	1,088.9		
Aug-06	980.6		171.7	972.4		
Sep-06	1112.8		292.4	1,118.1		
Oct-06	1337.8		543.3	1,344.2		
Nov-06	1323.2		1196.2	1,234.6		
Dec-06	1670.5	15,606.4	1050.0	1,721.2	15,550.5	

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Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)	MHDD	UPC (kWh)	Normalized UPC (kWh)	
Jan-07	1633.3		1102.4	1,687.9		
Feb-07	1295.4		1017.3	1,281.6		
Mar-07	1392.0		1001.9	1,351.0		
Apr-07	1347.5		543.0	1,350.1		
May-07	832.4		332.2	826.9		
Jun-07	1143.2		122.6	1,149.4		
Jul-07	1345.2		88.6	1,346.3		
Aug-07	1128.4		143.1	1,130.9		
Sep-07	1223.0		314.7	1,219.9		
Oct-07	1040.8		553.1	1,043.6		
Nov-07	1395.4		956.6	1,396.0		
Dec-07	1506.8	15,283.3	1255.1	1,481.2	15,264.8	
Jan-08	2017.4		1300.1	1,998.4		
Feb-08	2119.8		1064.2	2,088.6		
Mar-08	1443.4		833.3	1,465.2		
Apr-08	1598.6		554.0	1,597.1		
May-08	936.2		295.6	944.3		
Jun-08	954.5		191.0	935.3		
Jul-08	1208.6		131.5	1,193.7		
Aug-08	1188.7		154.0	1,187.1		
Sep-08	1298.1		304.2	1,299.0		
Oct-08	1081.0		523.5	1,094.8		
Nov-08	1334.4		882.5	1,362.5		
Dec-08	1452.2	16,632.8	1386.5	1,377.7	16,543.7	
Jan-09	2330.9		1329.3	2,301.0		
Feb-09	1921.3		1089.5	1,880.6		
Mar-09	1957.3		1054.2	1,896.9		
Apr-09	1767.1		590.0	1,752.1		
May-09	791.1		356.0	776.8		
Jun-09	1182.4		131.2	1,185.4		
Jul-09	1132.8		89.0	1,133.8		
Aug-09	1444.2		134.4	1,449.9		
Sep-09	1134.4		279.4	1,144.5		
Oct-09	1379.6		606.9	1,362.4		
Nov-09	1952.9		996.5	1,938.6		
Dec-09	1714.3	18,708.2	1340.7	1,656.9	18,478.9	
Jan-10	1973.3		1219.7	1,984.2		
Feb-10	1653.1		965.8	1,658.5		
Mar-10	1650.3		763.5	1,698.0		
Apr-10	1668.7		502.7	1,686.3		
May-10	913.5		277.7	928.3		
Jun-10	1124.2		142.7	1,123.0		
Jul-10	1091.3		70.8	1,099.1		
Aug-10	1188.8		119.6	1,200.0		
Sep-10	261.1		316.8	257.3		
Oct-10	2328.9		501.8	2,350.8		
Nov-10	1460.2		904.2	1,480.2		
Dec-10	1493.8	16,807.2	1292.1	1,454.5	16,920.2	
Jan-11	1722.7		1201.0	1,740.6		
Feb-11	1348.0		1004.6	1,339.0		
Mar-11	1579.0		1032.9	1,526.5		
Apr-11	1109.6		587.5	1,095.6		
May-11	1024.8		271.1	1,042.1		
Jun-11	984.9		143.1	983.5		
Jul-11	1087.3		104.4	1,082.6		
Aug-11	1305.0		195.1	1,288.2		
Sep-11	1017.1		292.4	1,022.4		
Nov-11	1152.9		511.9	1,171.0		
Nov-11	1594.7		1059.1	1,557.1		
Dec-11	1622.6	15,548.6	1006.3	1,689.6	15,538.0	
Jan-12	2074.1		1273.0	2,065.1		
Feb-12	1523.9		935.5	1,540.5		
Mar-12	1463.8		909.0	1,457.4		
Apr-12	1412.1		512.6	1,426.0		
May-12	1028.9		340.2	1,020.5		
Jun-12	1174.4		149.7	1,170.5		
Jul-12	1284.2		77.8	1,289.4		
Aug-12	1207.9		134.0	1,213.7		
Sep-12	1144.4		278.8	1,154.8		
Oct-12	1205.2		714.5	1,147.9		
Nov-12	1333.9		1112.8	1,276.3		
Dec-12	2300.3	17,153.0	1356.2	2,237.1	16,999.2	

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Upper Liard

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake)	MHDD	UPC (kWh)	UPC (kWh)	
Jan-13	2,580.4		1,129.1	2,625.0		
Feb-13	1,867.5		765.8	1,947.3		
Mar-13	1,806.4		950.7	1,784.5		
Apr-13	1,877.5		690.1	1,825.3		
May-13	1,384.7		304.5	1,389.6		
Jun-13	1,122.6		96.3	1,138.7		
Jul-13	1,324.2		105.1	1,319.2		
Aug-13	1,260.5		82.2	1,285.6		
Sep-13	1,045.0		239.1	1,070.1		
Oct-13	1,052.5		490.2	1,078.7		
Nov-13	1,256.1		1,021.3	1,232.6		
Dec-13	2,312.2	18,889.5	1,248.8	2,288.9	18,985.4	
Jan-14	1,907.7		937.7	2,023.6		
Feb-14	1,040.7		1,204.4	957.3		
Mar-14	1,346.8		1,008.9	1,303.3		
Apr-14	1,530.5		570.5	1,522.8		
May-14	1,260.2		331.1	1,255.1		
Jun-14	967.4		186.8	949.7		
Jul-14	1,167.2		87.6	1,168.7		
Aug-14	1,011.7		144.8	1,013.6		
Sep-14	1,062.0		295.8	1,066.0		
Oct-14	1,020.7		539.7	1,028.5		
Nov-14	1,324.1		936.4	1,332.1		
Dec-14	1,396.0	15,035.0	1,176.7	1,399.6	15,020.3	
Jan-15	1,242.5		1,022.8	1,326.7		
Feb-15	1,042.5		956.7	1,051.3		
Mar-15	878.7		766.3	925.5		
Apr-15	1,043.4		497.4	1,062.9		
May-15	1,227.2		210.8	1,266.9		
Jun-15	1,089.6		111.8	1,099.9		
Jul-15	1,410.8		92.4	1,410.5		
Aug-15	1,476.9		147.5	1,477.7		
Sep-15	1,455.5		336.1	1,444.5		
Oct-15	1,322.9		523.7	1,336.6		
Nov-15	1,198.9		887.8	1,225.1		
Dec-15	916.0	14,304.9	1,160.3	925.7	14,553.3	
Jan-16	1,615.0		1,099.3	1,670.7		
Feb-16	518.1		930.8	536.6		
Mar-16	970.0		724.3	1,032.4		
Apr-16	908.0					
May-16	1,068.0					
Jun-16	948.2					
Jul-16	1,227.7					
Aug-16	1,285.2					
Sep-16	1,266.6					
Oct-16	1,151.2					
Nov-16	1,043.3					
Dec-16	797.1	12,798.5			12,935.0	
Jan-17	1,405.4					
Feb-17	450.9					
Mar-17	844.1					
Apr-17	790.2					
May-17	929.4					
Jun-17	825.2					
Jul-17	1,068.4					
Aug-17	1,118.4					
Sep-17	1,102.2					
Oct-17	1,001.8					
Nov-17	907.9					
Dec-17	693.7	11,137.6			11,137.6	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^ {1/(2015 - 2013)} - 1 =$$

$$= (14,304.9 / 18,889.5) ^ {1/2} - 1 = -13.0\%$$

Note: January, February and March 2016 have been updated to include actuals.

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Watson Lake

Commercial Monthly	Annual		MHDD	Annual		Regression Output:																																																		
	UPC (kWh)	Actual / Forecast (Watson Lake)		UPC (kWh)	UPC (kWh)																																																			
Jan-95	3346.4		938.7	3,609.8	SUMMARY OUTPUT Regression Statistics Multiple R0.717130758 R Square0.514276524 Adjusted R Square0.51154774 Standard Error337.731131 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>21496601.05</td><td>21496601.05</td><td>188.4636542</td><td>1.01602E-29</td></tr><tr><td>Residual</td><td>178</td><td>20303092.4</td><td>114062.3169</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>41799693.45</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>2577.30426</td><td>45.41152148</td><td>56.75441334</td><td>6.0824E-116</td><td>2487.690032</td><td>2666.918489</td><td>2487.690032</td><td>2666.918489</td></tr><tr><td>WL-HDD</td><td>0.848988806</td><td>0.06184266</td><td>13.72820652</td><td>1.01602E-29</td><td>0.726949683</td><td>0.971027929</td><td>0.726949683</td><td>0.971027929</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	21496601.05	21496601.05	188.4636542	1.01602E-29	Residual	178	20303092.4	114062.3169			Total	179	41799693.45					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	2577.30426	45.41152148	56.75441334	6.0824E-116	2487.690032	2666.918489	2487.690032	2666.918489	WL-HDD	0.848988806	0.06184266	13.72820652	1.01602E-29	0.726949683	0.971027929	0.726949683	0.971027929
	df	SS	MS	F		Significance F																																																		
Regression	1	21496601.05	21496601.05	188.4636542		1.01602E-29																																																		
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	2577.30426	45.41152148	56.75441334	6.0824E-116		2487.690032	2666.918489	2487.690032	2666.918489																																															
WL-HDD	0.848988806	0.06184266	13.72820652	1.01602E-29		0.726949683	0.971027929	0.726949683	0.971027929																																															
Feb-95	3020.3		941.9	3,052.9																																																				
Mar-95	3015.1		855.6	3,045.9																																																				
Apr-95	2675.0		492.7	2,723.5																																																				
May-95	2344.9		242.5	2,408.6																																																				
Jun-95	2547.5		97.0	2,583.5																																																				
Jul-95	2534.4		113.0	2,516.3																																																				
Aug-95	2468.8		189.9	2,434.8																																																				
Sep-95	2688.5		224.9	2,757.9																																																				
Oct-95	2745.7		552.7	2,752.4																																																				
Nov-95	2950.2		1000.2	2,914.5																																																				
Dec-95	3129.7	33,466.7	1295.4	3,037.1	33,837.2																																																			
Jan-96	3699.1		1605.2	3,396.7																																																				
Feb-96	3389.2		947.3	3,417.2																																																				
Mar-96	3245.4		874.3	3,260.3																																																				
Apr-96	2679.3		547.7	2,681.1																																																				
May-96	2366.7		366.4	2,325.2																																																				
Jun-96	2679.0		163.9	2,658.3																																																				
Jul-96	2705.8		103.3	2,696.0																																																				
Aug-96	2460.2		185.1	2,430.2																																																				
Sep-96	2568.3		354.7	2,527.5																																																				
Oct-96	2460.3		662.2	2,374.0																																																				
Nov-96	3026.2		1121.2	2,887.7																																																				
Dec-96	3129.6	34,409.2	1361.1	2,981.2	33,635.4																																																			
Jan-97	3488.3		1406.6	3,354.5																																																				
Feb-97	3230.7		884.8	3,311.8																																																				
Mar-97	2798.8		943.9	2,754.6																																																				
Apr-97	2725.9		527.9	2,744.5																																																				
May-97	2371.0		311.8	2,375.8																																																				
Jun-97	2643.0		142.6	2,640.4																																																				
Jul-97	2647.5		84.1	2,653.9																																																				
Aug-97	2863.4		109.6	2,897.5																																																				
Sep-97	2270.7		271.1	2,300.9																																																				
Oct-97	2612.5		659.7	2,528.4																																																				
Nov-97	2845.6		935.8	2,864.5																																																				
Dec-97	2835.9	33,333.3	983.7	3,007.9	33,434.7																																																			
Jan-98	3554.7		1409.7	3,418.3																																																				
Feb-98	3071.9		942.0	3,104.4																																																				
Mar-98	2923.1		843.4	2,964.2																																																				
Apr-98	2738.1		500.1	2,780.3																																																				
May-98	2355.9		211.0	2,446.2																																																				
Jun-98	2597.2		89.0	2,640.1																																																				
Jul-98	2514.8		65.7	2,536.8																																																				
Aug-98	2494.7		156.8	2,488.7																																																				
Sep-98	2453.1		320.7	2,441.2																																																				
Oct-98	2550.4		561.2	2,549.9																																																				
Nov-98	2959.9		958.1	2,959.8																																																				
Dec-98	2832.8	33,046.5	1252.7	2,776.4	33,106.5																																																			
Jan-99	3402.8		1350.2	3,316.9																																																				
Feb-99	2905.2		1066.4	2,832.2																																																				
Mar-99	2635.3		871.4	2,652.6																																																				
Apr-99	2891.2		506.4	2,928.1																																																				
May-99	2610.3		372.2	2,563.8																																																				
Jun-99	2733.6		140.2	2,732.9																																																				
Jul-99	2893.8		99.4	2,887.2																																																				
Aug-99	2894.1		127.8	2,912.8																																																				
Sep-99	2682.2		292.5	2,694.2																																																				
Oct-99	2477.1		519.8	2,511.7																																																				
Nov-99	2762.7		939.9	2,778.2																																																				
Dec-99	2939.6	33,827.9	1013.0	3,086.8	33,897.4																																																			
Jan-00	4039.6		1344.8	3,958.2																																																				
Feb-00	3598.0		956.0	3,618.6																																																				
Mar-00	2945.6		750.1	3,066.0																																																				
Apr-00	3048.4		590.9	3,013.5																																																				
May-00	2891.1		373.8	2,843.2																																																				
Jun-00	3001.4		158.0	2,985.7																																																				
Jul-00	3104.5		84.3	3,110.8																																																				
Aug-00	3002.1		216.9	2,945.1																																																				
Sep-00	2935.9		314.8	2,928.9																																																				
Oct-00	2862.7		575.8	2,849.8																																																				
Nov-00	3114.6		858.4	3,199.2																																																				
Dec-00	3253.5	37,797.3	1222.8	3,222.5	37,741.5																																																			

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Watson Lake

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-01	3785.0		1043.4	3,959.5		
Feb-01	3290.2		1031.0	3,247.1		
Mar-01	3323.9		844.9	3,363.8		
Apr-01	3633.6		535.8	3,645.5		
May-01	1831.4		366.6	1,789.7		
Jun-01	3001.0		155.5	2,987.4		
Jul-01	2790.7		120.3	2,766.4		
Aug-01	2795.7		120.6	2,820.5		
Sep-01	2557.3		299.6	2,563.3		
Oct-01	2912.2		577.0	2,898.3		
Nov-01	3164.3		975.0	3,150.0		
Dec-01	3463.9	36,549.1	1275.4	3,388.3	36,579.6	
Jan-02	3549.4		1246.3	3,551.7		
Feb-02	3427.4		970.3	3,435.9		
Mar-02	3161.1		991.6	3,076.4		
Apr-02	3156.3		694.8	3,033.2		
May-02	2764.3		365.9	2,723.2		
Jun-02	2917.3		147.8	2,910.3		
Jul-02	3891.9		121.6	3,866.5		
Aug-02	2023.9		181.5	1,996.9		
Sep-02	2653.5		331.0	2,632.8		
Oct-02	3145.2		514.8	3,184.1		
Nov-02	3372.0		821.9	3,487.7		
Dec-02	3407.0	37,469.3	1117.9	3,465.1	37,363.6	
Jan-03	4163.0		1177.5	4,223.7		
Feb-03	2446.3		964.7	2,459.5		
Mar-03	3209.3		899.5	3,202.8		
Apr-03	2973.0		554.4	2,969.1		
May-03	2678.0		341.6	2,657.5		
Jun-03	2736.9		179.9	2,702.6		
Jul-03	2855.7		56.6	2,885.5		
Aug-03	2564.4		163.0	2,553.2		
Sep-03	2892.8		330.2	2,872.8		
Oct-03	2833.6		526.1	2,862.9		
Nov-03	3388.8		963.9	3,383.8		
Dec-03	3659.4	36,401.3	1095.5	3,736.5	36,510.0	
Jan-04	3690.7		1365.6	3,591.7		
Feb-04	3651.1		881.2	3,735.3		
Mar-04	3350.1		809.9	3,419.7		
Apr-04	3287.8		497.4	3,332.3		
May-04	2473.0		292.3	2,494.3		
Jun-04	2966.7		74.1	3,022.2		
Jul-04	3113.1		35.6	3,160.8		
Aug-04	2883.7		145.7	2,887.2		
Sep-04	2891.7		370.7	2,837.3		
Oct-04	3024.0		565.0	3,020.2		
Nov-04	3310.8		875.5	3,380.9		
Dec-04	3510.9	38,153.6	1070.7	3,609.0	38,490.9	
Jan-05	3929.2		1330.3	3,860.1		
Feb-05	3397.9		941.8	3,430.6		
Mar-05	3262.4		726.9	3,402.5		
Apr-05	3013.4		464.8	3,085.6		
May-05	2618.3		256.9	2,669.7		
Jun-05	2699.6		126.6	2,710.6		
Jul-05	3226.3		136.9	3,187.9		
Aug-05	2688.6		162.2	2,678.0		
Sep-05	3248.1		297.3	3,256.0		
Oct-05	2979.4		541.7	2,995.4		
Nov-05	3295.5		758.4	3,465.0		
Dec-05	3441.6	37,800.3	1061.0	3,548.0	38,289.5	
Jan-06	4410.9		1185.2	4,465.0		
Feb-06	2830.9		1016.7	2,800.0		
Mar-06	3183.0		960.5	3,124.7		
Apr-06	2987.1		528.2	3,005.4		
May-06	2640.0		371.1	2,594.4		
Jun-06	2828.1		136.5	2,830.6		
Jul-06	2874.7		79.2	2,885.3		
Aug-06	2644.4		171.7	2,625.8		
Sep-06	2802.5		292.4	2,814.6		
Oct-06	2916.1		543.3	2,930.7		
Nov-06	3442.9		1196.2	3,240.7		
Dec-06	3396.2	36,956.6	1050.0	3,511.9	36,829.3	

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Watson Lake

Commercial Monthly	Annual Actual / Forecast (Watson Lake)		Normalized UPC (kWh)	Annual Normalized UPC (kWh)		Regression Output:
	UPC (kWh)	UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-07	3759.4		1102.4	3,883.8		
Feb-07	3605.3		1017.3	3,573.9		
Mar-07	3537.2		1001.9	3,443.7		
Apr-07	3327.7		543.0	3,333.5		
May-07	2751.2		332.2	2,738.7		
Jun-07	3026.1		122.6	3,040.4		
Jul-07	2820.2		88.6	2,822.9		
Aug-07	2724.5		143.1	2,730.2		
Sep-07	2353.8		314.7	2,346.9		
Oct-07	2607.7		553.1	2,614.1		
Nov-07	3308.5		956.6	3,309.7		
Dec-07	3270.4	37,092.0	1255.1	3,212.0	37,049.8	
Jan-08	3448.4		1300.1	3,405.1		
Feb-08	3579.8		1064.2	3,508.6		
Mar-08	3297.2		833.3	3,346.9		
Apr-08	3024.2		554.0	3,020.6		
May-08	2807.5		295.6	2,826.0		
Jun-08	2577.9		191.0	2,534.1		
Jul-08	2785.1		131.5	2,751.3		
Aug-08	2886.2		154.0	2,882.6		
Sep-08	2328.1		304.2	2,330.2		
Oct-08	2584.3		523.5	2,615.8		
Nov-08	3267.9		882.5	3,332.1		
Dec-08	3211.5	35,798.0	1386.5	3,041.5	35,594.8	
Jan-09	3715.1		1329.3	3,647.0		
Feb-09	3259.6		1089.5	3,166.9		
Mar-09	3182.4		1054.2	3,044.6		
Apr-09	3067.7		590.0	3,033.6		
May-09	2766.9		356.0	2,734.2		
Jun-09	2533.8		131.2	2,540.8		
Jul-09	2795.5		89.0	2,797.8		
Aug-09	2653.6		134.4	2,666.7		
Sep-09	2493.1		279.4	2,516.2		
Oct-09	2994.4		606.9	2,955.1		
Nov-09	3873.6		996.5	3,841.0		
Dec-09	2691.4	36,027.1	1340.7	2,560.3	35,504.1	
Jan-10	3893.0		1219.7	3,917.9		
Feb-10	3665.4		965.8	3,677.7		
Mar-10	3349.5		763.5	3,458.4		
Apr-10	3234.8		502.7	3,274.8		
May-10	2478.0		277.7	2,511.8		
Jun-10	2373.1		142.7	2,370.3		
Jul-10	2633.7		70.8	2,651.5		
Aug-10	2473.7		119.6	2,499.3		
Sep-10	2558.8		316.8	2,550.1		
Oct-10	3119.2		501.8	3,169.1		
Nov-10	3012.6		904.2	3,058.3		
Dec-10	3302.1	36,093.8	1292.1	3,212.3	36,351.5	
Jan-11	3831.3		1201.0	3,872.1		
Feb-11	3148.8		1004.6	3,128.2		
Mar-11	3520.2		1032.9	3,400.4		
Apr-11	2987.1		587.5	2,955.1		
May-11	2658.4		271.1	2,697.7		
Jun-11	2447.6		143.1	2,444.6		
Jul-11	2387.3		104.4	2,376.5		
Aug-11	1930.7		195.1	1,892.2		
Sep-11	2474.5		292.4	2,486.6		
Oct-11	2655.4		511.9	2,696.8		
Nov-11	3100.2		1059.1	3,014.5		
Dec-11	3372.8	34,514.3	1006.3	3,525.6	34,490.2	
Jan-12	4100.1		1273.0	4,079.7		
Feb-12	3359.0		935.5	3,397.0		
Mar-12	3554.3		909.0	3,539.7		
Apr-12	3161.6		512.6	3,193.2		
May-12	2952.1		340.2	2,932.8		
Jun-12	2788.6		149.7	2,779.9		
Jul-12	2420.8		77.8	2,432.6		
Aug-12	2688.5		134.0	2,701.9		
Sep-12	3054.5		278.8	3,078.1		
Oct-12	1831.8		714.5	1,701.2		
Nov-12	3536.2		1112.8	3,404.9		
Dec-12	3810.5	37,258.0	1356.2	3,666.3	36,907.3	

ATCO Electric Yukon
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Watson Lake

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast UPC (kWh)	(Watson Lake) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-13	4,155.1		1,129.1	4,256.9		
Feb-13	3,609.9		765.8	3,792.0		
Mar-13	3,776.8		950.7	3,726.8		
Apr-13	3,507.1		690.1	3,388.0		
May-13	3,010.4		304.5	3,021.4		
Jun-13	2,795.4		96.3	2,832.1		
Jul-13	2,585.7		105.1	2,574.3		
Aug-13	2,720.1		82.2	2,777.5		
Sep-13	2,414.7		239.1	2,472.0		
Oct-13	2,678.8		490.2	2,738.6		
Nov-13	3,090.9		1,021.3	3,037.3		
Dec-13	3,627.4	37,972.3	1,248.8	3,574.3	38,191.2	
Jan-14	4,237.6		937.7	4,501.8		
Feb-14	3,596.9		1,204.4	3,406.6		
Mar-14	3,855.1		1,008.9	3,755.7		
Apr-14	3,427.9		570.5	3,410.3		
May-14	3,394.0		331.1	3,382.4		
Jun-14	2,668.3		186.8	2,628.1		
Jul-14	3,015.0		87.6	3,018.4		
Aug-14	2,811.6		144.8	2,815.9		
Sep-14	2,721.4		295.8	2,730.6		
Oct-14	2,919.7		539.7	2,937.5		
Nov-14	3,198.0		936.4	3,216.4		
Dec-14	3,987.2	39,832.6	1,176.7	3,995.3	39,799.1	
Jan-15	4,362.2		1,022.8	4,554.3		
Feb-15	3,655.2		956.7	3,675.2		
Mar-15	3,474.4		766.3	3,581.0		
Apr-15	3,297.9		497.4	3,342.4		
May-15	3,178.7		210.8	3,269.3		
Jun-15	2,518.2		111.8	2,541.7		
Jul-15	2,966.9		92.4	2,966.3		
Aug-15	2,801.6		147.5	2,803.6		
Sep-15	2,907.1		336.1	2,882.1		
Oct-15	2,902.6		523.7	2,933.9		
Nov-15	3,591.4		887.8	3,651.0		
Dec-15	3,736.5	39,392.7	1,160.3	3,758.6	39,959.3	
Jan-16	4,315.3		1,099.3	4,442.4		
Feb-16	3,758.9		930.8	3,800.9		
Mar-16	3,769.2		724.3	3,911.4		
Apr-16	3,359.0					
May-16	3,237.6					
Jun-16	2,564.9					
Jul-16	3,021.9					
Aug-16	2,853.6					
Sep-16	2,961.0					
Oct-16	2,956.4					
Nov-16	3,657.9					
Dec-16	3,805.7	40,261.3			40,572.7	
Jan-17	4,395.2					
Feb-17	3,828.5					
Mar-17	3,839.0					
Apr-17	3,421.3					
May-17	3,297.6					
Jun-17	2,612.4					
Jul-17	3,077.9					
Aug-17	2,906.4					
Sep-17	3,015.9					
Oct-17	3,011.2					
Nov-17	3,725.7					
Dec-17	3,876.2	41,007.4			41,007.4	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (39,392.7 / 37,972.3) ^ (1/2) - 1 = **1.9%**

Note: January, February and March 2016 have been updated to include actuals.

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Section 2
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Keno City

Commercial Monthly	Annual		(Whitehorse)	Annual		Regression Output:																																																		
	UPC (kWh)	Actual / Forecast UPC (kWh)		Normalized UPC (kWh)	Normalized UPC (kWh)																																																			
Jan-95	586.2		1020.1	619.0	SUMMARY OUTPUT Regression Statistics Multiple R0.518073032 R Square0.268399667 Adjusted R Square0.264289553 Standard Error435.3606771 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>12377316.04</td><td>12377316.04</td><td>65.30224027</td><td>9.45711E-14</td></tr><tr><td>Residual</td><td>178</td><td>33737927.6</td><td>189538.9191</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>46115243.64</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>460.5059285</td><td>62.62699447</td><td>7.353153899</td><td>6.79703E-12</td><td>336.9190145</td><td>584.0928425</td><td>336.9190145</td><td>584.0928425</td></tr><tr><td>WH-HDD</td><td>0.795596225</td><td>0.098452936</td><td>8.080980155</td><td>9.45711E-14</td><td>0.601311082</td><td>0.989881368</td><td>0.601311082</td><td>0.989881368</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	12377316.04	12377316.04	65.30224027	9.45711E-14	Residual	178	33737927.6	189538.9191			Total	179	46115243.64					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	460.5059285	62.62699447	7.353153899	6.79703E-12	336.9190145	584.0928425	336.9190145	584.0928425	WH-HDD	0.795596225	0.098452936	8.080980155	9.45711E-14	0.601311082	0.989881368	0.601311082	0.989881368
	df	SS	MS	F		Significance F																																																		
Regression	1	12377316.04	12377316.04	65.30224027		9.45711E-14																																																		
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Total	179	46115243.64																																																						
	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	460.5059285	62.62699447	7.353153899	6.79703E-12		336.9190145	584.0928425	336.9190145	584.0928425																																															
WH-HDD	0.795596225	0.098452936	8.080980155	9.45711E-14		0.601311082	0.989881368	0.601311082	0.989881368																																															
Feb-95	560.9		840.1	544.0																																																				
Mar-95	870.3		880.0	800.8																																																				
Apr-95	1147.9		439.9	1,201.3																																																				
May-95	530.4		250.7	584.8																																																				
Jun-95	674.5		139.0	691.7																																																				
Jul-95	633.4		96.6	647.6																																																				
Aug-95	667.1		198.3	641.3																																																				
Sep-95	609.9		226.5	682.4																																																				
Oct-95	496.8		524.9	508.9																																																				
Nov-95	637.1		894.4	568.5																																																				
Dec-95	1160.6	8,575.1	1048.6	1,100.0	8,590.4																																																			
Jan-96	1244.4		1556.4	850.5																																																				
Feb-96	1113.7		835.8	1,100.2																																																				
Mar-96	1290.5		805.8	1,280.0																																																				
Apr-96	1232.1		526.0	1,217.0																																																				
May-96	891.6		357.3	861.2																																																				
Jun-96	530.8		193.6	504.6																																																				
Jul-96	691.1		124.9	682.8																																																				
Aug-96	667.2		227.3	618.3																																																				
Sep-96	708.5		362.6	672.7																																																				
Oct-96	689.3		679.9	578.2																																																				
Nov-96	1242.4		975.0	1,109.7																																																				
Dec-96	1649.6	11,951.2	1155.8	1,503.7	10,978.9																																																			
Jan-97	2120.2		1185.7	2,021.2																																																				
Feb-97	1819.5		656.5	1,948.7																																																				
Mar-97	1789.7		855.4	1,739.8																																																				
Apr-97	1926.9		484.0	1,945.2																																																				
May-97	779.3		331.1	769.8																																																				
Jun-97	547.1		148.9	556.5																																																				
Jul-97	646.7		92.8	663.9																																																				
Aug-97	685.2		130.0	713.7																																																				
Sep-97	640.1		282.1	668.4																																																				
Oct-97	857.3		641.0	777.1																																																				
Nov-97	805.2		694.0	896.1																																																				
Dec-97	750.1	13,367.3	762.0	917.5	13,617.8																																																			
Jan-98	1214.3		1165.7	1,131.3																																																				
Feb-98	1942.7		719.1	2,022.0																																																				
Mar-98	1605.9		756.6	1,634.6																																																				
Apr-98	1829.4		458.6	1,867.9																																																				
May-98	471.1		270.6	509.6																																																				
Jun-98	420.4		119.5	453.2																																																				
Jul-98	475.3		111.6	477.6																																																				
Aug-98	520.2		189.2	501.6																																																				
Sep-98	526.8		327.8	518.7																																																				
Oct-98	613.5		557.7	599.6																																																				
Nov-98	1282.5		792.3	1,295.2																																																				
Dec-98	1569.3	12,471.5	1051.8	1,506.1	12,517.5																																																			
Jan-99	2140.2		1183.1	2,043.3																																																				
Feb-99	1147.4		976.4	1,022.0																																																				
Mar-99	1669.6		734.0	1,716.2																																																				
Apr-99	1750.7		508.8	1,749.3																																																				
May-99	313.5		391.9	255.5																																																				
Jun-99	474.4		153.9	479.8																																																				
Jul-99	555.5		108.6	560.1																																																				
Aug-99	593.8		145.7	609.9																																																				
Sep-99	575.3		311.2	580.4																																																				
Oct-99	483.7		499.8	515.8																																																				
Nov-99	873.3		792.5	885.8																																																				
Dec-99	685.8	11,263.0	844.0	788.0	11,206.0																																																			
Jan-00	2145.6		1082.9	2,128.4																																																				
Feb-00	1665.6		735.2	1,732.1																																																				
Mar-00	1423.9		659.2	1,530.0																																																				
Apr-00	1484.3		515.6	1,477.5																																																				
May-00	885.0		382.0	834.9																																																				
Jun-00	501.4		172.5	492.0																																																				
Jul-00	511.5		142.1	489.5																																																				
Aug-00	561.7		219.9	518.7																																																				
Sep-00	498.0		354.2	468.9																																																				
Oct-00	603.6		539.2	604.4																																																				
Nov-00	544.8		691.2	637.9																																																				
Dec-00	619.6	11,444.9	977.8	615.3	11,529.7																																																			

ATCO Electric Yukon
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Section 2
Attachment 35

Keno City

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-01	2023.7		722.7	2,293.1		
Feb-01	1472.9		864.1	1,436.9		
Mar-01	1368.6		765.3	1,390.3		
Apr-01	1322.3		506.8	1,322.5		
May-01	1114.6		390.4	1,057.9		
Jun-01	294.3		167.3	289.0		
Jul-01	627.8		139.6	607.8		
Aug-01	164.6		139.6	185.5		
Sep-01	471.8		309.0	478.7		
Oct-01	309.3		573.4	282.9		
Nov-01	498.9		818.0	491.1		
Dec-01	1392.3	11,061.1	1094.6	1,295.1	11,130.7	
Jan-02	1461.7		935.6	1,561.7		
Feb-02	1177.8		824.6	1,173.2		
Mar-02	598.9		921.1	496.7		
Apr-02	737.0		653.3	620.6		
May-02	667.1		361.6	633.3		
Jun-02	505.9		175.6	494.0		
Jul-02	691.5		130.9	678.4		
Aug-02	428.6		182.8	415.1		
Sep-02	384.4		314.4	387.0		
Oct-02	314.9		444.3	391.2		
Nov-02	712.1		582.6	891.6		
Dec-02	667.9	8,347.8	845.2	769.1	8,512.0	
Jan-03	1322.0		989.1	1,379.5		
Feb-03	1796.2		756.6	1,845.7		
Mar-03	1807.6		834.5	1,774.3		
Apr-03	1850.4		514.3	1,844.6		
May-03	1296.2		363.7	1,260.7		
Jun-03	357.8		192.8	332.2		
Jul-03	500.2		84.4	524.1		
Aug-03	474.3		180.6	462.6		
Sep-03	589.0		359.2	555.9		
Oct-03	693.1		466.7	751.6		
Nov-03	1018.6		874.6	965.8		
Dec-03	1452.2	13,157.6	911.6	1,500.6	13,197.5	
Jan-04	1974.7		1257.9	1,818.3		
Feb-04	1714.8		697.2	1,811.6		
Mar-04	1632.0		753.5	1,663.1		
Apr-04	1944.1		466.6	1,976.2		
May-04	1341.3		272.5	1,378.4		
Jun-04	538.3		83.7	599.5		
Jul-04	418.3		74.2	450.3		
Aug-04	464.3		101.7	515.4		
Sep-04	592.0		367.5	552.3		
Oct-04	829.1		540.5	828.8		
Nov-04	1035.1		719.8	1,105.4		
Dec-04	983.1	13,467.0	899.5	1,041.1	13,740.5	
Jan-05	1861.8		1165.8	1,778.7		
Feb-05	663.9		795.2	682.7		
Mar-05	2698.7		613.7	2,841.1		
Apr-05	1748.5		453.3	1,791.3		
May-05	970.4		256.6	1,020.1		
Jun-05	322.3		154.4	327.3		
Jul-05	323.6		132.6	309.2		
Aug-05	367.3		150.8	379.3		
Sep-05	647.0		299.3	661.6		
Oct-05	504.0		534.6	508.5		
Nov-05	980.6		762.6	1,016.9		
Dec-05	1353.4	12,441.6	794.4	1,495.0	12,811.6	
Jan-06	1908.6		1096.2	1,880.9		
Feb-06	1521.3		821.3	1,519.3		
Mar-06	1708.2		906.3	1,617.7		
Apr-06	1668.1		519.1	1,658.5		
May-06	1420.7		346.9	1,398.6		
Jun-06	388.9		173.1	379.0		
Jul-06	400.7		118.4	397.6		
Aug-06	370.8		201.6	342.4		
Sep-06	389.9		295.7	407.3		
Oct-06	797.2		520.5	812.9		
Nov-06	646.1		1162.2	364.5		
Dec-06	2207.9	13,428.5	824.3	2,325.8	13,104.4	

ATCO Electric Yukon
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Keno City

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-07	2267.5		912.0	2,386.3		
Feb-07	1705.1		998.8	1,561.9		
Mar-07	1873.3		954.2	1,744.7		
Apr-07	1765.3		511.9	1,761.4		
May-07	1522.4		322.1	1,520.0		
Jun-07	414.0		140.5	430.1		
Jul-07	374.0		102.3	383.7		
Aug-07	469.5		154.2	478.7		
Sep-07	365.2		308.4	372.5		
Oct-07	708.5		543.7	705.8		
Nov-07	1070.8		724.6	1,137.4		
Dec-07	1351.2	13,886.6	1069.5	1,273.9	13,756.2	
Jan-08	1752.5		1113.8	1,710.7		
Feb-08	1740.4		954.6	1,632.3		
Mar-08	1350.1		734.7	1,396.1		
Apr-08	884.3		517.3	876.1		
May-08	534.7		307.9	543.6		
Jun-08	442.4		225.6	390.7		
Jul-08	493.3		173.4	446.4		
Aug-08	521.5		187.7	504.1		
Sep-08	489.5		318.7	488.7		
Oct-08	414.4		563.0	396.2		
Nov-08	654.2		782.5	674.7		
Dec-08	677.1	9,954.2	1186.2	507.0	9,566.7	
Jan-09	1217.2		1137.9	1,156.3		
Feb-09	902.9		955.4	794.3		
Mar-09	925.8		868.5	865.4		
Apr-09	1144.8		515.2	1,138.3		
May-09	914.3		331.2	904.6		
Jun-09	651.8		144.1	665.0		
Jul-09	314.9		62.5	356.3		
Aug-09	580.2		158.3	586.2		
Sep-09	523.6		306.1	532.7		
Oct-09	552.4		541.8	551.1		
Nov-09	681.8		781.5	703.1		
Dec-09	640.6	9,050.2	955.2	654.3	8,907.5	
Jan-10	812.8		991.1	868.7		
Feb-10	622.6		679.2	733.7		
Mar-10	1754.8		656.0	1,863.5		
Apr-10	1125.4		461.2	1,161.9		
May-10	349.6		292.0	371.1		
Jun-10	520.8		171.9	511.9		
Jul-10	501.0		117.3	498.8		
Aug-10	482.1		146.2	497.7		
Sep-10	616.3		332.4	604.6		
Oct-10	539.2		520.4	554.9		
Nov-10	717.4		717.6	789.5		
Dec-10	772.1	8,814.2	1162.5	620.9	9,077.1	
Jan-11	1079.7		1010.2	1,120.3		
Feb-11	836.2		905.6	767.1		
Mar-11	869.7		904.4	780.7		
Apr-11	1202.9		511.2	1,199.6		
May-11	1229.1		296.4	1,247.1		
Jun-11	1097.5		161.0	1,097.2		
Jul-11	676.4		127.8	665.8		
Aug-11	1571.7		218.3	1,529.9		
Sep-11	466.5		328.6	457.7		
Nov-11	1625.0		513.4	1,646.4		
Nov-11	954.4		936.1	852.7		
Dec-11	690.8	12,299.7	774.4	848.4	12,213.0	
Jan-12	2038.8		1118.1	1,993.6		
Feb-12	1093.5		691.7	1,194.6		
Mar-12	1289.5		756.2	1,318.5		
Apr-12	1081.8		450.6	1,126.7		
May-12	681.8		350.8	656.6		
Jun-12	844.4		195.1	817.0		
Jul-12	120.4		140.1	100.0		
Aug-12	429.9		157.9	436.3		
Sep-12	480.0		271.0	517.1		
Oct-12	444.5		639.3	365.7		
Nov-12	668.8		969.6	540.5		
Dec-12	599.8	9,773.4	1196.8	421.3	9,487.9	

ATCO Electric Yukon
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Keno City

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse)		UPC (kWh)	UPC (kWh)	
Jan-13	1,447.1		952.0	1,534.1		
Feb-13	1,028.6		665.4	1,150.7		
Mar-13	1,314.5		851.1	1,268.0		
Apr-13	1,260.5		639.9	1,154.7		
May-13	618.2		294.0	638.2		
Jun-13	509.5		112.4	547.9		
Jul-13	730.7		92.5	748.2		
Aug-13	595.7		98.9	649.0		
Sep-13	630.6		264.3	673.0		
Oct-13	67.8		501.4	98.7		
Nov-13	623.0		865.6	577.4		
Dec-13	670.3	9,496.5	1,144.7	533.2	9,572.9	
Jan-14	801.8		745.8	1,052.8		
Feb-14	891.8		992.4	753.7		
Mar-14	787.3		855.1	737.5		
Apr-14	747.2		499.8	753.0		
May-14	528.1		269.5	567.5		
Jun-14	566.4		200.5	534.7		
Jul-14	620.0		98.0	633.1		
Aug-14	386.5		144.0	403.9		
Sep-14	746.2		307.1	754.5		
Oct-14	475.6		515.6	495.1		
Nov-14	675.4		772.8	703.6		
Dec-14	758.5	7,984.6	854.4	852.4	8,241.8	
Jan-15	758.4		927.0	865.3		
Feb-15	866.9		851.4	841.0		
Mar-15	722.2		671.3	818.7		
Apr-15	627.4		453.5	670.0		
May-15	649.5		192.9	749.9		
Jun-15	202.6		127.2	229.3		
Jul-15	492.5		115.7	491.6		
Aug-15	553.7		183.2	539.9		
Sep-15	508.5		332.7	496.5		
Oct-15	548.4		469.8	604.4		
Nov-15	1,000.7		759.2	1,039.7		
Dec-15	710.6	7,641.5	947.9	730.1	8,076.3	
Jan-16	398.8		827.6	584.8		
Feb-16	940.4		688.0	1,044.5		
Mar-16	174.2		611.6	318.2		
Apr-16	562.8					
May-16	582.6					
Jun-16	181.8					
Jul-16	441.8					
Aug-16	496.7					
Sep-16	456.1					
Oct-16	491.9					
Nov-16	897.6					
Dec-16	637.4	6,262.4			6,696.4	
Jan-17	357.8					
Feb-17	843.6					
Mar-17	156.3					
Apr-17	504.9					
May-17	522.6					
Jun-17	163.1					
Jul-17	396.3					
Aug-17	445.6					
Sep-17	409.2					
Oct-17	441.3					
Nov-17	805.2					
Dec-17	571.8	5,617.5			5,617.5	

2 year Compound Annual Growth Rate =

$$= (2015 \text{ Actual UPC} / 2013 \text{ Actual UPC}) ^{(1/(2015 - 2013))} - 1 =$$

$$= (7,641.5 / 9,496.5) ^{(1/2)} - 1 = -10.3\%$$

Note: January, February and March 2016 have been updated to include actuals.

ATCO Electric Yukon
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Stewart Crossing

Commercial Monthly	Annual		(Whitehorse)	Annual		Regression Output:																																																		
	UPC (kWh)	Actual / Forecast		UPC (kWh)	UPC (kWh)																																																			
Jan-95	2,150.9		1,020.1	2,199.5	SUMMARY OUTPUT Regression Statistics Multiple R0.706148367 R Square0.498645516 Adjusted R Square0.495828918 Standard Error391.3222331 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>27110408.58</td><td>27110408.58</td><td>177.0382127</td><td>1.72873E-28</td></tr><tr><td>Residual</td><td>178</td><td>27257690.04</td><td>153133.0901</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>54368098.62</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>1095.416069</td><td>56.29202778</td><td>19.45952406</td><td>6.13228E-46</td><td>984.3304569</td><td>1206.50168</td><td>984.3304569</td><td>1206.50168</td></tr><tr><td>WL-HDD</td><td>1.17746364</td><td>0.088494035</td><td>13.30557074</td><td>1.72873E-28</td><td>1.002831203</td><td>1.352096077</td><td>1.002831203</td><td>1.352096077</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	27110408.58	27110408.58	177.0382127	1.72873E-28	Residual	178	27257690.04	153133.0901			Total	179	54368098.62					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	1095.416069	56.29202778	19.45952406	6.13228E-46	984.3304569	1206.50168	984.3304569	1206.50168	WL-HDD	1.17746364	0.088494035	13.30557074	1.72873E-28	1.002831203	1.352096077	1.002831203	1.352096077
	df	SS	MS	F		Significance F																																																		
Regression	1	27110408.58	27110408.58	177.0382127		1.72873E-28																																																		
Residual	178	27257690.04	153133.0901																																																					
Total	179	54368098.62																																																						
	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	1095.416069	56.29202778	19.45952406	6.13228E-46		984.3304569	1206.50168	984.3304569	1206.50168																																															
WL-HDD	1.17746364	0.088494035	13.30557074	1.72873E-28		1.002831203	1.352096077	1.002831203	1.352096077																																															
Feb-95	2,532.6		840.1	2,507.6																																																				
Mar-95	2,307.2		880.0	2,204.3																																																				
Apr-95	1,621.3		439.9	1,700.3																																																				
May-95	(1,368.9)		250.7	(1,288.4)																																																				
Jun-95	1,364.8		139.0	1,390.3																																																				
Jul-95	1,696.2		96.6	1,717.3																																																				
Aug-95	1,383.0		198.3	1,344.8																																																				
Sep-95	1,287.3		226.5	1,394.6																																																				
Oct-95	1,610.9		524.9	1,628.9																																																				
Nov-95	1,753.9		894.4	1,652.4																																																				
Dec-95	2,242.0	18,581.2	1,048.6	2,152.3	18,603.8																																																			
Jan-96	3,204.2		1,556.4	2,621.3																																																				
Feb-96	3,136.8		835.8	3,116.9																																																				
Mar-96	2,857.2		805.8	2,841.6																																																				
Apr-96	1,737.2		526.0	1,714.9																																																				
May-96	2,740.7		357.3	2,695.7																																																				
Jun-96	1,565.2		193.6	1,526.4																																																				
Jul-96	1,273.2		124.9	1,260.9																																																				
Aug-96	1,528.7		227.3	1,456.4																																																				
Sep-96	1,552.6		362.6	1,499.6																																																				
Oct-96	1,587.5		679.9	1,423.0																																																				
Nov-96	2,080.8		975.0	1,884.5																																																				
Dec-96	1,756.5	25,020.6	1,155.8	1,540.6		23,581.6																																																		
Jan-97	2,030.3		1,185.7	1,883.9																																																				
Feb-97	1,789.3		656.5	1,980.4																																																				
Mar-97	1,503.2		855.4	1,429.3																																																				
Apr-97	1,381.9		484.0	1,409.0																																																				
May-97	1,168.9		331.1	1,154.8																																																				
Jun-97	3,962.4		148.9	3,976.3																																																				
Jul-97	1,035.8		92.8	1,061.4																																																				
Aug-97	954.8		130.0	997.0																																																				
Sep-97	1,008.1		282.1	1,049.9																																																				
Oct-97	960.0		641.0	841.3																																																				
Nov-97	1,374.4		694.0	1,508.9																																																				
Dec-97	1,310.1	18,479.2	762.0	1,557.8		18,849.9																																																		
Jan-98	1,932.2		1,165.7	1,809.3																																																				
Feb-98	1,756.1		719.1	1,873.5																																																				
Mar-98	1,429.2		756.6	1,471.6																																																				
Apr-98	1,469.2		458.6	1,526.2																																																				
May-98	2,579.0		270.6	2,636.1																																																				
Jun-98	851.8		119.5	900.3																																																				
Jul-98	1,092.3		111.6	1,095.7																																																				
Aug-98	773.1		189.2	745.6																																																				
Sep-98	1,200.4		327.8	1,188.4																																																				
Oct-98	1,272.0		557.7	1,251.4																																																				
Nov-98	1,431.3		792.3	1,450.0																																																				
Dec-98	1,228.8	17,015.3	1,051.8	1,135.3		17,083.3																																																		
Jan-99	2,240.6		1,183.1	2,097.2																																																				
Feb-99	1,670.8		976.4	1,485.2																																																				
Mar-99	1,547.8		734.0	1,616.8																																																				
Apr-99	1,509.4		508.8	1,507.3																																																				
May-99	1,610.0		391.9	1,524.2																																																				
Jun-99	1,066.5		153.9	1,074.4																																																				
Jul-99	1,499.9		108.6	1,506.9																																																				
Aug-99	1,139.6		145.7	1,163.3																																																				
Sep-99	1,575.5		311.2	1,583.0																																																				
Oct-99	998.0		499.8	1,045.6																																																				
Nov-99	1,397.1		792.5	1,415.6																																																				
Dec-99	1,909.3	18,164.3	844.0	2,060.5		18,080.0																																																		
Jan-00	3,072.8		1,082.9	3,047.4																																																				
Feb-00	1,773.1		735.2	1,871.5																																																				
Mar-00	2,012.0		659.2	2,169.1																																																				
Apr-00	2,187.8		515.6	2,177.7																																																				
May-00	1,073.4		382.0	999.3																																																				
Jun-00	477.8		172.5	463.9																																																				
Jul-00	1,329.7		142.1	1,297.2																																																				
Aug-00	1,323.3		219.9	1,259.7																																																				
Sep-00	1,545.4		354.2	1,502.3																																																				
Oct-00	1,361.8		539.2	1,363.0																																																				
Nov-00	1,985.5		691.2	2,123.3																																																				
Dec-00	1,754.6	19,897.1	977.8	1,748.2		20,022.5																																																		

ATCO Electric Yukon
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Stewart Crossing

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)		Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-01	2,401.6		722.7	2,800.4		
Feb-01	1,845.0		864.1	1,791.7		
Mar-01	2,154.8		765.3	2,186.9		
Apr-01	1,081.1		506.8	1,081.3		
May-01	1,310.9		390.4	1,226.9		
Jun-01	1,720.4		167.3	1,712.6		
Jul-01	1,282.6		139.6	1,253.1		
Aug-01	1,142.4		139.6	1,173.4		
Sep-01	1,599.8		309.0	1,609.9		
Oct-01	1,483.2		573.4	1,444.1		
Nov-01	2,615.8		818.0	2,604.3		
Dec-01	2,243.3	20,880.8	1,094.6	2,099.4	20,983.9	
Jan-02	2,600.7		935.6	2,748.7		
Feb-02	2,768.9		824.6	2,762.1		
Mar-02	2,597.1		921.1	2,445.8		
Apr-02	2,272.1		653.3	2,099.8		
May-02	2,162.1		361.6	2,112.0		
Jun-02	1,579.9		175.6	1,562.4		
Jul-02	1,251.4		130.9	1,232.1		
Aug-02	1,634.2		182.8	1,614.3		
Sep-02	1,199.1		314.4	1,202.9		
Oct-02	1,620.6		444.3	1,733.5		
Nov-02	1,459.5		582.6	1,725.1		
Dec-02	1,857.5	23,003.2	845.2	2,007.3	23,246.1	
Jan-03	2,216.7		989.1	2,301.8		
Feb-03	1,900.5		756.6	1,973.8		
Mar-03	1,721.9		834.5	1,672.5		
Apr-03	1,938.6		514.3	1,930.0		
May-03	1,511.2		363.7	1,458.6		
Jun-03	1,280.4		192.8	1,242.6		
Jul-03	1,511.3		84.4	1,546.7		
Aug-03	1,221.5		180.6	1,204.2		
Sep-03	1,453.0		359.2	1,404.0		
Oct-03	1,807.1		466.7	1,893.6		
Nov-03	1,966.1		874.6	1,887.9		
Dec-03	2,877.7	21,406.0	911.6	2,949.3	21,465.1	
Jan-04	2,078.2		1,257.9	1,846.8		
Feb-04	2,729.6		697.2	2,872.9		
Mar-04	2,027.3		753.5	2,073.3		
Apr-04	1,681.9		466.6	1,729.5		
May-04	1,595.6		272.5	1,650.4		
Jun-04	1,932.5		83.7	2,023.2		
Jul-04	959.3		74.2	1,006.7		
Aug-04	1,310.5		101.7	1,386.0		
Sep-04	1,929.0		367.5	1,870.3		
Oct-04	1,095.4		540.5	1,095.0		
Nov-04	1,903.2		719.8	2,007.3		
Dec-04	2,112.5	21,355.0	899.5	2,198.3	21,759.6	
Jan-05	2,700.5		1,165.8	2,577.5		
Feb-05	1,781.8		795.2	1,809.6		
Mar-05	1,991.9		613.7	2,202.6		
Apr-05	1,904.2		453.3	1,967.5		
May-05	1,288.9		256.6	1,362.5		
Jun-05	1,352.1		154.4	1,359.5		
Jul-05	1,176.8		132.6	1,155.5		
Aug-05	1,226.6		150.8	1,244.4		
Sep-05	1,512.6		299.3	1,534.2		
Oct-05	1,224.9		534.6	1,231.4		
Nov-05	1,729.5		762.6	1,783.2		
Dec-05	2,071.5	19,961.2	794.4	2,281.1	20,508.8	
Jan-06	3,846.8		1,096.2	3,805.7		
Feb-06	2,681.0		821.3	2,678.1		
Mar-06	2,752.2		906.3	2,618.3		
Apr-06	1,727.4		519.1	1,713.1		
May-06	844.5		346.9	811.7		
Jun-06	1,436.2		173.1	1,421.5		
Jul-06	1,343.8		118.4	1,339.2		
Aug-06	1,079.0		201.6	1,036.9		
Sep-06	1,640.9		295.7	1,666.7		
Oct-06	1,450.0		520.5	1,473.2		
Nov-06	2,211.8		1,162.2	1,795.1		
Dec-06	2,409.2	23,422.9	824.3	2,583.6	22,943.3	

ATCO Electric Yukon
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Section 2
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Stewart Crossing

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Whitehorse) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-07	2,637.6		912.0	2,813.5		
Feb-07	1,916.9		998.8	1,704.9		
Mar-07	2,941.7		954.2	2,751.4		
Apr-07	1,673.2		511.9	1,667.4		
May-07	1,491.1		322.1	1,487.6		
Jun-07	1,441.0		140.5	1,464.8		
Jul-07	1,350.9		102.3	1,365.2		
Aug-07	1,455.7		154.2	1,469.4		
Sep-07	1,709.6		308.4	1,720.5		
Oct-07	998.3		543.7	994.2		
Nov-07	2,050.7		724.6	2,149.1		
Dec-07	1,422.3	21,089.1	1,069.5	1,308.0	20,896.1	
Jan-08	2,416.0		1,113.8	2,354.2		
Feb-08	3,206.7		954.6	3,046.8		
Mar-08	2,056.0		734.7	2,124.2		
Apr-08	1,188.7		517.3	1,176.6		
May-08	1,789.5		307.9	1,802.6		
Jun-08	1,427.3		225.6	1,350.8		
Jul-08	936.0		173.4	866.6		
Aug-08	1,395.8		187.7	1,370.1		
Sep-08	1,042.2		318.7	1,040.9		
Oct-08	1,461.5		563.0	1,434.6		
Nov-08	1,828.4		782.5	1,858.7		
Dec-08	2,054.1	20,802.1	1,186.2	1,802.4	20,228.6	
Jan-09	3,346.1		1,137.9	3,255.9		
Feb-09	2,575.1		955.4	2,414.3		
Mar-09	1,997.6		868.5	1,908.3		
Apr-09	1,668.7		515.2	1,659.1		
May-09	1,329.4		331.2	1,315.1		
Jun-09	1,203.0		144.1	1,222.5		
Jul-09	1,444.2		62.5	1,505.4		
Aug-09	1,264.8		158.3	1,273.7		
Sep-09	1,161.4		306.1	1,175.0		
Oct-09	1,270.5		541.8	1,268.6		
Nov-09	1,369.7		781.5	1,401.1		
Dec-09	1,642.5	20,273.1	955.2	1,662.7	20,061.8	
Jan-10	2,535.8		991.1	2,618.5		
Feb-10	2,055.0		679.2	2,219.4		
Mar-10	1,771.6		656.0	1,932.4		
Apr-10	1,732.4		461.2	1,786.3		
May-10	1,570.2		292.0	1,602.1		
Jun-10	1,078.5		171.9	1,065.3		
Jul-10	1,241.2		117.3	1,237.8		
Aug-10	1,286.2		146.2	1,309.3		
Sep-10	1,410.5		332.4	1,393.1		
Oct-10	2,427.2		520.4	2,450.5		
Nov-10	1,736.3		717.6	1,843.0		
Dec-10	2,079.4	20,924.2	1,162.5	1,855.6	21,313.4	
Jan-11	2,319.6		1,010.2	2,379.8		
Feb-11	2,009.7		905.6	1,907.5		
Mar-11	2,201.7		904.4	2,070.0		
Apr-11	1,575.1		511.2	1,570.2		
May-11	1,541.1		296.4	1,567.8		
Jun-11	1,147.9		161.0	1,147.6		
Jul-11	1,124.8		127.8	1,109.1		
Aug-11	1,146.8		218.3	1,085.0		
Sep-11	1,304.9		328.6	1,292.0		
Nov-11	1,148.6		513.4	1,180.2		
Nov-11	1,537.4		936.1	1,386.9		
Dec-11	2,022.4	19,080.1	774.4	2,255.6	18,951.7	
Jan-12	2,434.0		1,118.1	2,367.2		
Feb-12	1,880.2		691.7	2,029.9		
Mar-12	3,109.9		756.2	3,152.8		
Apr-12	696.2		450.6	762.6		
May-12	1,641.4		350.8	1,604.1		
Jun-12	1,699.5		195.1	1,658.9		
Jul-12	1,276.5		140.1	1,246.4		
Aug-12	1,153.4		157.9	1,162.8		
Sep-12	1,053.0		271.0	1,107.9		
Oct-12	1,369.6		639.3	1,252.9		
Nov-12	2,358.9		969.6	2,168.9		
Dec-12	1,837.8	20,510.4	1,196.8	1,573.6	20,087.8	

ATCO Electric Yukon
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Stewart Crossing

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast UPC (kWh)	(Whitehorse) MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-13	2,107.2		952.0	2,236.0		
Feb-13	2,070.4		665.4	2,251.1		
Mar-13	2,883.5		851.1	2,814.6		
Apr-13	1,928.8		639.9	1,772.3		
May-13	1,760.9		294.0	1,790.4		
Jun-13	1,495.6		112.4	1,552.4		
Jul-13	1,264.5		92.5	1,290.3		
Aug-13	1,622.2		98.9	1,701.0		
Sep-13	1,199.5		264.3	1,262.3		
Oct-13	1,587.8		501.4	1,633.5		
Nov-13	1,494.1		865.6	1,426.6		
Dec-13	1,641.0	21,055.6	1,144.7	1,438.1	21,168.7	
Jan-14	3,117.1		745.8	3,488.7		
Feb-14	1,937.6		992.4	1,733.3		
Mar-14	1,861.8		855.1	1,788.2		
Apr-14	1,584.3		499.8	1,592.8		
May-14	1,522.7		269.5	1,581.1		
Jun-14	1,097.5		200.5	1,050.6		
Jul-14	1,367.0		98.0	1,386.4		
Aug-14	793.7		144.0	819.5		
Sep-14	1,102.4		307.1	1,114.8		
Oct-14	1,629.8		515.6	1,658.7		
Nov-14	1,808.2		772.8	1,849.9		
Dec-14	2,139.9	19,962.1	854.4	2,278.8	20,342.8	
Jan-15	2,014.6		927.0	2,172.8		
Feb-15	2,493.4		851.4	2,455.1		
Mar-15	2,049.6		671.3	2,192.5		
Apr-15	1,641.2		453.5	1,704.2		
May-15	1,651.8		192.9	1,800.4		
Jun-15	856.1		127.2	895.5		
Jul-15	1,343.0		115.7	1,341.6		
Aug-15	849.3		183.2	828.9		
Sep-15	1,262.1		332.7	1,244.4		
Oct-15	1,339.1		469.8	1,422.0		
Nov-15	1,530.9		759.2	1,588.7		
Dec-15	1,728.2	18,759.4	947.9	1,757.1	19,402.9	
Jan-16	2,523.0		827.6	2,798.2		
Feb-16	1,741.6		688.0	1,895.7		
Mar-16	1,551.3		611.6	1,764.4		
Apr-16	1,549.1					
May-16	1,559.2					
Jun-16	808.0					
Jul-16	1,267.7					
Aug-16	801.6					
Sep-16	1,191.3					
Oct-16	1,263.9					
Nov-16	1,445.0					
Dec-16	1,631.2	17,333.1			17,975.5	
Jan-17	2,381.5					
Feb-17	1,643.9					
Mar-17	1,464.2					
Apr-17	1,462.2					
May-17	1,471.7					
Jun-17	762.7					
Jul-17	1,196.5					
Aug-17	756.7					
Sep-17	1,124.5					
Oct-17	1,193.0					
Nov-17	1,364.0					
Dec-17	1,539.7	16,360.7			16,360.7	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (18,759.4 / 21,055.6) ^ (1/2) - 1 = **-5.6%**

Note: January, February and March 2016 have been updated to include actuals.

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Swift River

Commercial Monthly	Annual		MHDD	Annual		Regression Output:																																																		
	UPC (kWh)	Actual / Forecast (Watson Lake)		UPC (kWh)	UPC (kWh)																																																			
Jan-95	1,759.9		938.7	1,992.8	SUMMARY OUTPUT Regression Statistics Multiple R0.826519304 R Square0.68313416 Adjusted R Square0.681354014 Standard Error208.3617453 Observations180 ANOVA <table><thead><tr><th></th><th>df</th><th>SS</th><th>MS</th><th>F</th><th>Significance F</th></tr></thead><tbody><tr><td>Regression</td><td>1</td><td>16660443.39</td><td>16660443.39</td><td>383.7519382</td><td>2.72689E-46</td></tr><tr><td>Residual</td><td>178</td><td>7727801.812</td><td>43414.61692</td><td></td><td></td></tr><tr><td>Total</td><td>179</td><td>24388245.2</td><td></td><td></td><td></td></tr></tbody></table> <table><thead><tr><th></th><th>Coefficients</th><th>Standard Error</th><th>t Stat</th><th>P-value</th><th>Lower 95%</th><th>Upper 95%</th><th>Lower 95.0%</th><th>Upper 95.0%</th></tr></thead><tbody><tr><td>Intercept</td><td>775.2885192</td><td>28.02524581</td><td>27.66393288</td><td>2.3163E-66</td><td>719.9840347</td><td>830.5930036</td><td>719.9840347</td><td>830.5930036</td></tr><tr><td>WH-HDD</td><td>0.750721472</td><td>0.038322475</td><td>19.58958749</td><td>2.72689E-46</td><td>0.675096632</td><td>0.826346311</td><td>0.675096632</td><td>0.826346311</td></tr></tbody></table>		df	SS	MS	F	Significance F	Regression	1	16660443.39	16660443.39	383.7519382	2.72689E-46	Residual	178	7727801.812	43414.61692			Total	179	24388245.2					Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Intercept	775.2885192	28.02524581	27.66393288	2.3163E-66	719.9840347	830.5930036	719.9840347	830.5930036	WH-HDD	0.750721472	0.038322475	19.58958749	2.72689E-46	0.675096632	0.826346311	0.675096632	0.826346311
	df	SS	MS	F		Significance F																																																		
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	Coefficients	Standard Error	t Stat	P-value		Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%																																															
Intercept	775.2885192	28.02524581	27.66393288	2.3163E-66		719.9840347	830.5930036	719.9840347	830.5930036																																															
WH-HDD	0.750721472	0.038322475	19.58958749	2.72689E-46		0.675096632	0.826346311	0.675096632	0.826346311																																															
Feb-95	1,567.1		941.9	1,595.9																																																				
Mar-95	1,108.1		855.6	1,135.4																																																				
Apr-95	1,114.0		492.7	1,156.9																																																				
May-95	1,277.7		242.5	1,334.0																																																				
Jun-95	1,100.1		97.0	1,132.0																																																				
Jul-95	1,090.4		113.0	1,074.4																																																				
Aug-95	1,403.9		189.9	1,373.7																																																				
Sep-95	1,315.8		224.9	1,377.1																																																				
Oct-95	1,084.6		552.7	1,090.6																																																				
Nov-95	1,266.4		1,000.2	1,234.8																																																				
Dec-95	1,423.6	15,511.6	1,295.4	1,341.7	15,839.3																																																			
Jan-96	1,678.9		1,605.2	1,411.5																																																				
Feb-96	1,638.1		947.3	1,662.9																																																				
Mar-96	1,270.5		874.3	1,283.7																																																				
Apr-96	1,265.5		547.7	1,267.1																																																				
May-96	1,146.7		366.4	1,110.0																																																				
Jun-96	1,084.3		163.9	1,065.9																																																				
Jul-96	1,110.5		103.3	1,101.8																																																				
Aug-96	1,076.1		185.1	1,049.6																																																				
Sep-96	1,377.9		354.7	1,341.8																																																				
Oct-96	1,115.1		662.2	1,038.9																																																				
Nov-96	1,295.6		1,121.2	1,173.2																																																				
Dec-96	1,372.0	15,431.3	1,361.1	1,240.8	14,747.1																																																			
Jan-97	1,745.3		1,406.6	1,627.0																																																				
Feb-97	1,308.7		884.8	1,380.4																																																				
Mar-97	1,290.7		943.9	1,251.6																																																				
Apr-97	948.8		527.9	965.2																																																				
May-97	1,597.4		311.8	1,601.6																																																				
Jun-97	800.1		142.6	797.8																																																				
Jul-97	818.8		84.1	824.5																																																				
Aug-97	741.6		109.6	771.7																																																				
Sep-97	904.3		271.1	931.0																																																				
Oct-97	995.1		659.7	920.7																																																				
Nov-97	1,272.9		935.8	1,289.6																																																				
Dec-97	1,300.5	13,724.2	983.7	1,452.7	13,813.8																																																			
Jan-98	1,941.6		1,409.7	1,821.0																																																				
Feb-98	1,461.2		942.0	1,490.0																																																				
Mar-98	1,278.4		843.4	1,314.7																																																				
Apr-98	1,111.3		500.1	1,148.6																																																				
May-98	1,051.6		211.0	1,131.5																																																				
Jun-98	907.4		89.0	945.2																																																				
Jul-98	627.2		65.7	646.7																																																				
Aug-98	951.6		156.8	946.3																																																				
Sep-98	1,049.1		320.7	1,038.5																																																				
Oct-98	1,043.1		561.2	1,042.6																																																				
Nov-98	1,347.3		958.1	1,347.3																																																				
Dec-98	1,090.1	13,859.8	1,252.7	1,040.3	13,912.8																																																			
Jan-99	1,357.4		1,350.2	1,281.4																																																				
Feb-99	1,779.0		1,066.4	1,714.4																																																				
Mar-99	1,527.6		871.4	1,542.9																																																				
Apr-99	957.1		506.4	989.7																																																				
May-99	1,349.4		372.2	1,308.2																																																				
Jun-99	827.9		140.2	827.4																																																				
Jul-99	972.4		99.4	966.7																																																				
Aug-99	827.5		127.8	844.0																																																				
Sep-99	910.4		292.5	921.0																																																				
Oct-99	1,102.3		519.8	1,132.9																																																				
Nov-99	1,518.0		939.9	1,531.6																																																				
Dec-99	1,325.2	14,454.1	1,013.0	1,455.3	14,515.5																																																			
Jan-00	1,658.0		1,344.8	1,586.1																																																				
Feb-00	1,442.5		956.0	1,460.8																																																				
Mar-00	1,681.0		750.1	1,787.4																																																				
Apr-00	1,130.5		590.9	1,099.7																																																				
May-00	1,269.2		373.8	1,226.9																																																				
Jun-00	810.6		158.0	796.7																																																				
Jul-00	846.6		84.3	852.2																																																				
Aug-00	987.1		216.9	936.7																																																				
Sep-00	995.1		314.8	988.9																																																				
Oct-00	1,203.9		575.8	1,192.5																																																				
Nov-00	1,421.3		858.4	1,496.1																																																				
Dec-00	1,543.2	14,989.1	1,222.8	1,515.8	14,939.8																																																			

ATCO Electric Yukon
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Swift River

Commercial Monthly	Annual			Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)	MHDD	Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-01	1,817.8		1,043.4	1,972.2		
Feb-01	1,479.2		1,031.0	1,441.2		
Mar-01	1,598.2		844.9	1,633.4		
Apr-01	1,492.8		535.8	1,503.3		
May-01	1,354.6		366.6	1,317.7		
Jun-01	1,032.5		155.5	1,020.5		
Jul-01	1,001.3		120.3	979.8		
Aug-01	973.1		120.6	995.0		
Sep-01	961.3		299.6	966.6		
Oct-01	1,308.6		577.0	1,296.3		
Nov-01	1,681.7		975.0	1,669.0		
Dec-01	1,742.7	16,443.9	1,275.4	1,675.8	16,470.8	
Jan-02	2,013.2		1,246.3	2,015.2		
Feb-02	1,652.4		970.3	1,659.9		
Mar-02	1,808.9		991.6	1,734.0		
Apr-02	1,573.2		694.8	1,464.4		
May-02	1,686.6		365.9	1,650.3		
Jun-02	977.4		147.8	971.2		
Jul-02	1,067.9		121.6	1,045.4		
Aug-02	993.9		181.5	970.0		
Sep-02	1,020.0		331.0	1,001.7		
Oct-02	1,174.2		514.8	1,208.6		
Nov-02	1,532.7		821.9	1,634.9		
Dec-02	1,669.9	17,170.3	1,117.9	1,721.3	17,076.9	
Jan-03	2,179.8		1,177.5	2,233.4		
Feb-03	1,849.7		964.7	1,861.4		
Mar-03	1,877.3		899.5	1,871.6		
Apr-03	1,735.3		554.4	1,731.9		
May-03	1,204.5		341.6	1,186.4		
Jun-03	1,022.1		179.9	991.7		
Jul-03	810.2		56.6	836.6		
Aug-03	1,106.6		163.0	1,096.7		
Sep-03	1,093.1		330.2	1,075.4		
Oct-03	1,070.9		526.1	1,096.8		
Nov-03	1,580.1		963.9	1,575.8		
Dec-03	1,741.6	17,271.3	1,095.5	1,809.8	17,367.4	
Jan-04	1,941.7		1,365.6	1,854.2		
Feb-04	1,569.6		881.2	1,644.0		
Mar-04	1,773.5		809.9	1,835.0		
Apr-04	1,404.6		497.4	1,443.9		
May-04	875.6		292.3	894.5		
Jun-04	877.9		74.1	926.9		
Jul-04	888.1		35.6	930.2		
Aug-04	913.1		145.7	916.1		
Sep-04	978.6		370.7	930.5		
Oct-04	1,226.3		565.0	1,223.0		
Nov-04	1,584.1		875.5	1,646.1		
Dec-04	1,889.2	15,922.2	1,070.7	1,976.0	16,220.4	
Jan-05	1,989.2		1,330.3	1,928.2		
Feb-05	1,540.4		941.8	1,569.3		
Mar-05	1,426.2		726.9	1,550.1		
Apr-05	1,518.1		464.8	1,582.0		
May-05	1,002.7		256.9	1,048.2		
Jun-05	842.8		126.6	852.4		
Jul-05	831.5		136.9	797.6		
Aug-05	880.2		162.2	870.9		
Sep-05	884.0		297.3	891.0		
Oct-05	1,193.3		541.7	1,207.5		
Nov-05	1,479.5		758.4	1,629.4		
Dec-05	1,636.0	15,224.0	1,061.0	1,730.1	15,656.5	
Jan-06	1,705.3		1,185.2	1,753.2		
Feb-06	1,764.8		1,016.7	1,737.5		
Mar-06	1,743.6		960.5	1,692.1		
Apr-06	1,283.6		528.2	1,299.8		
May-06	1,131.4		371.1	1,091.1		
Jun-06	873.5		136.5	875.7		
Jul-06	926.0		79.2	935.4		
Aug-06	901.7		171.7	885.3		
Sep-06	862.5		292.4	873.2		
Oct-06	1,021.0		543.3	1,034.0		
Nov-06	1,371.9		1,196.2	1,193.2		
Dec-06	1,710.9	15,296.3	1,050.0	1,813.3	15,183.7	

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Swift River

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)		Normalized UPC (kWh)	Normalized UPC (kWh)	
Jan-07	1,874.5		1,102.4	1,984.5		
Feb-07	1,668.3		1,017.3	1,640.5		
Mar-07	1,446.2		1,001.9	1,363.5		
Apr-07	1,516.9		543.0	1,522.0		
May-07	1,312.4		332.2	1,301.3		
Jun-07	806.2		122.6	818.8		
Jul-07	1,052.7		88.6	1,055.0		
Aug-07	1,051.7		143.1	1,056.7		
Sep-07	696.2		314.7	690.1		
Oct-07	1,318.2		553.1	1,323.9		
Nov-07	1,624.7		956.6	1,625.8		
Dec-07	1,651.2	16,019.0	1,255.1	1,599.5	15,981.7	
Jan-08	2,023.8		1,300.1	1,985.5		
Feb-08	1,688.1		1,064.2	1,625.1		
Mar-08	1,445.8		833.3	1,489.8		
Apr-08	1,543.3		554.0	1,540.2		
May-08	1,216.3		295.6	1,232.7		
Jun-08	980.5		191.0	941.8		
Jul-08	992.2		131.5	962.4		
Aug-08	1,056.9		154.0	1,053.8		
Sep-08	960.2		304.2	962.0		
Oct-08	1,012.5		523.5	1,040.4		
Nov-08	1,627.8		879.0	1,687.2		
Dec-08	1,609.5	16,157.2	1,386.5	1,459.3	15,980.0	
Jan-09	1,956.6		1,307.2	1,912.9		
Feb-09	1,659.5		1,055.5	1,603.0		
Mar-09	1,863.2		1,010.7	1,773.9		
Apr-09	1,341.6		556.5	1,336.6		
May-09	1,088.4		356.0	1,059.4		
Jun-09	892.6		131.2	898.8		
Jul-09	1,038.3		92.0	1,038.0		
Aug-09	959.6		146.9	961.8		
Sep-09	941.9		284.4	958.6		
Oct-09	862.6		610.0	825.5		
Nov-09	1,398.8		977.8	1,384.0		
Dec-09	1,282.8	15,285.8	1,331.1	1,174.1	14,926.7	
Jan-10	1,695.2		1,219.7	1,717.2		
Feb-10	1,334.8		933.5	1,369.9		
Mar-10	1,128.6		719.7	1,257.8		
Apr-10	995.1		466.3	1,057.8		
May-10	984.9		263.4	1,025.4		
Jun-10	395.6		147.1	389.9		
Jul-10	428.3		65.0	448.4		
Aug-10	593.1		118.1	616.9		
Sep-10	858.8		316.8	851.2		
Oct-10	821.5		501.8	865.6		
Nov-10	1,399.9		890.7	1,450.5		
Dec-10	1,321.0	11,956.7	1,270.4	1,257.9	12,308.4	
Jan-11	1,629.3		1,177.7	1,682.8		
Feb-11	1,259.1		977.4	1,261.3		
Mar-11	1,494.9		995.9	1,416.8		
Apr-11	1,140.3		552.5	1,138.3		
May-11	773.9		269.8	809.7		
Jun-11	668.0		142.1	666.0		
Jul-11	624.0		103.2	615.4		
Aug-11	770.0		192.1	738.2		
Sep-11	699.3		292.4	710.0		
Nov-11	1,025.1		511.9	1,061.7		
Nov-11	1,185.5		1,059.1	1,109.7		
Dec-11	1,247.8	12,517.3	1,006.3	1,382.9	12,592.8	
Jan-12	1,677.6		1,273.0	1,659.6		
Feb-12	1,260.1		935.5	1,293.8		
Mar-12	1,216.1		909.0	1,203.3		
Apr-12	1,170.1		512.6	1,198.1		
May-12	915.2		340.2	898.1		
Jun-12	912.9		149.7	905.2		
Jul-12	740.6		77.8	751.0		
Aug-12	925.5		134.0	937.3		
Sep-12	719.0		278.8	739.9		
Oct-12	1,058.4		714.5	942.9		
Nov-12	1,237.0		1,112.8	1,120.8		
Dec-12	1,316.9	13,149.6	1,356.2	1,189.4	12,839.5	

ATCO Electric Yukon
2016 - 2017 General Rate Application

Section 2
Attachment 37

Swift River

Commercial Monthly	Annual		MHDD	Annual		Regression Output:
	UPC (kWh)	Actual / Forecast (Watson Lake) UPC (kWh)		UPC (kWh)	UPC (kWh)	
Jan-13	1,442.2		1,129.1	1,532.2		
Feb-13	1,138.9		765.8	1,300.0		
Mar-13	1,204.2		950.7	1,160.1		
Apr-13	1,109.5		690.1	1,004.2		
May-13	876.7		304.5	886.4		
Jun-13	797.9		96.3	830.3		
Jul-13	764.5		105.1	754.5		
Aug-13	780.0		82.2	830.7		
Sep-13	849.5		239.1	900.1		
Oct-13	966.5		490.2	1,019.3		
Nov-13	1,222.6		1,021.3	1,175.2		
Dec-13	1,574.9	12,727.4	1,248.8	1,528.0	12,920.9	
Jan-14	1,506.7		937.7	1,740.4		
Feb-14	1,359.1		1,204.4	1,190.8		
Mar-14	1,275.6		1,008.9	1,187.7		
Apr-14	1,276.7		570.5	1,261.2		
May-14	872.5		331.1	862.3		
Jun-14	905.1		186.8	869.5		
Jul-14	820.9		87.6	824.0		
Aug-14	1,020.9		144.8	1,024.7		
Sep-14	829.6		295.8	837.7		
Oct-14	1,041.8		539.7	1,057.5		
Nov-14	1,312.1		936.4	1,328.3		
Dec-14	1,437.6	13,658.7	1,176.7	1,444.8	13,629.1	
Jan-15	1,555.4		1,022.8	1,725.2		
Feb-15	1,542.7		956.7	1,560.4		
Mar-15	1,159.8		766.3	1,254.0		
Apr-15	1,159.4		497.4	1,198.7		
May-15	1,036.8		210.8	1,116.8		
Jun-15	706.8		111.8	727.6		
Jul-15	694.1		92.4	693.6		
Aug-15	653.8		147.5	655.5		
Sep-15	846.5		336.1	824.4		
Oct-15	900.5		523.7	928.2		
Nov-15	1,340.5		887.8	1,393.3		
Dec-15	1,415.5	13,011.8	1,160.3	1,435.1	13,512.8	
Jan-16	1,696.5		1,099.3	1,808.9		
Feb-16	1,385.5		930.8	1,422.6		
Mar-16	1,161.2		724.3	1,287.0		
Apr-16	1,172.3					
May-16	1,048.3					
Jun-16	714.7					
Jul-16	701.8					
Aug-16	661.0					
Sep-16	855.9					
Oct-16	910.5					
Nov-16	1,355.4					
Dec-16	1,431.3	13,094.4			13,369.7	
Jan-17	1,715.4					
Feb-17	1,400.9					
Mar-17	1,174.1					
Apr-17	1,185.3					
May-17	1,059.9					
Jun-17	722.6					
Jul-17	709.6					
Aug-17	668.4					
Sep-17	865.5					
Oct-17	920.6					
Nov-17	1,370.5					
Dec-17	1,447.2	13,239.9			13,239.9	

2 year Compound Annual Growth Rate =
= (2015 Actual UPC / 2013 Actual UPC) ^ (1/(2015 - 2013)) - 1 =
= (13,011.8 / 12,727.4) ^ (1/2) - 1 = **1.1%**

Note: January, February and March 2016 have been updated to include actuals.

Whitehorse

Heating Degree Day (HDD)

Degree Days Below 18.0 °C

MONTH	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	"Normal" HDD (1995-2015)
JAN	1020.1	1530.1	1185.7	1165.7	1183.1	1082.9	724.6	938.1	992.6	1254	1165.8	1096.2	912	1113.8	1137.9	991.1	1010.2	1118.1	952.0	745.8	927.0	1,061.3
FEB	840.1	835.8	656.5	719.1	976.4	735.2	864.1	824.6	756.6	697.2	795.2	821.3	998.8	954.6	955.4	679.2	905.6	691.7	665.4	992.4	851.4	818.8
MAR	880	805.8	855.4	756.6	734	659.2	765.3	921	832.2	753.5	613.7	906.3	954.2	734.7	868.5	656	901.7	756.2	851.1	855.1	671.3	792.6
APR	439.9	526	484	458.6	508.8	515.6	505.3	653.3	514.3	466.6	453.3	519.1	486.4	517.3	515.2	461.2	511.2	450.6	639.9	499.8	453.5	507.0
MAY	250.7	357.3	331.1	270.6	391.9	382	390.4	361.6	363.7	272.5	256.6	346.9	322.1	307.9	331.2	292	296.4	350.8	294.0	269.5	192.9	319.1
JUN	139	193.6	148.9	119.5	153.9	172.5	167.3	175.6	192.8	83.7	154.4	173.1	140.5	225.6	144.1	171.9	161	195.1	112.4	200.5	127.2	160.7
JUL	96.6	124.9	92.8	111.6	108.6	142.1	139.6	130.9	84.2	74.2	132.6	118.4	102.3	173.4	62.5	117.3	127.8	140.1	92.5	98.0	115.7	114.5
AUG	198.3	227.3	130	189.2	145.7	219.7	139.6	182.8	180.6	101.7	150.8	201.6	154.2	187.7	158.3	146.2	217.9	157.9	98.9	144.0	183.2	165.9
SEP	226.5	362.6	282.1	327.8	311.2	354.2	309	314.4	359.2	367.5	299.3	295.7	308.4	318.7	306.1	332.4	328.5	271	264.3	307.1	332.7	317.6
OCT	524.9	679.9	641	557.7	499.8	537.2	573.4	444.3	466.7	540.5	534.6	520.5	543.7	563	541.8	520.4	513.3	639.3	501.4	515.6	469.8	540.2
NOV	894.4	975	685.8	792.3	792.5	694.2	818	582.6	874.6	719.8	762.6	1162.2	724.6	782.5	781.5	717.6	931.7	969.6	865.6	772.8	759.2	808.2
DEC	1048.6	1155.8	762	1051.8	844	973	1094.6	845.1	911.6	899.5	794.4	824.3	1069.5	1196.2	955.2	1162.5	775.1	1196.8	1,144.7	854.4	947.9	972.4
TOTAL	6559.1	7774.1	6255.3	6520.5	6649.9	6467.8	6491.2	6374.3	6529.1	6230.7	6113.3	6985.6	6716.7	7065.4	6757.7	6247.8	6680.4	6937.2	6,482.2	6,255.0	6,031.8	6,578.3

Watson Lake

Heating Degree Day (HDD)

Degree Days Below 18.0 °C

MONTH	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	"Normal" HDD (1995-2015)
JAN	938.7	1605.2	1406.6	1409.7	1350.2	1344.8	1043.4	1246.3	1177.5	1365.6	1330.3	1185.2	1102.4	1300.1	1329.3	1219.7	1201	1273	1,129.1	937.7	1,022.8	1,249.0
FEB	941.9	947.3	884.8	942	1066.4	956	1031	970.3	964.7	881.2	941.8	1016.7	1017.3	1064.2	1089.5	965.8	1004.6	935.5	765.8	1,204.4	956.7	980.3
MAR	855.6	874.3	943.9	843.4	871.4	750.1	844.9	991.6	899.5	809.9	726.9	960.5	1001.9	833.3	1054.2	763.5	1032.9	909	950.7	1,008.9	766.3	891.9
APR	492.7	547.7	527.9	500.1	506.4	590.9	535.8	694.8	554.4	497.4	464.8	528.2	543	554	590	502.7	587.5	512.6	690.1	570.5	497.4	549.8
MAY	242.5	366.4	311.8	211	372.2	373.8	366.6	365.9	341.6	292.3	256.9	371.1	332.2	295.6	356	277.7	271.1	340.2	304.5	331.1	210.8	317.4
JUN	97	163.9	142.6	89	140.2	158	155.5	147.8	179.9	74.1	126.6	136.5	122.6	191	131.2	142.7	143.1	149.7	96.3	186.8	111.8	139.5
JUL	113	103.3	84.1	65.7	99.4	84.3	120.3	121.6	56.6	35.6	136.9	79.2	88.6	131.5	89	70.8	104.4	77.8	105.1	87.6	92.4	91.7
AUG	189.9	185.1	109.6	156.8	127.8	216.9	120.6	181.5	163	145.7	162.2	171.7	143.1	154	134.4	119.6	195.1	134	82.2	144.8	147.5	149.8
SEP	224.9	354.7	271.1	320.7	292.5	314.8	299.6	331	330.2	370.7	297.3	292.4	314.7	304.2	279.4	316.8	292.4	278.8	239.1	295.8	336.1	306.6
OCT	552.7	662.2	659.7	561.2	519.8	575.8	577	514.8	526.1	565	541.7	543.3	553.1	523.5	606.9	501.8	511.9	714.5	490.2	539.7	523.7	560.6
NOV	1000.2	1121.2	935.8	958.1	939.9	858.4	975	821.9	963.9	875.5	758.4	1196.2	956.6	882.5	996.5	904.2	1059.1	1112.8	1,021.3	936.4	887.8	958.1
DEC	1295.4	1361.1	983.7	1252.7	1013	1222.8	1275.4	1117.9	1095.5	1070.7	1061	1050	1255.1	1386.5	1340.7	1292.1	1006.3	1356.2	1,248.8	1,176.7	1,160.3	1,186.3
TOTAL	6944.5	8292.4	7261.6	7310.4	7299.2	7446.6	7345.1	7505.4	7252.9	6983.7	6804.8	7531	7430.6	7620.4	7997.1	7077.4	7409.4	7794.1	7,123.2	7,420.4	6,713.6	7,381.0

CW-YECL-26

Reference: N/A

Issue/sub-issue: Energy Efficiency

Preamble: CW is interested in understanding what programs YECL is engaged in, or interested in pursuing to minimize the use of diesel fuel.

Request:

- (a) Please fully explain any and all programs or plans to implement green generation or make micro generation available, such as wind turbines or photo electric panels, and where the costs are included in the application. If no costs are included, please fully explain YECL's position on such programs.
- (b) CW understands that YECL is involved in Photo Voltaic (PV) installations and is aware of PV installations in Old Crow and in the Kluane First Nation. Please fully explain the PV program in each of the communities, including the YECL involvement. Please provide an analysis that clearly demonstrates the cost of PV generation on a kWh basis to the cost of diesel generation. In the response, please provide all supporting working papers and assumptions.
- (c) Please fully explain the role of PV generation as a tool to reduce carbon emissions, reduce O&M costs, and possibly reduce noise levels.
- (d) Please provide YECL's views on the potential for and viability of expanded PV use in the Yukon and the role YECL should play in this endeavour.

Response:

- (a) There are a couple of Yukon Government programs/policies in addition to AEY's own Renewable Study that are intended to allow for additional renewable energy projects including:
 - a. Micro-generation program as described at: <http://www.energy.gov.yk.ca/microgeneration.html> The cost associated with purchasing the power generated under this program surplus to the customer's own needs are paid for by Yukon Government. The costs incurred by AEY to deal with customers entering into this program are not tracked separately and are part of our overall O&M costs.

- b. Yukon Independent Power Producer Policy as described at: <http://www.energy.gov.yk.ca/pdf/independent-power-production-policy-201510.pdf> AEY is working with Yukon Energy, Yukon Development Corporation and Yukon Government to develop the process, rules and Agreements necessary to enable this policy targeted for October 2016. It is not currently clear who will pay for these development costs, any purchase power costs or any ongoing costs associated with this policy. No specific costs for this program are included in this GRA. The application does include a deferral account to flow-through costs related to Board Orders or legislative provisions resulting in changes to the rules or parameters that ATCO Electric Yukon operates under, or that bear on the nature and extent of ATCO Electric Yukon's obligations as a regulated utility and which impact its 2016-2017 revenues or revenue requirement.
- c. Renewable and Alternative Energy Study. AEY is proposing to conduct studies to determine the viability of the displacement of diesel generation within AEY's service area with renewable generation sources or better utilization of the diesel consumed through the use of waste heat for district heating schemes or increased generation as described in Section 12 of the Application. The estimated cost of the studies is \$500,000.
- (b) AEY is in no position to "fully" explain the Photo Voltaic installations in Old Crow and in the Burwash Landing Area as AEY is not the proponent on either potential project. AEY understands that an IPP proponent is interested in developing a solar/battery storage IPP in Old Crow. A proponent is pursuing a wind generation project in the Burwash Landing area.

It is assumed that both of these projects are intending on moving forward under the Unsolicited Proposal component of Yukon IPP Policy even though this Policy is not fully defined and implemented. AEY's major involvement in either of these potential projects will be that of the counter party to an offtake agreement and the integrator within the existing grid.

AEY is not aware of the cost per kWh from either of these projects but the Yukon IPP Policy does state that:

"2. The utilities will work with Yukon government to structure the program, such that it will not lead to higher costs for the consumer."

- (c) The role of PV generation as a tool to reduce carbon emissions, reduce O&M costs and possibly reduce noise levels is predicated that PV generation displaces electricity that was otherwise generated through burning fossil fuels. If it does, then the displaced fuel that is not combusted would not emit carbon, the

fuel cost would not be consumed and the electricity generated with PV would be less noisy than the diesel generator.

- (d) Please refer to response (a) above. AEY will meet the relevant requirements of Yukon government policies and programs as well as move toward the implementation of its own solar generation projects if viable.

CW-YECL-27

Reference: YECL Application, page 9-3

Issue/sub-issue: LED Street Lights

Preamble: On page 9-3, YECL provides a discussion of its program to convert existing street lights to LED lights. CW requires information to assess the YECL Application.

Request:

- (a) YECL indicates that it has two options, one with a customer contribution and one without. Please provide an analysis for each that:
 - a. Includes the incremental capital cost of LED lights.
 - b. Includes any change in asset lives, and depreciation.
 - c. Includes the change in energy use and cost
 - d. Includes changes in maintenance costs
 - e. Includes any other changes in costs or energy.
- (b) Please fully explain any communication between YECL and any customer group, including the City of Whitehorse related to LED lights.
- (c) Please fully explain YECL's preference for street lights.
- (d) Please fully explain what rate is used to charge for LED lights. Please provide the detailed calculation of the Street Light component of Schedule 2.1, including number of lights, and rate, and any differences in rates between the rate used for standard street lights, and for LED street lights.
- (e) If YECL uses a separate LED rate for LED street lights, please provide the reference to where the YUB approved a separate street light rate for LED lights.
- (f) Please provide the calculation of the rate used for conventional street lights and LED street lights.
- (g) Please confirm that all new street lights installed will be LED street lights. If not confirmed, please fully explain.
- (h) Please fully explain the YECL plan, if any, for replacement of existing street lights. Will YECL replace existing street lights with LED lights as the existing

lights fail, or will YECL do a wholesale replacement of existing street lights. Please provide the rationale for the YECL position.

Response:

(a) Please refer to the following table:

	Customer Contribution	No Customer Contribution
a. Cost of Conversion ^{1,2}	Cost estimated at \$503 per light. Customer Contribution \$503 per light plus remaining n. No incremental revenue requirement.	Cost estimated at \$503 per light. Customer Contribution \$0. Incremental revenue requirement estimated at \$62 in year 1 based on weighted average cost of capital and 25 year depreciation.
b. Depreciation and asset lives	No changes proposed to depreciation shown in Schd 7.3, however LED head estimated to last 25 years compared to HPS bulb lifecycle of 5 years. The estimated Net Book Value based on average asset class of the existing HPS head is estimated at \$66.	
c. Energy Savings ¹	LEDs are expected to save 260kWh per year.	
c. Purchase Power Savings ¹	- For the Hydro system, LEDs are expected to save \$23 in purchase power cost per year. - For the Thermal communities, LEDs are expected to save \$69 in fuel cost³ per year.	
d. Maintenance Costs	O&M savings during the test period are estimated at 75%.	

¹ – Costs and savings based on weighted average conversion of existing 100W and 150W HPS streetlight population.

² – Installation costs not applicable for decorative LEDs.

³ – Based on weighted average fuel price of non-standby power from Schedule 4.2, \$0.25/kWh.

(b) Please refer to Response YUB-AEY-10(a).

(c) AEY's preference for street lights is to provide the customer with an optimal end product that fits the needs of our customer and meets the standard for the installation at a reasonable cost. LED technology for street lights continues to evolve to produce a light spectrum and lighting pattern that is comparable to High Pressure Sodium (HPS) lighting technology. Early generation LED lighting had a low wattage that provided less energy consumption, however the quality of the lighting was not adequate. Ideally, AEY will have a light that provides

appropriate lighting for the intended application, requires minimum maintenance and utilizes the least amount of energy.

(d,e,f) Please refer to CW-YECL-27(d) Attachment 1.

- (g) Not confirmed. AEY has recently sourced LED lights that can replace non-decorative, 100W and 150W HPS lights. There is also a LED replacement for sentinel lights. As these lights are equivalent replacements, AEY is using these LED lights now. For new installations, the lights must still meet the requirements of the applicable standard.

The 250W HPS-equivalent LED streetlight available to AEY needs to be evaluated for adequacy in highway applications. AEY is currently working with Yukon Government to provide an acceptable LED lighting option for highway use as LED lights must meet required lighting specifications and be approved for use by the designated Road Authority. The available 250W HPS-equivalent LED light is not acceptable to the customer at this time. AEY is also currently evaluating options for an LED replacement for decorative lights. We have identified five options to City of Whitehorse which have been narrowed down to two preferred options and plan to select the final product by the end of 2016.

- (h) AEY can replace non-decorative 100W and 150W HPS lights with LED streetlights. As HPS lights fail in operation, they will be replaced with an LED light.

AEY is not applying for a wholesale replacement of existing HPS lights. As indicated on page 9-3 of the Application, AEY is seeking Board direction as to the appropriate method of accounting for all costs associated with customers requesting conversions of existing streetlights to LED.

LIGHTING 2016 and 2017 RATES, BILLING DETERMINANTS & REVENUE ON EXISTING RATES

	Watts	Mthly Customer Charge	Mthly Demand Charge per Watt	# Cust Billed in 2016	# Cust Billed in 2017	Street Light Revenue 2016	Street Light Revenue 2017
Street Lights Rates							
6420 - LED	51	\$ 7.83	\$0.0496	180	540	\$1,865	\$5,594
6120 - Mercury Vapor	250	\$ 7.83	\$0.0496	160	106	\$3,237	\$2,144
6130 - Mercury Vapor	400	\$ 7.83	\$0.0496	0	0	\$0	\$0
6140 - High Pressure Sodium	100	\$ 7.83	\$0.0496	38,824	38,719	\$496,559	\$495,210
6180 - High Pressure Sodium	250	\$ 7.83	\$0.0496	16,138	16,605	\$326,472	\$335,919
6190 - High Pressure Sodium	400	\$ 7.83	\$0.0496	252	252	\$6,973	\$6,973
6360 - High Pressure Sodium	150	\$ 7.83	\$0.0496	6,092	6,591	\$93,025	\$100,637
6580 - High Pressure Sodium-High Mast	250	\$ 9.10	\$0.0496	1,156	1,102	\$24,854	\$23,693
6590 - High Pressure Sodium-High Mast	400	\$ 9.10	\$0.0496	636	636	\$18,406	\$18,406
6640 - High Pressure Sodium	70	\$ 7.83	\$0.0496	1,312	1,398	\$14,826	\$15,797
6720 - Mercury Vapor Energy Only	250	\$ 19.05	\$0.0000	384	384	\$7,315	\$7,315
6780 - High Pressure Sodium Energy Only	250	\$ 19.05	\$0.0000	180	180	\$3,429	\$3,429
6790 - High Pressure Sodium Energy Only	400	\$ 29.13	\$0.0000	180	180	\$5,243	\$5,243
Total						\$1,002,203	\$1,020,361