

2019/20
**Annual
Business Plan**

Approved by the Halifax Water Board
January 31, 2019

Approved by Halifax Regional Council
February 26, 2019

**STRAIGHT from
the SOURCE**



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Glossary

AMI	Advanced Meter Infrastructure
AM	Asset Management
AMP	Asset Management Plan
DOE	Department of Energy
E&IS	Engineering & Information Services
EMAP	Energy Management Action Plan
EMS	Environmental Management System
ERM	Enterprise Risk Management
GIS	Geographic Information System
H2O	Help to Others [Program]
HW	Halifax Water
I&I	Inflow and Infiltration
IFRS	International Financial Reporting Standards
IRP	Integrated Resource Plan
NOM	Natural Organic Matter
NSE	Nova Scotia Environment
NSERC	Natural Sciences and Engineering Research Council
NSPI	Nova Scotia Power Incorporated
NSUARB	Nova Scotia Utility and Review Board
RDC	Regional Development Charge
RDII	Rain Derived Inflow and Infiltration
SCADA	Supervisory Control and Data Acquisition
SSES	Sanitary Sewer Evaluation Survey
UV	Ultraviolet
WRWIP	West Region Wastewater Infrastructure Plan
WSER	Wastewater System Effluent Regulations
WSP	Water Supply Plant
WWTF	Wastewater Treatment Facility

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1. INTRODUCTION

After completing over a decade of operations as an integrated water, wastewater and stormwater utility, Halifax Water is well positioned to continue its tradition of stewardship. Since 2007, Halifax Water has established a framework for sustainable service delivery with a focus on infrastructure renewal, regulatory compliance, growth and customer service. This strategic framework is paramount to attaining a high level of service for over 95,000 customers and remaining committed to environmental stewardship, as described in its Mission, Vision and Values [See Appendix A]. Halifax Water delivers service through five departments; Water Services; Wastewater and Stormwater Services; Corporate Services, Engineering and Information Services; and Regulatory Services, as detailed within Section 3 and illustrated in Appendix B.

The 2019/20 fiscal year marks the second year of the Five-Year Business Plan approved by the Halifax Water Board in January, 2018. With the wastewater system coming into regulatory compliance and a mature rate structure established for all services, Halifax Water will continue its focus on asset renewal and enhanced customer service over the next year. The utility took advantage of provincial and federal funding for infrastructure investments through the New Building Canada Fund, and Clean Water and Wastewater Fund [CWWF] last year, and expects these programs will continue for implementation of projects in coming years. With Halifax Regional Council endorsement, Halifax Water recently submitted an application for a water transmission main renewal project under the Investing in Canada Infrastructure Program [ICIP].

Asset renewal will continue to be supported by a formal asset management plan and benefit from an expanded research program in partnership with Dalhousie University. The 2019/20 fiscal year will see the inclusion of wastewater in the Natural Sciences and Engineering Research Council [NSERC] Research Chair to build on the last eleven years of research in water treatment and quality. The delivery of services will be complemented by adoption of industry best practices including an innovative approach to wet weather management and lead service line replacements.

The 2018/19 fiscal year also saw continued progress with Customer Connect, a project to install the next generation of meter technology to position Halifax Water as the utility of the future. The Nova Scotia Utility and Review Board [NSUARB] approved a \$25.4 capital expenditure for the implementation of Advanced Metering Infrastructure [AMI] which will see the replacement or upgrade of over 83,000 customer meters and establish a smart network throughout the service area. The project has an anticipated completion in the 2019/20 fiscal year to enhance both customer service and operational efficiency.

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2. EXECUTIVE SUMMARY

The 2019/20 Business Plan reflects the strategic direction envisioned in the Five Year Business Plan [2018/19 to 2022/23] and recognizes the need for further capital investment as contemplated in the Integrated Resource Plan [IRP]. The IRP will be updated this coming fiscal year with recently completed infrastructure master plans indicating the continued need to invest in aging infrastructure. In recognition that investment over the last 11 years in wastewater treatment facilities have realized the goal of environmental compliance, 2019/20 will see more focus on upgrades to the two primary water supply plants [WSPs] at Pockwock Lake and Lake Major. Although many investments have been made at the J.D. Kline WSP at Pockwock to renew filter underdrain, mechanical and electrical systems, 2019/20 will focus on the phenomenon of lake recovery which will necessitate major upgrades to the plant within five years. Electrical and mechanical systems will also be upgraded at Lake Major in recognition that the plant has been operational for twenty years and many of these systems are reaching the end of their useful life. In accordance with sound financial stewardship, final debt payments related to the construction of the Lake Major WSP were made in 2018/19.

Although 2019/20 marks a milestone for wastewater regulatory compliance, efforts will continue to optimize plants for effluent quality and energy savings. The 2019/20 fiscal year will also realize the utility's vision to expand the current NSERC Industrial Research Chair with Dalhousie to include a wastewater stream. The last eleven years have realized tremendous benefit from drinking water research and it is expected a focus on wastewater will deliver similar results. The long term vision is to ensure compliance and a cost effective approach to the objectives stipulated in the federal Wastewater System Effluent Regulations which take effect in 2040.

The Customer Connect project will be entering the third and final year of implementation which will see the upgrade of all customer meters to advanced metering infrastructure [AMI]. This initiative will enhance service delivery by putting water consumption data in the hands of the customer through a Web portal to be developed this year. Detailed information on water consumption will also allow refinement of Halifax Water's approach to water loss control to ensure it remains a world leader. With a similar approach to water loss control, the utility is also transforming its approach to wet weather management to reduce inflow and infiltration within priority sewersheds where it can get the best bang for the buck, i.e. improved level of service and/or increased capacity for growth. The 2019/20 fiscal year will see continued investment in these areas all while ensuring a high level of service for the customers of Halifax Water. Annual surveys conducted by Corporate Research Associates over the last decade acknowledge customer satisfaction which is fundamental to the success of the utility. The annual survey results consistently indicate that over 90% of our customers are satisfied or very satisfied with Halifax Water's products and services.

The 2019/20 Business Plan provides an overview of the services provided by Halifax Water [HW] and an overview of the operating and capital budgets to support the delivery of these

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services. The Business Plan projects an operating deficit of \$14.0 million, as indicated in the pro forma income summary below, and reflects the rates approved by the NSUARB in their 2015 and 2017 Decisions. The current water and wastewater rates became effective on April 1, 2016 and the stormwater rate structure came into effect on July 1, 2017. Although the pro forma income summary indicates a loss for the fiscal year, the utility has accumulated an operating surplus over the last three years to defray this deficit position.

Table 1

Pro Forma Income Summary				
	Actual 2017/18	Approved Budget 2018/19	Proposed Budget 2019/20	Variance
Operating Revenues	\$138,145	\$135,182	\$138,727	\$3,545
Operating Expenditures	\$104,452	\$111,710	\$120,756	(\$9,047)
Operating Profit	\$33,694	\$23,472	\$17,971	(\$5,501)
Non-Operating Revenues	\$4,486	\$1,006	\$1,369	\$364
Non-Operating Expenditures	\$34,376	\$36,564	\$33,374	\$3,189
Net Surplus (Deficit)	\$3,804	(\$12,086)	(\$14,034)	(\$1,948)

Note:
Consolidated numbers reported above include regulated and unregulated activities of the Urban Core, Satellite and Airport/AeroTech Systems.
The net surplus (deficit) reported for the 2019/20 Proposed Budget are reported on the accrual basis. Under the NSUARB Accounting and Reporting Handbook some accrued future employment expense liabilities are excluded for the purposes of rate making.

**Amounts are stated in \$ Thousands*

The 2019/20 Operating Budget is prepared on an accrual basis to provide broader information for decision making and to reflect best practice for budgeting. Accrued amounts for 2019/20 include a liability for future employee benefits [pension] based on the International Financial Reporting Standards [IFRS]. Accrued amounts for the comparative years are calculated under the Canadian Institute of Chartered Accountants [CICA] Handbook Section 3461. The NSUARB Accounting and Reporting Handbook for Water Utilities is currently used in determining the revenue requirements for rate making purposes. If accrued pension expenses were omitted in 2019/20, there would be a projected net loss on a NSUARB Handbook basis of \$8.4 million. There is sufficient accumulated operating surplus to offset the budgeted operating loss in 2019/20.

As outlined in the Table 2 below, operating expenses are budgeted to increase \$9.0 million or 8.1% compared to the 2018/19 Operating Budget. Depreciation expense will increase by

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\$1.6 million or 7.0%. Debt Servicing will decrease by \$3.2 million or 10% when compared to the 2018/19 Operating Budget.

Table 2

Expense Summary				
	Actual 2017/18	Approved Budget 2018/19	Proposed Budget 2019/20	Variance
Operating Revenues	\$138,145	\$135,182 <i>-2.1%</i>	\$138,727 <i>2.6%</i>	\$3,545
Operating Expenditures	\$104,452	\$111,710 <i>6.9%</i>	\$120,756 <i>8.1%</i>	(\$9,047)
Non-Operating Revenues	\$4,486	\$1,006 <i>-77.6%</i>	\$1,369 <i>36.2%</i>	\$364
Non-Operating Expenditures	\$34,376	\$36,564 <i>6.4%</i>	\$33,374 <i>-8.7%</i>	\$3,189
Depreciation	\$21,262	\$23,434 <i>10.2%</i>	\$25,085 <i>7.0%</i>	(\$1,651)
Debt Servicing	\$29,333	\$31,406 <i>7.1%</i>	\$28,206 <i>-10.2%</i>	\$3,200

**Amounts are stated in \$ Thousands*

The utility faces pressures associated with asset renewal and growth as described in the IRP. Halifax Water continues to increase its investment in growth related infrastructure and this year, with funding from the Regional Development Charge, will focus on Inflow and Infiltration reduction in the Halifax area to increase wastewater trunk sewer capacity. 2019 will also see the construction of a new water transmission main on Lucasville Road as a key part of a previously approved New Building Canada federal/provincial infrastructure funding program. Halifax Water has also recently submitted an application through the Investing in Canada Infrastructure Program to leverage funding for upgrades to water transmission mains within Halifax peninsula. The balance of the capital budget provides a comprehensive investment across all asset classes and call for expenditures of over \$77 million as outlined in the graphs below.

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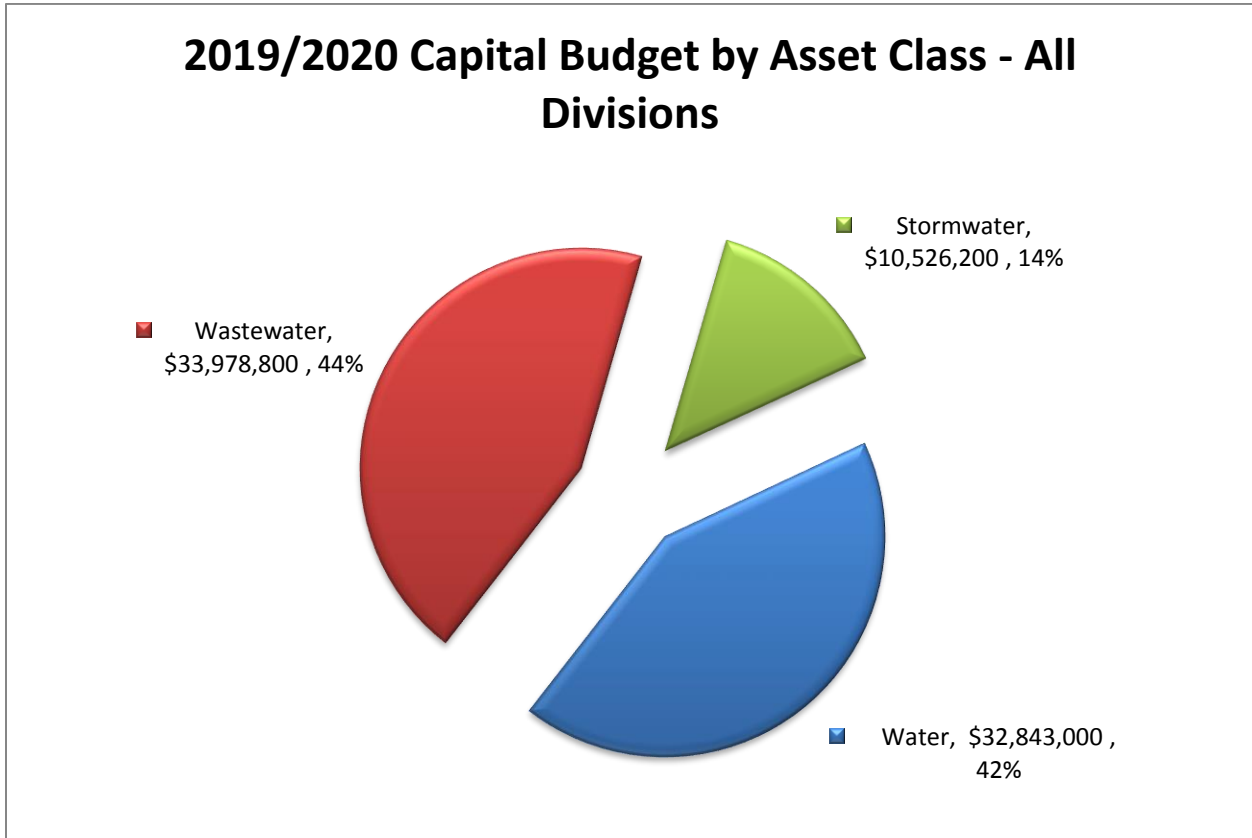


Figure 1 - Capital Budget by Asset Class

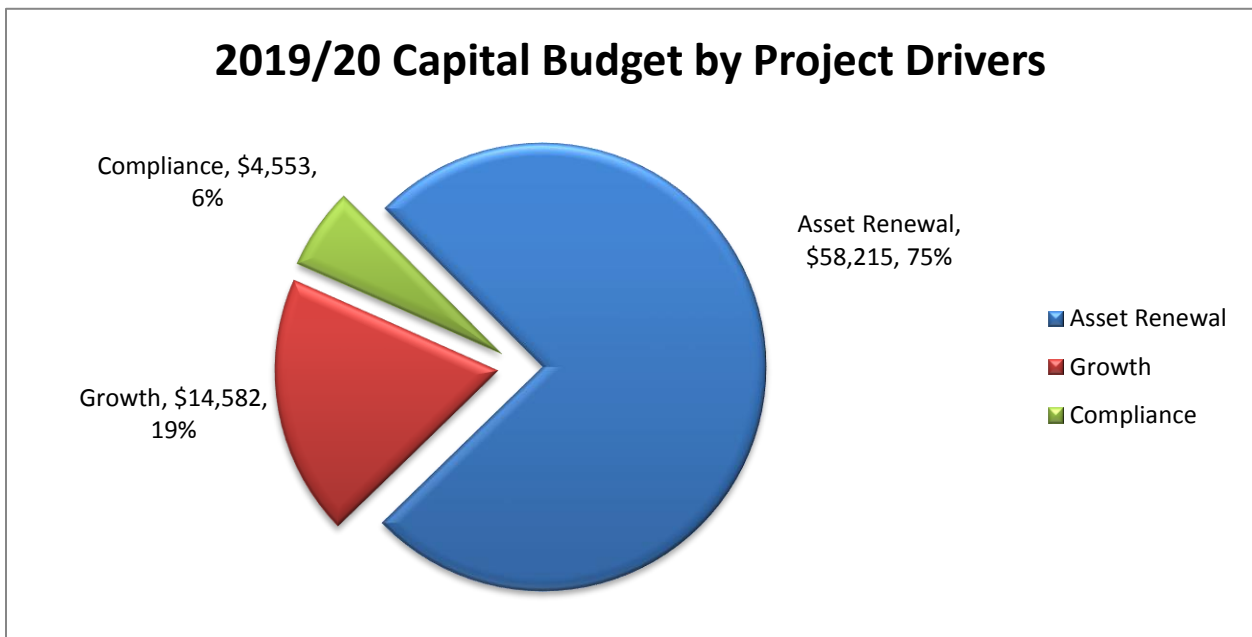


Figure 2 – Capital Budget by Strategic Driver

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Although a general rate increase is not anticipated for 2019/20, Halifax Water may make a water and wastewater rate application in the Fall of 2019 for rates to take effect in Spring 2020. This will depend on the financial results from the 2018/19 fiscal year and whether volumetric revenues remain stable. Fiscal year 2019/20 will however see an application to the NSUARB, for a revised Regional Development Charge to facilitate growth within the municipality. In relation to the approved Cost of Service Manual, and revised stormwater rate structure, 2019/20 will see the continued implementation of a tiered rate structure for residential customers and a credit system for non-residential customers to promote detention of peak stormwater flow. The revised rate structure, as more fully described in this document, does not increase revenues but better aligns costs with those customers who derive the benefits of service, consistent with the Public Utilities Act.

Other major initiatives envisioned for 2019/20 include investments in Information Technology, lead service line and “no corrode” sewer lateral replacements, expansion of the environment management system, the purchase of property in Burnside for a consolidated operations depot and consideration of a district energy system with the proposed Cogswell Interchange redevelopment.

3. SERVICE OVERVIEW

3.1 Water Services

The Water Services Department is responsible for operating and maintaining the municipal water system “from source to tap”. The Water Services Department also provides SCADA [Supervisory Control and Data Acquisition] and process control services for all of Halifax Water. The department is organized to both maintain and operate the water system as a holistic system, with managers assigned accountability for clearly defined aspects of the system. The Water Services Department provides the following services:

- **Source Water Protection:** Managing and protecting watershed land, developing and maintaining source water plans, enforcement of Protected Water Area and other relevant source water regulations, source water community relations including working with and developing watershed advisory boards, real property maintenance of source water lands, and forestry management of watershed lands.
- **Water Quality Management:** Water quality planning, water quality monitoring, process support to treatment plants, customer inquiries and investigations, water quality support to capital projects, policy development, research and management of the Halifax Water – Natural Sciences and Engineering Research Council [NSERC] Industrial research chair at Dalhousie University.

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- **Water Supply Plant Operations:** Operation and maintenance of 3 large water supply plants [Pockwock, Lake Major and Bennery Lake], 6 small systems, 6 dams, 2 emergency water supplies and 22 chlorine monitoring devices and rechlorination stations.
- **Distribution System Operations:** Operation and maintenance of the water distribution and transmission systems. The system is managed according to three geographic regions with responsibility for over 1500 km of transmission and distribution mains, 8,300 fire hydrants, 88,000 service connections, 140 pressure control/flow metering facilities, 22 pumping stations, 23,000 valves and 15 water storage facilities. This also includes responding to third party requests for buried infrastructure locates.
- **Technical Services:** Operation and maintenance of the SCADA system and the process communications network; implementation of the SCADA Master Plan, process control cyber security, instrumentation maintenance, electrical maintenance, maintenance of water pumping stations, and operation and development of the process data warehouse.

Water Services is also working with Corporate Services in the planning and implementation of Customer Connect, our project to convert to Advanced Metering Infrastructure [AMI]. Further, embedded within the department, Water Services is responsible for the following major programs.

- **Water Loss Control:** Halifax Water was the first utility in North America to adopt the International Water Association [IWA] methodology for managing leakage in the distribution system. Efforts save \$650,000 per year in treatment chemical and electricity costs and have reduced water main breaks by 20%, saving \$500,000 in repair costs annually. The program has won several national awards and Halifax Water staff are in demand to share expertise with industry and other utilities.
- **NSERC-Halifax Water Industrial Research Chair in Water Quality and Treatment:** This program, carried out in partnership with Dalhousie University over the last ten years has realized significant operational savings, improved water quality and influenced Halifax Water policy. The Research Chair has produced 120 peer reviewed research papers in world recognized scientific journals over the last eleven years and has allowed Halifax Water to become industry recognized leaders in areas such as lead service line replacement and biofilm control in distribution systems. Several Halifax Water employees were trained as students under the Research Chair. Halifax Water and Dalhousie were awarded a third five-year term for the Research Chair, effective April 1, 2017.
- **Lead Service Line Replacement Program:** In September 2016, the Halifax Water Board approved an initiative which will see all lead service lines replaced by 2050. This program is discussed in more detail in Section 5.8 and is being developed and implemented by the Water Quality division in the Water Services Department.

3.2 Wastewater/Stormwater Services

The Wastewater and Stormwater Services Department is responsible for operating and maintaining municipal systems from “drains back to the source again”. In this regard, the Wastewater and Stormwater Services Department has a mandate to protect the environment while providing essential collection and treatment services to its customers. The department also provides corporate Fleet and Building Services. These essential services are delivered through seven managers who are responsible for both stormwater and wastewater activities in three regions and fourteen treatment facilities. The supervisors and the field crews carry out both wastewater and stormwater related duties.

3.2.1 Wastewater Services

The Wastewater Services department strives to provide uninterrupted delivery of the following services:

- **Wastewater Treatment Facility Operations:** Operation and maintenance of 14 wastewater treatment facilities [WWTFs] and associated infrastructure, regulatory reporting, and implementing and coordinating capital upgrades with other Halifax Water departments. As per the Wastewater System Effluent Regulations; 2 plants are classified as very large, 3 are large, 2 are medium and 9 are small capacity. The department also operates 4 additional small treatment facilities under contract from Halifax Regional Municipality and the province.
- **Biosolids Processing:** Liquid transport, dewatering and processing of sludge, operation and maintenance of various dewatering equipment at WWTFs, administering trucking contracts for dewatered biosolids and biosolids processing facility [BPF] operations contract, and processing of biosolids from on-site septic systems. The BPF, located at the Aerotech Industrial Park, produces a soil amendment for beneficial use in agriculture. Staff from Treatment Plant Operations carry out these related activities.
- **Collection System Operations:** Operation, repair and maintenance of the wastewater collection and trunk sewer system. The system is managed according to three geographic regions with responsibility for over 1700 km of collection pipes, 172 Pump Stations, 21 Combined Sewer Overflow facilities and 85,000 service connections.
- **Septage Treatment Services:** This is an unregulated activity for HW but it provides an essential service to residents who do not have a centralized wastewater service. The septage from septic hauling companies who service these users was accepted at strategic locations within the core sewer service area and at the Aerotech WWTF. With the completion of the upgrade of Aerotech WWTF, most of the septage has been

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diverted to the Aerotech WWTF from the core service area; further optimization of septage services will continue into 2019/20.

- **Fleet and Building Maintenance Services:** Maintenance and repair of approximately 200 vehicles ranging from smaller utility vehicles to large excavation equipment, replacement of vehicles on a life cycle costing basis, and records management. This section of the department is also responsible for maintenance and physical security of corporate buildings and any other logistical support required for efficient operation of the department.

3.2.2 Stormwater Services

The Stormwater Services division is responsible for operation and maintenance of stormwater infrastructure within the public right of way or within easements. This service has undergone significant changes over the past two years and continues to progress to achieve a higher level of service.

- **Collection System Operations:** Operation, repair and maintenance of the stormwater collection and trunk sewer system. The system is managed by shared crews with Wastewater Services within the three geographic regions with responsibility for over 900 km of stormwater collection pipes, 42 stormwater retention facilities and over 500 km of ditches, 2170 cross culverts and 18,000 driveway culverts.
- **Service Review:** With the creation of the Stormwater Engineer position within the Regulatory Services department, resources are allocated to drainage investigations, stormwater billing exemption requests, and operations support. Drainage investigations may be triggered by a customer inquiry on private property or an operational issue on Halifax Water owned infrastructure. The Stormwater Engineer reviews the drainage issues and renders a position which may involve an operational fix or a capital improvement. Complaints stemming from stormwater billing are vetted through the Stormwater Engineer and a decision is provided to the Customer. As per the direction of the NSUARB, Halifax Water has engaged the services of a Dispute Resolution Officer [DRO] to independently review appeals and render an independent Decision on any decisions provided by staff.

3.3 Engineering and Information Services

The Engineering & Information Services [E&IS] Department is responsible for the provision of engineering and technical services relating to the planning, design, construction, and maintenance of water, wastewater and stormwater infrastructure and related asset information. E&IS also provides and supports the hardware, software, application development and related services for the electronic business applications required to

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support the utility. All E&IS staff work out of 450 Cowie Hill Road, with the exception of the IT application development teams being located at a satellite office on Horseshoe Lake Drive in Bayers Lake Business Park.

The E&IS Department has four core areas of responsibility and 7 specific operational sections delivering programs.

- **Asset Management**
- **Infrastructure**
 - Water
 - Wastewater
 - Stormwater
- **Energy Efficiency**
- **Information Management**
 - Engineering Information
 - Information Services

The **Asset Management** section focuses on the development of the Asset Management program [including the overall strategy, inventories, condition and performance assessments], and the development and delivery of annual Asset Management Plans [AMP]. The section is also responsible for modelling and flow monitoring, long term infrastructure master planning [including implementation of the Integrated Resource Plan [IRP], and the development of the 5 Year and 1 Year Capital Budget.

The **Infrastructure** sections are responsible for the design, construction and project management for water, wastewater and stormwater capital projects. These three sections also provide support for capital project prioritization, master planning and asset management relating to the core infrastructure.

The **Energy Efficiency** section is responsible for the provision of engineering services related to energy management and energy efficiency of water, wastewater and stormwater infrastructure.

The **Engineering Information** section is responsible for the corporate Geographic Information System [GIS] including the maintenance and distribution of all record information. The section is also responsible for on-going GIS development including both desktop and mobile GIS applications. This section also supports capital projects and other initiatives through Computer Aided Drafting [CAD] and map production.

The **Information Services** section provides administration of services relating to network resources [storage, servers, printers, etc.], users, access control and network security, server hardware and operating systems. All computer equipment is managed by the IS section. This includes desktops, laptops, monitors, printers and servers. The IS section is the first line of

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support for all IT related problems or requirements. Corporate desktop software is administered by the IS section. The IS section is responsible for the updating and delivery of the IT Strategic Plan including all IT project delivery services.

3.4 Regulatory Services

The Regulatory Services Department continues to support the corporation through the delivery of programs such as Environmental Engineering, Engineering Approvals, Regulatory Compliance, Safety and Security, Stormwater Engineering and Environmental Management System [EMS].

The **Environmental Engineering Group** has historically delivered two key programs, Pollution Prevention [P2] and Inflow and Infiltration [I/I] reduction. This past year members of the group have been providing support for updating Nova Scotia Environment [NSE] permits to operate.

The **Pollution Prevention Group** has coordinated the repairs of five cross connections this past year and providing remedy for a new one in the last quarter of 2018/19. The group has developed a list of medium to high risk customers that, by the nature of their operations, may generate wastes that are harmful to the wastewater collection systems. The group is also using incident data from CityWorks to help focus Pollution Prevention efforts. Through education and inspections, the team is promoting compliance of waste discharges with approved Rules and Regulations.

The **I/I Group** continues to assist the Wet Weather Management Program in locating and addressing private side sources of inflow and infiltration of stormwater into the wastewater systems. Two of Halifax Water's small wastewater treatment facilities, Springfield Lake and Uplands Park are subject to wet weather flows that can impact compliance with NSE operating permits. The group is finalizing investigations in both areas required follow up inspections will continue in to the coming year.

In conjunction with an upcoming capital project on Wanda Lane and Tobin Drive in Dartmouth, the existing sanitary system will be converted to a dedicated stormwater system and a new wastewater system will be installed. As lead up to the project, a stakeholder consultation program is underway. The consultation is to promote the connection of private stormwater components (i.e. sump pumps and footing drains) to the new dedicated stormwater system.

Lake Major and Silver Sands Water Supply Systems required renewals of their associated water withdrawal permits. Those Applications relating to the *NSE Permits to Operate* are currently being reviewed by NSE. The following withdrawals will expire this coming year:

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- Collins Park
- Lake Lamont
- Middle Musquodoboit
- Bennery Lake

Given the nature and complexity of the withdrawal renewal for Pockwock/Tomahawk Lake (expiry 2021), planning and preliminary work for those will commence in 2019/20.

Engineering Approvals continues to be engaged with Halifax Regional Municipality as they continue to implement their Regional Plan, updated in 2014, and on the completion of the Centre Plan. Staff continue to provide technical support as it relates to central services for new development. Last year, Halifax Water project managed the Local Wastewater collection System Assessment for the municipality in support of the potential growth within the city centre and has delivered the final report for their use. Subsequently, the team has commenced discussions on the implementation, timing and coordination with capital projects for some of the infrastructure upgrades needed to support the continued growth within the Centre Plan area.

Engineering Approvals are currently updating the Bedford West Capital Cost Contribution plan to reflect the modifications to the wastewater and water servicing scenarios. Stakeholder Consultation was held in 2018 and will continue in 2019, with an Application to the Nova Scotia Utility and Review Board [NSUARB] by March of 2019.

The land owners of the Port Wallace Master Plan area are currently seeking secondary planning approvals and Halifax Water has been providing technical support for the development of the Master Infrastructure Plan. With the completion of the plan, Halifax Water will be able to evaluate whether the Port Wallace area can be considered as a new Capital Cost Contribution area.

In keeping with the IT Strategic Plan, Halifax Water is engaged with the Municipality to replace their permitting software, HANSEN. The goal over the next two years will be to evaluate the efficiency of utilizing the same permitting software and adopting it at Halifax Water. It is anticipated the implementation of the new software will commence in fourth quarter 2019/2020.

Of note, the Land Management Technician now reports to Corporate Legal Counsel, after a review of the organizational structure and corporate objectives determined that this change would provide broader support to Halifax Water.

The **Safety and Security Group** provides support for the entire organization with respect to the safety training program, including documentation of safety training requirements to ensure employees have the appropriate training to conduct their daily activities and manage risk to the utility.

The Safety and Security Group is also responsible for the development and update of the corporate Emergency Management Plan including emergency response training. As well,

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Halifax Water continues to participate in Public Safety Canada's Regional Resilience Assessment Program for treatment facilities. Facilities are evaluated using the Critical Infrastructure Resilience Tool, identifying areas where security and protection of critical assets can be improved or enhanced. Over the coming year, capital improvements will be undertaken and staff will develop a plan to improve the security profile at various facilities.

The **Regulatory Compliance Group** conducts sampling of the water treatment and distribution systems for bacteria and residual chlorine, ensuring compliance with Canadian Drinking Water Guidelines and Operational permits issued by NSE. Similarly, sampling is completed for wastewater effluent parameters for compliance with permits issued by NSE, consistent with federal regulations. The group is also tasked with compiling and submitting reports associated with the sampling results to NSE. The group continues to support Engineering & IS, and Wastewater Operations staff on changes to regulatory permits including the Wastewater System Effluent Regulations [WSER] and assists in developing an implementation plan for required upgrades.

An audit on *Management of Drinking Water Safety* was completed by the Municipal Auditor General (MAG) in November 2017 which contains nine recommendations. This past year staff have been following up on the recommendations to improve business processes, reduce risk and enhance corporate performance.

Stormwater Engineering continues to triage drainage complaints, support Wastewater and Stormwater Operations and review Stormwater Billing Appeals. With the approval of the Stormwater Credit Program in 2017, Applications are just starting to be submitted for review.

The **Environmental Management System [EMS]** oversees the adherence to the new ISO 14001 – 2015 standard for our certified facilities at Pockwock, Lake Major, Bennery Lake, and Herring Cove. Our facilities were successfully audited against the new standard, with a new certification being issued in August of 2018.

3.5 Corporate Services

Corporate Services consists of 6 divisions, with service to internal and external customers through Finance, Accounting, Procurement, Human Resources, Customer Service, and Metering and Billing.

The **Finance Group** is responsible for development of operating budgets, funding plans for the capital budget, rate applications and financial modeling for business plans. This group assists Engineering in the preparation of capital budgets and confirms availability of funding sources. The group is responsible for forecasting revenues and expenditures, including associated trend analysis, responsible for pension plan administration, internal control testing, and quality assurance activities around financial transactions including payroll.

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The **Accounting Group** is responsible for timely and accurate financial reporting, financial accounting, financial statements, revenue and cash flow, development and implementation of accounting procedures and internal controls, fixed asset accounting, financial analyses and annual audit.

Procurement directs the planning and delivery of Procurement services to the organization ensuring compliance with corporate policies and Provincial legislation. This group develops and implements monitoring and reporting of systems, programs, procedures for inventory and procurement to support acquisition of goods and services to enable delivery of the business plan, operating and capital budget objectives.

Human Resources is responsible for the effective delivery of all Human Resource initiatives including; effective workforce planning, organizational change and development, recruitment functions, disability management, health and wellness initiatives, labour/employee relations, compensation and benefit functions, pension administration, and employment equity.

Customer Care is responsible for customer service delivery to external and internal customers through the Customer Care Centre, and manages all customer contacts, establishes corporate customer service standards, goals and objectives, and coordinates business processes in the area of customer service with a focus on service and process improvement. Regular root cause analysis is completed with process improvements implemented within the Customer Care department with recommendations provided to other departments.

Metering and Billing is responsible for end to end functions of meter installation, maintenance, reading, sampling, testing, establishment of standards, and billing customers in a timely and accurate manner.

The most significant objectives for Corporate Services in the 2019/20 year are:

- SAP S/4 Hanna upgrade. In late 2018/19 Halifax Water established a project team to begin planning to upgrade the corporate enterprise resource management system. This project will impact almost all business processes and employee groups.
- Implementation of a new payroll system. In 2018/19 Halifax Water issued an RFP for a payroll system. The successful proponent offers a software as a service solution that will allow Halifax Water to automate time and attendance tracking, eliminate many manual paper processes, reduce opportunities for error and fraud, provide employee self-service functionality, and improve pension administration. A project team has been established and the new system will be implemented January 1, 2020.
- Review impervious area used for stormwater billing, update satellite imagery, and business processes to ensure impervious area from new development is captured accurately.

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- Continuation of the Advanced Meter Infrastructure (AMI) project. This item is discussed in greater detail in section 5.2. The project was approved by the NSUARB on October 6, 2016 and will be completed in Fall 2019.
- Implementation of a Corporate Customer Service Strategy that aligns with the Municipality's Corporate Customer Service Strategy.
- Completion of the telephony upgrade, and continued enhancement of Customer Care. An RFP for new call centre telephony was issued in 2018/19 and new telephony will be implemented in Spring of 2019. Customer Care Centre (CCC) performance against operating targets significantly improved in 2018/19. In 2019/20, all business processes in the CCC will be reviewed to identify opportunities to further improve the current Customer Relationship Management system (Cayenta), performance reporting, knowledge base and scripts for customer care representatives, and workflow and integration with the Computerized Maintenance Management System (CMMS). This will all be underpinned by the introduction of a customer care quality program starting with call contact and eventually spanning all means of customer contact (email, face to face etc.)
- Implementation of a customer web portal. Halifax Water is developing a customer portal in three phases. The first phase was implementation of a new internet site in 2018/19 which was launched in January 2019. In 2019/20, the second phase will implement a customer portal where customers can access information about their water consumption, account information and billing characteristics. The final phase of customer portal development will occur in 2020/21 with additional on-line transactional functionality such as on-line service requests, bill presentment and bill payment.
- The business case and process to implement monthly billing for customers that are currently billed on a quarterly basis will be finalized in 2019/20, with a view to implement monthly billing in conjunction with the next rate application. The work on monthly billing carries forward from 2018/19 as it is linked to the timing of the AMI (Customer Connect) project. It is necessary to understand how many customers will have their meters manually read in order to finalize the business case for monthly billing.
- Completion of collective bargaining with CUPE Locals 227 and 1431 and implementation of the new agreements.
- Continuing work on Civility and Respect in the Workplace, the Health and Wellness program introduced last year, and implementation of some new organizational supports and programs in relation to Mental Health.
- Implementation of the results from the January 1, 2019 Actuarial Valuation of the Halifax Water Employees' Pension Plan, which may change Employer and Employee contribution rates in 2019/2020.

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- Updating the Halifax Water Rules and Regulations. By the end of 2018/19 Halifax Water will file an Application to the NSUARB to update the Rules and Regulations. These amendments are largely housekeeping in nature and this Application will not propose any adjustment to rates for water, wastewater or stormwater service.

4. BUDGET SUMMARY

4.1 Capital

Halifax Water’s 2012 IRP identified a 30 year capital investment plan valued at \$2.6 Billion [net present value]. As part of the utility’s overall mission, the capital budget program focuses on three main strategic drivers; asset renewal; regulatory compliance; and growth. The capital program helps ensure that Halifax Water continues to provide world class services in a cost effective and efficient manner with a focus on long term sustainability.

The Capital Budget includes an annual 1 year and 5 year capital plan. Capital projects are defined as newly acquired or constructed item with a value greater than \$5000 and a life expectancy beyond one year. The Capital Budget document includes four general categories: Water, Wastewater, Stormwater and Corporate Projects. Corporate projects are assigned to the three prime asset classes, based on cost of service allocations, approved by the NSUARB. The detailed 2019/20 Capital Budget is attached as Appendix C.

The summary totals for the three asset classes for the 1 Year and 5 Year capital budget are as follows:

Asset Class	Year 1 2018/2019	Year 1 - 5 2018/2019 - 2022/2023
Water	\$32,843,000	\$246,302,000
Wastewater	\$33,979,000	\$303,880,000
Stormwater	\$10,526,000	\$ 62,110,000
TOTAL	\$77,348,000	\$ 612,292,000

The capital program balances near-term needs with long-term investments across all asset classes.

The following chart shows the current proposed 5 year capital expenditure plotted against the IRP capital expenditure recommendation. The chart indicates a continued general increase in capital expenditures towards the target level.

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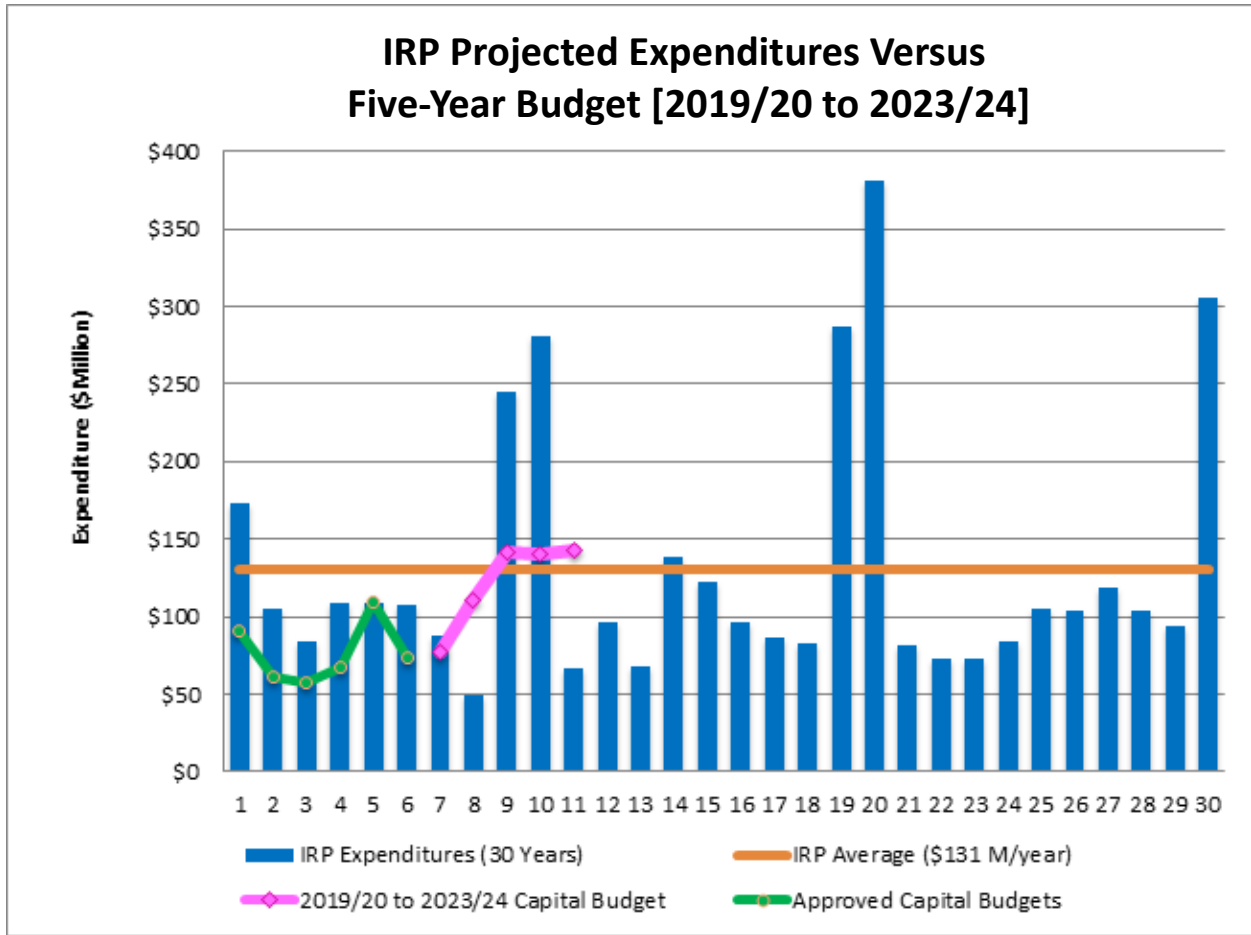


Figure 3 – IRP Projected Expenditures vs Proposed Five Year Capital Budget

The following provides highlights of the 2019/20 Capital Budget:

Water: Major Water capital projects include:

- Distribution System Main Renewal Program in conjunction with the Municipality’s Streets program;
- Lead Service Line Replacement Program;
- Lucasville Road Transmission Main;
- J.D. Kline & Lake Major Water Supply Plant Upgrades.

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Wastewater: Major Wastewater capital projects include:

- Collection System Renewal Projects integrated with the Municipality's Streets Program;
- Collection System Trenchless Rehabilitation Program;
- Wanda Lane Sewer Replacement;
- Wastewater Lateral Replacements;
- Halifax North Peninsula Sewer Separation Program.

Stormwater: Major Stormwater capital projects include:

- Stormwater System Renewal Projects integrated with the Municipality's Streets Program;
- Driveway & Cross Culvert Renewal Program; and
- Ellenvale Run Retaining Wall System Replacement

Corporate Projects: Major Corporate Projects include:

- IT Strategic Plan Implementation Year 2;
- Corporate Flow Monitoring Program;
- Final Phase of Customer Connect (AMI) Program; and
- East/Central Operations Facility Land Acquisition.

The Capital Budget is funded from a variety of sources including asset depreciation accounts, debt, reserves, capital cost contributions and external cost sharing.

Capital funding sources:

- Depreciation [funded within the rates] \$25,160,108
- Debt \$39,904,892
- Regional Development Charges \$7,932,000
- External cost sharing (Federal & Provincial) \$4,085,000
- External cost sharing (Municipal) \$253,000
- Energy rebate \$10,000
- Capital Cost Contributions \$3,000

The Debt Strategy as approved by the Halifax Water Board, and accepted by the NSUARB, provides a funding strategy that is fair, equitable and cost effective. The debt strategy sets limits for the debt service ratio [DSR] at 35% and a target debt to equity ratio of 40%/60%.

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The funds for the overall Capital Budget will be generated from a combination of sources, as detailed below. The planned utilization of debt is consistent with the Debt Strategy. Halifax Water will manage risk around projected Regional Development Charges through reprioritization of growth projects or additional utilization of debt if required.

2019/20 Capital Budget Funding Sources

Water:	Depreciation	\$9,631,878
	Debt	\$19,116,122
	RDC	\$10,000
	External Funding Building Canada & CWWF	\$4,085,000
	Capital Cost Contributions	\$0
	TOTAL	\$32,843,000
Wastewater:	Depreciation	\$14,035,907
	Debt	\$11,858,093
	RDC	\$7,922,000
	External Funding Halifax Regional Municipality	\$150,000
	Capital Cost Contributions	\$3,000
	Energy Rebates	\$10,000
TOTAL	\$33,979,000	
Stormwater:	Depreciation	\$1,492,323
	External Funding Halifax Regional Municipality	\$103,000
	Debt	\$8,930,677
	TOTAL	\$10,526,000
TOTAL CAPITAL FUNDING:		\$ 77,348,000

4.2 Operations

The operating budget prepared for 2019/20 is based on year two of the Five Year Business Plan approved by the Halifax Water Board in January 2018. There are no planned rate increases for water, wastewater and stormwater in 2019/20. The operating budget shows a loss of \$14.0 million on an accrual basis, and \$8.4 million on a cash basis. The cash basis reflects the requirements of the NSUARB Accounting and Reporting Handbook for Water Utilities which is used for rate making purposes. Halifax Water's operations have resulted in surpluses in recent fiscal years and Halifax Water is planning to delay increasing rates in 2019/20 by utilizing accumulated operating surplus from previous years. The detailed 2019/20 Operations Budget is contained in Appendix D. A summary version of the Operations Budget is shown in Table 3 – Budget Summary on page 26.

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Some of the primary operating budget drivers and assumptions are:

REVENUES:

The current rates for water and wastewater service took effect April 1, 2016. The current rates for stormwater service came into effect July 1, 2017 (revenue requirements for stormwater service did not increase, but the rate design changed). The majority of Halifax Water's revenues come from rate-regulated activities, with approximately 65% of water and wastewater revenues coming from volumetric rates and 35% from base charges. Operating revenues are projected to be \$3.5 million higher than the 2018/19 budget, based on the following assumptions:

- Volumetric water and wastewater revenues are based on projected actual consumption for 2018/19 with no decrease projected. As at December 31, 2018 on a rolling 12 month basis, consumption was up 2.1% above prior year, and 4% above budget. This is attributable to many factors – growth in customers, improved meter accuracy, and weather conditions.
- Stormwater revenue is budgeted based on projected 2018/19 stormwater water revenues. Stormwater revenues in 2018/19 are less than budgeted and a project has been initiated to ensure impervious area from new development is being captured.
- It is difficult to project new customer connections. As at the end of the 3rd quarter in 2018/19 there were approximately 500 new customer connections. Based upon an upward trend in residential building permits in the fall of 2018, it is likely new customer connections in 2019/20 may be higher.

Alternative Revenue - Revenues from unregulated business activities are decreasing in 2019/20 due to lower projected septage tipping revenues. Septage tipping volumes are down 16.9%. Allocations of some expenses between regulated and unregulated will be reviewed in 2019/20 and this may result in changes to projected unregulated revenues in 2019/20 but would be immaterial in the context of the overall revenue budget. Unregulated revenues help to pay for some expenses which would otherwise be funded by rate-regulated activities, and are also used to fund unregulated expenses.

Unregulated revenues are projected to be \$1.6 million in 2019/20, a slight decrease from the budget of \$1.8 million in 2018/19.

EXPENSES:

Halifax Water's Operating Budget is shown on an accrual basis to provide better information for decision-making and be reflective of best practice for budgeting. There is an accrued amount regarding the liability for future employee benefits (pension) as calculated under IFRS that, for rate making purposes, is not currently included in the revenue requirements. There are also differences between the treatment of debt servicing expense and calculation of depreciation.

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The utility faces pressure associated with growth, asset renewal, and compliance with regulatory requirements, as described in the Integrated Resource Plan. Halifax Water has taken significant steps to reduce risks in these areas with the development of the regional development charge, an asset management framework and capital projects to upgrade wastewater treatment facilities.

The largest components of Halifax Water's consolidated operating budgets are salaries & benefits, electricity, debt servicing, depreciation, and chemical costs.

Salaries and Benefits - The budget for 2019/20 includes an allowance for 25 positions in total, the majority of which are new positions, however there are 2 full time equivalent positions previously approved but vacant during 2018/19. This is inclusive of 5 term positions, 1 within Customer Service and the remaining attached to Engineering and Information Services. Also included are 2 seasonal positions within Water Services. As mentioned above, if all positions are filled, this would necessitate an additional \$1.3 million in operating expenses. As noted above, a portion of the new salaries will be recovered from capital projects.

The annual increase included in the operating budget for existing employees is based on non-union salaries as approved by the Halifax Water Board in November 2018, and unionized wages based on assumptions, with some allowance for band adjustments, step increases, and re-classifications.

Energy – Budgets were established based on estimates for electricity, fuel, oil and natural gas rate increases in each specific year. The impact of these increases is expected to be partially offset by the formal Energy Management Program.

- Electricity – 1.5%
- Furnace Oil – 5.0%
- Natural Gas – 5.0%
- Fuel is projected to increase 18% over 2018/19 (\$1.30 vs \$1.10 retail or \$1.12 vs \$0.95 wholesale through the Municipality).

Debt Financing – Debt payments are budgeted to support the new debentures planned for the 2019/20 additions to utility plant in service. The amount and timing of the increases will be determined by the completion of the projects and the financing rates and options available. It is estimated total debt servicing will decrease to \$28.2 million; a 10.2% decrease from the 2018/19 budget. The capital financing strategy is designed to maintain a debt service ratio of 35% or less and to use a mixture of federal/provincial infrastructure funding, development related charges (reserves), depreciation, and debt. Long-term debt is projected to be \$257 million as at March 31, 2020.

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Depreciation - As Halifax Water's assets and future capital budgets increase so do depreciation expenses. Depreciation is an integral funding source to support renewal of existing infrastructure as well as new infrastructure and upgrades to meet future requirements related to servicing demands and changing environmental regulations. Depreciation is projected to increase to \$25 million in 2019/20 from \$23.4 million in the 2018/19 budget, which is an increase of 7.0%.

Dividend to the Halifax municipality - The water dividend agreement was renewed in September, 2014 for a 5 year term (April 1, 2015 - March, 2020). The dividend is calculated as 1.6% of the water system rate base and is projected at \$5.1 million in 2019/20 which is comparable to 2018/19.

Chemical Costs - Chemicals are tendered annually in January for optimal pricing. Chemical cost increases of 5.0% are anticipated for next year.

On a consolidated basis, operating expenses are projected to increase by \$9.0 million (8.1%) to \$120.8 million from \$111.7 million. Water Service expenses are projected to increase by \$4.7 million, Wastewater Service by \$3.1 million, and Stormwater Services by \$1.2 million. Many categories of expense are increasing at a rate greater than CPI, particularly depreciation which is 20.8% of total operating expenses and is increasing at 7.0 % compared to 2018/19 as a result of increasing capital investments.

Operating revenues are projected to increase by \$3.5 million or 2.6%. Non-Operating revenues are projected to increase by \$363 thousand or 36.1% to \$1.4 million compared to 2018/19, as shown in Table 3 - Budget Summary below:

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Table 3 - Budget Summary

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1/18 MAR 31/19	PROPOSED BUDGET APR 1/19 MAR 31/20
OPERATING REVENUES	\$138,145	\$135,182	\$138,727
OPERATING EXPENDITURES	\$104,452	\$111,710	\$120,756
OPERATING PROFIT	\$33,694	\$23,472	\$17,971
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$694	\$480	\$816
PNS FUNDING HHSP DEBT	\$2,000	\$0	\$0
MISCELLANEOUS	\$1,793	\$526	\$553
	\$4,486	\$1,006	\$1,369
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$7,884	\$8,560	\$8,181
LONG TERM DEBT PRINCIPAL	\$21,247	\$22,601	\$19,822
AMORTIZATION DEBT DISCOUNT	\$202	\$245	\$202
DIVIDEND/GRANT IN LIEU OF TAXES	\$4,774	\$5,142	\$5,147
MISCELLANEOUS	\$269	\$16	\$22
	\$34,376	\$36,564	\$33,374
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES	\$3,804	(\$12,086)	(\$14,034)
<i>Adjustments:</i>			
<i>Pension accrual</i>	\$5,015	\$2,940	\$5,668
<i>Net Profit (Loss) on a Cash Basis</i>	\$8,819	(\$9,146)	(\$8,366)

As of March 31, 2018, Halifax Water had an accumulated operating surplus of \$20.5 million. The projected operating result at March 31, 2019 is a \$5.0 million loss, reducing the available surplus to \$15.4 million (based on the December 2018 projections).

Halifax Water is targeting maintaining an accumulated operating surplus of 3% of expenses (operating and non-operating) to mitigate risk. Accumulated operating surplus can be used to offset operating losses, or can be used to fund future additions to utility plant in service, subject to NSUARB approval. Based on the projected financial position of the utility at March 31, 2019 and the proposed operating budget for 2019/20, the accumulated operating surplus would be approximately \$1.4 million as at March 31, 2020, as shown in Table 4 – Operating Surplus (Deficit) below. The \$1.4 million projected Operating Surplus equates to 0.9% of total expenses which would be less than the 3% target for accumulated operating surplus. It is likely that there is still some conservatism in the third quarter (December 2018)

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projections, and that the available accumulated surplus may be higher. If the year-end position does not add to the projected accumulated operating surplus, it may be necessary to file a Rate Application in the Fall of 2019.

Table 4 – Operating Surplus (Deficit)

Operating Surplus (Deficit)					
		Total	Water	Wastewater	Stormwater
2016/17 Fiscal Year					
	Balance, beginning of year	\$7,819,138	\$650,864	\$1,323,329	\$5,844,945
	Operating income (loss) for the year	\$8,859,000	\$3,731,000	\$3,369,000	\$1,759,000
	Balance, end of year	\$16,678,138	\$4,381,864	\$4,692,329	\$7,603,945
2017/18 Fiscal Year					
	Balance, beginning of year	\$16,678,138	\$4,381,864	\$4,692,329	\$7,603,945
	Operating income (loss) for the year	\$3,803,000	\$1,043,000	\$2,884,000	(\$124,000)
	Balance, end of year	\$20,481,138	\$5,424,864	\$7,576,329	\$7,479,945
2018/19 Fiscal Year					
	Balance, beginning of year	\$20,481,138	\$5,424,864	\$7,576,329	\$7,479,945
	Projected operating income (loss) for the year	(\$5,044,000)	(\$1,840,000)	(\$2,456,000)	(\$748,000)
	Projected balance, end of year	\$15,437,138	\$3,584,864	\$5,120,329	\$6,731,945
2019/20 Fiscal Year					
	Balance, beginning of year	\$15,437,138	\$3,584,864	\$5,120,329	\$6,731,945
	Projected operating income (loss) for the year	(\$14,034,000)	(\$3,603,000)	(\$7,463,000)	(\$2,968,000)
	Projected balance, end of year	\$1,403,138	(\$18,136)	(\$2,342,671)	\$3,763,945

Halifax Water has a goal to keep rates for combined services below 2% of median household income, well below the rate affordability threshold recommended in several industry best practice studies. The cost of annual combined services for an average household is projected to be approximately 0.83% of median household income in 2019/20.

4.3 Cost Containment

Halifax Water reports semi-annually to the Halifax Water Board, and annually to the NSUARB the results of cost containment activities. The next cost containment report will be filed with the NSUARB by June 30, 2018. Some of these initiatives are on-going, and others are one time in nature. The cost containment initiatives from last year (2017/18), along with amounts of an ongoing nature from 2013/14 to 2016/17 inclusive reflected cost savings of approximately \$6.6 million. The inclusion of initiatives from prior years reflects an intentional focus on sustainable results over the long term.

Halifax Water continues to develop a cost containment culture. As salaries and benefits are the largest element in the operating budget, a significant opportunity exists to improve payroll processing, workforce planning and the staffing process. Another area of

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opportunity is productivity through enhanced business processes and technology, performance management, and improved time and attendance tracking.

5. STRATEGIC INITIATIVES

5.1 Customer Service Enhancements

The most recent Customer Service (Quality of Service) Survey indicated that Halifax Water continues to perform admirably in with most respondents offering positive ratings about the service. Many initiatives are underway that ultimately will help us continue to enhance service to customers to keep them satisfied.

Customer Care Centre – This year will see continued enhancement of customer service with a new website, implementation of a new telephony system, and implementation of a Web Portal in conjunction with the AMI project. The AMI project is discussed separately in Section 5.2

A Corporate Customer Service Strategy will be implemented in 2019/20 and as the utility continues to establish service levels and measure performance against those service levels, improvements are expected.

Dispute Resolution – The process to escalate customer issues and resolve them is continuing to evolve. In 2017/18, an independent Dispute Resolution Officer was added. As part of its on-going commitment to best-in-class customer service, Halifax Water, with the approval of the NSUARB, has established the position of Dispute Resolution Officer, a part-time independent adjudicator who will investigate service or billing complaints from customers who wish to pursue a complaint after Halifax Water has attempted to resolve it through the regular customer complaint resolution process.

5.2 Advanced Metering Infrastructure

Halifax Water began looking at the feasibility of Advanced Metering Infrastructure (AMI) in 2012. AMI is a system whereby, in lieu of meter readers walking routes, or driving routes to read meters with radio devices, a fixed network of telemetry devices is established over the service area to read meters on a much more frequent basis (typically hourly).

On October 6, 2016, the NSUARB approved a \$25.4 million dollar multi-year project to complete the AMI project. This is a significant project that will impact all customers and change how the utility provides service. The project was formally launched in November 2016 and in the summer of 2017 Halifax Water began the deployment to install or upgrade 83,000 AMI devices. By March 31, 2019, there will be approximately 50,000 AMI devices installed with an anticipated completion date of Fall 2019.

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In addition to streamlining the meter reading process and reducing its cost, AMI promises many features that will improve the level of service Halifax Water can offer its customers.

These include:

- The ability to offer monthly billing to residential and small commercial customers thus making it easier for customers to manage cash flow and automated payments. Large institutional, commercial and industrial customers are currently billed on a monthly basis.
- Billing errors will be reduced and estimated meter readings will be eliminated.
- Halifax Water will be able to alert customers to high consumption due to things like plumbing leaks, almost as they happen, reducing billing disputes and high bill amounts.
- Customers will have the ability, through a web portal, to manage their water consumption and see the effect of any conservation measures they take.

AMI will provide much more data about customer consumption and distribution system operations. This will enable earlier identification of distribution system leaks. Overall, it will improve the customer focus of the organization by providing the ability to identify and rectify customer issues proactively, rather than after the fact upon the customers' receipt of a high bill. This will result in reduced costs for billing and collection, and reduce the need for the high cost activity of sending technicians to customer homes.

This upgrade to AMI will enable two-way digital communication between the utility and its customers. This technology forms the backbone of the utility of the future, which means more customer-focused and efficient service. Over time, Halifax Water will be more responsive to customer inquiries based on better data, provide enhanced leak detection services, and move to monthly billing which allows customers to manage their budgets more effectively.

The decision to install AMI technology is part of Halifax Water's broader goal of continuously improving the overall water infrastructure and customer service experience. This will allow for more effective system operations and cost savings. From an environmental standpoint, Halifax Water will reduce its environmental footprint due to reductions in vehicle travel to read meters and perform other basic services, which will be completed remotely once the meters are installed.

5.3 Information Technology Strategic Plan

In 2018, Halifax Water established a 5 year Information Technology Strategic Plan. The Information Technology strategy focuses on business outcomes such as improved customer experience, better business analytic tools, improved and secure IT systems. With successful implementation of the year 1 projects, the strategy was reviewed and recalibrated for 2019/20. The major IT initiatives for the 2019/20 business year are:

Customer Portal: The application will allow customers that are on AMI meters to see their water consumption data and some basic stormwater billing information. The application will be incrementally expanded in future years to add new online services for customers.

Computerized Maintenance Management System (CMMS): Continue to roll out the CMMS to other business units and enhance the functionality that is operational at this time. The specific areas of improvement include:

- Review / assessment of current implementation of CityWorks, including assessment of Work Order Types, and Work Order Life Cycle looking for process inconsistencies, improvement opportunities.
- Analysis of information / reporting requirements to best communicate operational effectiveness statistics from CityWorks to Management
- Enhanced Integration with – Procurement, Skilled/Resources, Fleet Management, Non Moving Assets, Finance, GIS, Asset Management, Customer Experience, Work order/Resource Routing through system interfaces or business process improvements
- Expansion of CityWorks to additional business units and addition functionality
- Continue CityWorks roll-out across any WSP or WWTF Facility areas not completed in Deployment 3

Data Analytics: Select and implement better analytics tools for asset management.

SAP System Upgrade: Project will upgrade the current software version to S/4 Hana providing current technology, improved user interface, and functional flexibility.

Regulatory Reporting: The goal of the program is to make regulatory requirements for Reporting (Capturing the Data and Reporting back to authorities) an integral part of data collection, synthesis, analysis and dissemination to improve – customer service, HW Operations and cost to manage water, wastewater and stormwater assets.

5.4 Wet Weather Management

Like many municipalities and utilities across North America, sections of Halifax Water's sanitary sewer system are subject to dramatic flow increases in response to precipitation events. These wet weather flows can lead to sanitary sewer releases, sewer backups/basement flooding, increased operation and maintenance cost, treatment process upsets, and treatment facility effluent quality & capacity issues. Recognizing the impacts of wet weather generated flows on the system, Halifax Water developed a program to systematically address the negative impacts of wet weather on the collection system and wastewater treatment facilities. Conceived in 2013, the Halifax Water wet weather management program [WWMP] developed a strategy to investigate and identify cost effective remedial measures aimed at efficiently managing wet weather impacts within the sanitary sewer system. The program is long term in nature and has followed a phased implementation approach to meet goals of the strategy.

Halifax Water maintains approximately 1,000 km of wastewater sewers, 300 km of combined sewers, 14 wastewater treatment facilities, and 172 wastewater pumping stations. Based on age, historical construction practices and materials, maintenance, number of connections as well as other factors, there is significant opportunity for infiltration and inflow [I&I] of surface runoff and ground water into the wastewater system. The WWMP systematically identifies opportunities to employ strategies to:

1. Reduce the quantity of wet weather flows entering the sanitary sewer system, and/or
2. Identify storage opportunities for wet weather flows which will allow the system to convey and treat these flows after a precipitation event when capacity in the system is available.

The approach allows the most cost effective strategy to be implemented in each target sewershed.

While the program phasing is prescriptive; it is important to revisit the objectives of the program periodically and adjust where necessary based on lessons learned. The evolution of the WWMP followed a phased approach to get to its current state.

- **Phase I:** The initial phase of HW's WWMP involved initiation of the program and its structure. It was realized early that there is no "one size fits all" solution to wet weather management and the program needed to reflect this when implementing strategies. The initial program organizational structure was comprised of a wet weather steering committee and a wet weather action committee. Key contributors continue to be engaged in the program with monthly meetings between the steering committee and the implementation team.
- **Phase II:** Phase II of the program identified individual sewersheds that demonstrated a need for wet weather strategies. At the time, there was limited flow information available to make informed prioritization decisions in the service boundary. In the absence of measured

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flow information; pump station run time information was used as surrogate to flow data. Wet weather impacts were characterized in the entire service boundary using existing flow information and pump runtime data and a prioritization matrix developed. Since that time, significantly more flow monitoring is available and has almost completely negated the need for the use of pump run time data.

- **Phase III:** From the prioritization matrix, pilot sewersheds were strategically identified so that specific wet weather management techniques could be assessed. Pre and post remediation flows are being analyzed and cost data collected in each of the project areas and a cost benefit analysis completed on each of the remedial methods. Post remediation flows will continued to be monitored in the pilot sewersheds to assess whether any rehabilitated areas show a long term increase in wet weather flows.
- **Phase IV:** With the information collected from the pilot and other wet weather reduction projects, wet weather management projects are being identified and implemented in other sewersheds. This approach allows Halifax Water to identify the most cost effective strategies to manage Halifax Water’s wet weather flows using system specific historical data. Since the initiation of the program, 205 sewersheds have been identified with varying degrees of impacts from wet weather events.

The near term [2019/2020] goals for Halifax Water’s Wet Weather Management Program include:

- 1. Continuation of the Pilot Projects:** Halifax Water’s WWMP is currently running 5 pilot projects: Stuart Harris Sewershed, Cow Bay Rd., Leiblin Park, North Preston, and Crescent Ave. These pilot areas were chosen to enable Halifax Water to assess the effectiveness of the various wet weather management strategies and collect rehabilitation cost information. In 2018/19 “top hat” lateral lining was completed in the Stuart Harris and Leiblin Park sewersheds. 2019/20 will see continued flow monitoring and data analysis in the pilot areas.
- 2. Refinement of Cost Benefit Analysis:** Phase IV of the WWMP involves applying a cost benefit analysis of the various strategies to manage Halifax Water’s wet weather flows throughout the entire service boundary. As expected, the pilot sewersheds are demonstrating a significant reduction in rain derived inflow and infiltration [RDII] as the various wet weather management strategies are implemented. The financial cost of the RDII reduction will be normalized so that the information can be applied to the entire service boundary and compared to more traditional approaches to wet weather management such as capacity increase and storage. This analysis will closely review the available flow data and cost information from the recently completed Fairview/Old Clayton Park project and assess its applicability for similar scope and cured in place pipe [CIPP] projects in other sewersheds.
- 3. Fairview - Old Clayton Park I&I Program:** The analysis of flow monitoring data, undertaken as part of the West Region Wastewater Infrastructure Plan identified the potential for a significant reduction in [RDII] in the Fairview - Old Clayton Park and

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Bridgeview areas. With the goal of reducing peak flows by approximately 200 L/s, a multi-year I&I reduction program was initiated in 2017 with overall project planning, studies and engineering design activities occurring in the 2017/18 year. For the 2018/19 year, CIPP lining of approximately 11 km of pipe was completed as part of Phase 1 of this project and included areas in Fairview and Old Clayton Park. For the 2019/20 year, of the next phase of the lining project will see approximately 15 km of CIPP lining completed. 2019/20 will see smoke testing completed with the goal of identifying both public and private inflow sources. Private side inspections will also be performed to identify and potentially eliminate illegal stormwater connections on private-property. Flow monitoring and data analysis will be performed to quantify RDII reductions for the project area and assess the effectiveness of the rehabilitation activities during all phases of the project.

- 4. Central and East Region Wastewater Infrastructure Plan:** Work on the Wastewater Regional Infrastructure Plan in the East and Central regions is expected to be completed in 2019. The WWMP will continue to work with the project team in strategy selection for management of wet weather flows. Preliminary work has identified priority areas and flow monitors will be deployed in 2019/20 as the initial phase of the wet weather investigations.
- 5. Enhanced Decision Matrix:** An enhanced prioritization methodology/decision matrix is being developed to assist in identifying areas that can benefit from interventions in a cost effective manner. The decision matrix will define the various I&I control, and Sanitary Sewer Evaluation Survey [SSES] investigation techniques and when they will be used, establish the criteria for intervention, and formalize how results are measured and reported.
- 6. Program Expansion to the Entire Service Boundary:** Applying the enhanced decision matrix, the program will continue to expand over the next five years to identify and implement wet weather projects as well as increase the base dataset that is used in decision making. In the next business year, the program will continue with SSES activities in the large Fish Hatchery Park and Bissett Lake Pump Station sewersheds with the goal of identifying the sub-sewersheds where the implementation of wet weather projects can be feasibly implemented.
- 7. Dingle and Whimsical Lake Sewersheds:** In recognition of existing sanitary sewer overflows [SSOs], the West Region Wastewater Infrastructure Plan flagged the need for further investigation of the catchment upstream of the Roaches Pond Pumping Station. Both the Dingle and Whimsical Lake sewersheds are tributary to the Roaches Pond facility and have historically seen impacts from wet weather events. During these events, the Dingle Pumping Station experiences sanitary sewer overflows and basement flooding and system surcharging has been documented downstream of the Whimsical Lake Pumping Station. Flow monitoring and CCTV inspections were conducted in both sewersheds in 2018. In 2019/20, 4.6 km of CIPP projects are planned with the goal of reducing SSOs and basement flooding incidents, and reducing peak flow at the Roaches Pond Pumping Station.

5.5 Resource Recovery

The Halifax Harbour Solutions Project included a 10 year contract for Biosolids Processing and Biosolids Transportation, commencing in 2006. There were minor adjustments to the contract duration because of project delays and temporary shutdown of the Halifax WWTF in relation to the flooding incident in January, 2009. The Biosolids Transportation Agreement expired on October 31, 2017 and the Biosolids Processing Agreement is due to expire in March 2019. A new Biosolids Transportation Agreement was executed in October 2017 with a new service provider with significant cost savings. Halifax Water staff have been reviewing the Biosolids Processing Agreement during 2018/19 with several options considered for short and long term solutions. In conducting this exercise, staff are investigating overall resource recovery from this by-product stream.

5.6 Environmental Management System Expansion

ISO 14001 is an international standard for environmental management systems [EMS] essentially it is a system of procedures, records and process to manage environmental issues.

The benefit of implementing an EMS is that it drives a process of continual improvement towards meeting defined environmental goals and objectives. Minimizing environmental impacts becomes one of the defined primary goals, and standard processes are put in place to identify issues and direct improvements through documented standard operating procedures. The standard pertaining to Environmental Management Systems [EMS] is 14001- 2015 and requires an organization to:

1. Establish an environmental policy.
2. Identify environmental aspects that can impact the environment.
3. Identify our applicable Compliance obligations legal and regulatory requirements.
4. Set appropriate environmental objectives and targets.
5. Establish programs to implement our policy, achieve objectives and meet targets.
6. Periodically audit and review activities to ensure that the policy is complied with and the environmental management system remains appropriate.
7. Be stewards of the environment and local community.
8. Be capable of adapting to changing circumstances.

Halifax Water will work towards getting the remaining wastewater facilities certified, starting with the Dartmouth WWTF. It is anticipated that all of the WWTFs will achieve the ISO Designation by 2020. Planning for a corporate wide EMS program will be initiated in 2019/20.

5.7 Energy Management

Through its Energy Management Program, Halifax Water is committed to creating and ensuring an ongoing focus on sustainability and energy efficiency throughout all operating areas. This program, is carried out in relation to Halifax Water’s Energy Management Policy through the Energy Management Steering Committee. The annual Energy Management Action Plan [EMAP] defines the goals, objectives, accountabilities, and structure for activities related to energy efficiency, energy recovery, greenhouse gas [GHG] reductions, and environmentally responsible energy use.

For 2019/20 and beyond, initiatives have been identified in the following areas:

Infrastructure / Operational Improvements

Capital projects that will result in improved energy efficiency, energy recovery, GHG reductions and operational cost savings have been identified throughout Halifax Water’s infrastructure. Projects being implemented or considered include:

<i>Various Electrical/Mechanical System Upgrades</i>	<i>UV Disinfection Upgrades</i>
<i>HVAC System Re-Commissioning</i>	<i>Pumping System Upgrades</i>
<i>HVAC & Building Envelope Upgrades</i>	<i>Pump/Meter Chamber Upgrades</i>

New construction capital projects [e.g. wastewater treatment facilities, pumping stations, etc.] are also reviewed at the conceptual and detailed design stages to ensure best-in-class energy efficiency and the lowest life cycle costs throughout the life of the asset.

GHG Emissions Inventory

While GHG emissions from the majority of Halifax Water’s operations is being closely monitored and accounted for, a more formalized approach for collecting and reporting of this information is being considered and developed. In addition to primary fossil fuel emissions from our facility operations (i.e. heating oil and natural gas), secondary or indirect emissions from electricity use (i.e. NSPI emissions) are also being tracked and reported on an annual basis. Furthermore, a methodology is also being developed to track emissions from our fleet vehicles. Ultimately, the goal will be to use GHG emissions as an important metric within Halifax Water’s annual Corporate Balanced Scorecard/Continuous Improvement system.

Renewable Energy Generation

Halifax Water has identified renewable energy as an important way of offsetting energy costs and increasing revenue that will help the utility to significantly reduce energy use and greenhouse gas emissions in the region. Two key project areas have been identified: renewable energy and energy recovery from both water and wastewater systems.

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To date, two renewable energy projects have been completed: the Pockwock Community Wind Farm, located near Pockwock Lake and the Orchard In-Line Energy Recovery Turbine, located in Bedford. These projects are operating above expectations, and will continue to generate revenue for the utility for decades to come.

Energy recovery from process or waste streams is recognized as one of the biggest opportunities available to society. Recoverable energy is everywhere – in solid municipal/residential waste streams, industrial by-products, and water and wastewater streams. Halifax Water has significant recoverable energy resources available in both its water and wastewater streams. Halifax Water is currently focusing efforts on three specific energy recovery projects.

Biosolids Energy Recovery

Halifax Water currently supplies over 35,000 tonnes per year of partially de-watered sewage sludge to its Aerotech Bio-Solids Processing Facility [BPF]. Currently, this sludge is turned into a soil amendment that can be used as fertilizer for topsoil manufacturing, sod growing, horticulture, and land reclamation. Energy recovery from biosolids is one of the most developed opportunities for treatment plants. This is commonly achieved through anaerobic digestion of wastewater sludge.

Halifax Water's Mill Cove WWTF and Lakeside Timberlea WWTF are equipped with anaerobic digesters and the gas generated is utilized for digester operation and excess gas is used for space heating in the plants. The Mill Cove WWTF digesters were cleaned and refurbished in 2017; it is expected that the gas yield will increase as a result. The HHSP facilities and other small facilities have sludge dewatering equipment on site as the prime resource for biosolids that are utilized as soil amendment for beneficial use. Halifax Water expects to continue this practice in the near future considering that the agricultural soil amendment program is very successful. There are several emerging technologies in the industry that show promise for alternative uses of biosolids for energy production; Halifax Water have been reviewing these technologies to determine the best opportunity; however, it must be developed cognizant of the risks that are associated with the complex issue of biosolids management.

Halifax Water continues to explore opportunities and options for the alternative re-use of biosolids as an available energy source that can contribute to overall GHG reductions and offset annual energy costs.

Cogswell District Energy System

A study was completed in 2016 to determine the feasibility and preliminary business case for an Ambient Temperature District Energy System [ATDES] within the Cogswell Redevelopment Area of downtown Halifax. The feasibility of the DES is predicated on the assumption that connection to the DES will be mandatory within the redevelopment area. To that end, Halifax Regional Municipality has completed amendments to its Charter through

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the Legislature to facilitate this authorization. Work on the Cogswell ATDES continues with stakeholder consultation, and the completion of preliminary and detailed design work in parallel with the Municipality's effort to advance the Cogswell Redevelopment project. Halifax Water intends to pursue a DES as a regulated service subject to Regional Council endorsement of the redevelopment project, a positive business case and the approval of the NSUARB.

Solar Photovoltaic (Solar PV) Systems

An application was submitted to and approved by the "Solar Electricity for Community Buildings Pilot Program" for the deployment of a 75 kW Solar PV system at the Pockwock WSP. Preliminary engineering work will be completed by the end of the 2018/19 fiscal year, with detailed design and construction of the system complete by the fall of 2020 at the latest. This project is expected to generate in excess of 100,000 kWh of clean renewable energy, and reduce annual GHG emissions within the province by over 72 Tonnes CO_{2e}.

5.8 Water Quality Master Plan

Based on research conducted by Dr. Graham Gagnon at Dalhousie University, Halifax Water is now dealing with a new source water challenge related to lake recovery.

From the 1970's onward, governments in Canada and the United States have taken broad efforts to reduce air pollution and specific efforts to reduce the effects of acid rain. Legislation to reduce sulfur oxide emissions and reduce pollution from coal burning has dramatically reduced air pollution. This has resulted in a measurable reduction in sulfate deposition into lakes in Atlantic Canada and elsewhere and a resultant rise in pH.

This is a positive development from an environmental perspective, however, it brings with it challenges from a drinking water treatment perspective. The rise in pH results in greater levels of natural organic matter [NOM] in source waters. NOM is a significant treatment challenge and we have observed that with increasing NOM levels come increased chemical costs and shorter filter run times. Increased pH levels also lead to increased levels of biotic activity in the water sources. Increased biotic activity promote greater occurrence of things like algae, and taste and odour causing compounds such as geosmin.

These two effects of lake recovery have direct impacts on Halifax Water operations. Increased NOM increases treatment cost and may exert demands on treatment plants which are beyond what was contemplated when they were designed.

Source water management and, specifically, lake recovery, will be a focus area for research for the next several years and beyond. The NSERC research chair with Dalhousie University will be a primary program in addressing this issue. Halifax Water needs to quantify the degree to which source water will change in coming years and further, what changes in

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treatment techniques and infrastructure might be required to effectively and efficiently treat source water.

In 2018, Halifax Water was selected by the Water Research Foundation (WRF) for a Tailored Collaboration Project. Given the interest of lake recovery to the entire water sector, particularly utilities in the northeast of North America, WRF will match a US\$100,000 contribution by Halifax Water to study lake recovery and its impact on treatment processes. The international firm, Hazen & Sawyer has been selected to do this work which will deliver a decision support tool to guide utilities in making treatment process decisions in the face of rapidly changing conditions. This will be critical for making plant upgrade decisions at Halifax Water. The WRF research is expected to be completed in late 2019.

5.9 Lead Service Line Replacement Program

In the fall of 2016, the Halifax Water Board approved a new and proactive approach to dealing with lead in drinking water through the replacement of lead service lines [LSL's].

Halifax Water stopped using lead for service lines in the mid-1950's and since the 1970's has been working to remove LSL's. At one time, there may have been as many as 15,000 LSL's on the Halifax peninsula and in central Dartmouth. Today, as a result of these proactive efforts, there are fewer than 2,000 remaining.

LSL's are jointly owned by both the customer and Halifax Water. Halifax Water owns the portion beneath the public right of way and the customer owns the portion on their property. Unfortunately, only a small percentage of customers have replaced the private portion of the lead service. As a result, there may be as many as 10,000 LSL's remaining today on private property, in addition to the 2,000 remaining lines owned by Halifax Water. Research conducted in Halifax with Dalhousie University has confirmed that replacing only a portion of the LSL does not address the problem and in many cases can create worse health outcomes in the short term. Accordingly, it is very important that Halifax Water work with its customers to remove all remaining LSL's

The LSL plan approved by the Halifax Water Board is consistent with North American best practice and requires that Halifax Water partner with its customers to achieve the program goals:

- Complete removal of all LSL's by 2050.
- Development of a reliable LSL inventory.
- Frequent communication with customers,
- Free lead sampling for homes with suspected LSL's,
- Optimized corrosion control treatment.

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In 2017, Halifax Water applied to the Nova Scotia Utility and Review Board to establish a financial assistance program for customers removing LSL's on private property. This program was approved on August 22, 2017 and will be available on an ongoing basis. The program provides for a 25% rebate, up to \$2,500 for homeowners replacing their LSL. Halifax Water is also seeking approval from the NSUARB to provide financing to customers for the balance of the LSL replacement cost.

In the upcoming year, Halifax Water will be working to accelerate the identification and replacement of LSL's. We will also be working to educate customers who have LSL's about the health risks and opportunities for replacement.

Lead service line ownership and responsibility is shared between the water utility and the customer, with the customer owning the portion on private property. Customers face many barriers to replace the portion on private property, with cost being the major impediment, and utilities are restricted from working on private property assets. As a result, approximately only 10% of utility customers have replaced their lead service line when the utility has replaced the public portion as part of a capital project. The inability to address customer barriers to private service line replacement has prevented utilities like Halifax Water from doing more to replace lead service lines.

As a result of its efforts since the 1970's, Halifax Water has replaced all but 2,000 lead services within the public right of way. Replacing all of these services by 2050 is a moderate challenge for Halifax Water, but in order to do so safely, it will be necessary to convince customers to replace the private property portion at the same time. There are many barriers to customers having the desire or ability to replace LSL's and significant program effort will be directed towards working with those customers to improve their understanding of LSL issues and facilitate replacement.

Another significant aspect of this program will be working with the approximately 10,000 customers whose public portions of the LSL have been replaced but for whom the private LSL is still remaining. In order to do this, a cost effective reliable inventory of private LSL's will need to be developed.

In 2018, Halifax Water replaced 75 public and 91 private lead service lines and provided 91 rebates to customers totaling \$87,500. Halifax Water's goal is to increase this to 300 replacements per year and \$300,000 in rebates by integrating lead service line replacement with other infrastructure projects.

In 2018, through our customer connect project, Halifax Water received information on private service line composition from approximately 10,000 homes in suspected lead service line areas. Halifax Water will be using this information in 2019 to begin direct communication with customers who are confirmed to have a lead service line.

In 2019, it is expected that the Guidelines for Canadian Drinking Water Quality, produced by Health Canada will strengthen the guideline for lead in drinking water. Halifax Water is

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preparing to make any required modifications in its program as a result of the expected changes and is preparing for increased communication with customers.

5.10 Safety and Security Program

Safety:

Halifax Water's Occupational Health and Safety Program is based on the Internal Responsibility System [IRS], which is the foundation of the Nova Scotia Occupational Health and Safety Act. The IRS is an internal system that provides for direct responsibility for health and safety for all staff in an organization.

The Safety and Security group of Regulatory Services has principal duties and responsibilities as part of the IRS as follows:

- Assist in formulating and supervising the execution of the utility's Occupational Health and Safety Program, and assist management to fulfill, to the greatest degree possible, its responsibilities for safety.
- Co-ordinate and/or provide safety training to staff in an effort to prevent accidents, minimize losses, increase productivity and efficiency, and ensure compliance with safety legislation and policies.
- Conduct safety audits in the workplace to identify safety hazards and recommend control measures.
- Assist in the development and maintenance of a system of accident investigation, reporting, and follow-up.
- Provide program education for job safety.
- Act as a resource to the Joint Occupational Health and Safety Committee [JOHSC].
- Maintain liaison with federal, provincial, and local safety organizations by taking part in the activities and services of these groups.

A recent external audit identified the need for enhanced corporate understanding and recognition of the Internal Responsibility System [IRS]. With support from Human Resources, mandatory IRS training will be completed in the fourth quarter of 2018/19 for all Employees across the organization.

Halifax Water has established and maintains an Occupational Health and Safety Program in consultation with the Joint Occupational Health and Safety Committees.

This year saw the completion of the Workers Compensation Program, *Preventing Workplace Injuries*, and the results of the final survey indicated an improvement to the safety culture

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within Halifax Water. There were tasks identified to increase safety awareness and an internal “check-in” on items is planned for the fourth quarter of 2018/19.

The team led the review and updating of Halifax Water’s Occupational Health and Safety Manual through the Joint Occupational Health and Safety Committee. The final edits will be completed in the fourth quarter of 2018/19 and updated on the Safety website.

As part of the commitment to the Incident Command System [ICS], Halifax Water continued to provide enhanced training to managers for roles related to General and Command staff under the ICS structure. This was in addition to regular table top exercises and promoting the use of ICS on complicated projects such as the North End Feeder repairs and the management of filter performance at the Pockwock WSP.

The team continues to coordinate filed audits for both Operations and Capital projects. The results from the operational audits are being tracked for noticeable trends that may direct corporate safety talks or changes to Safe Work Practices. Trend graphs are produced, as noted below, for individual depots so they can set targets for improved safety practices.

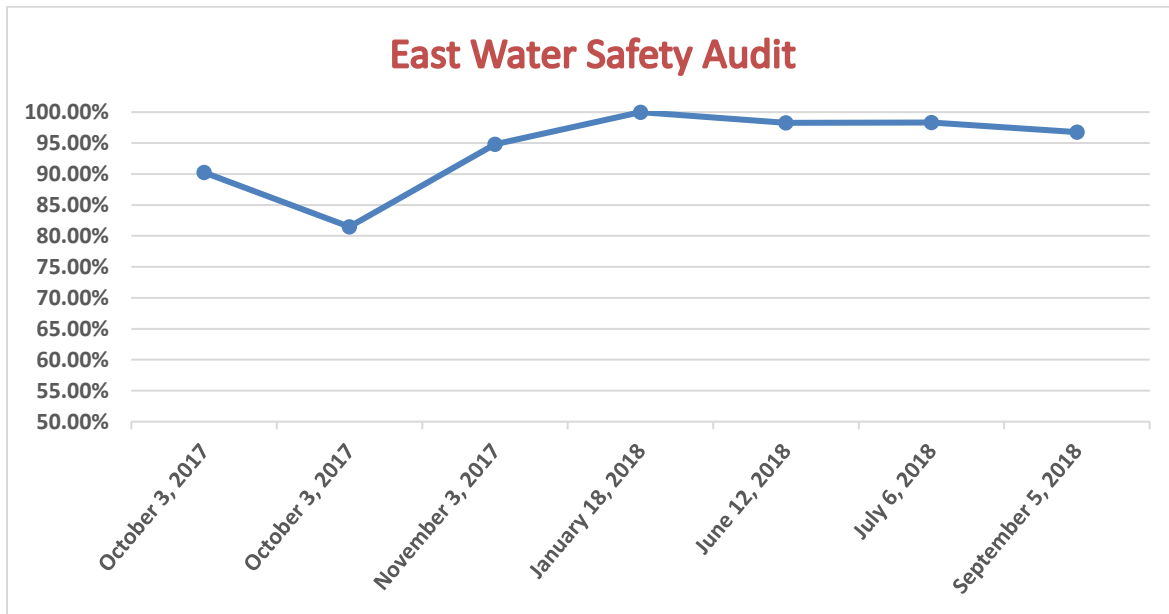


Figure 4 – Typical Water Services Safety Audit Scores

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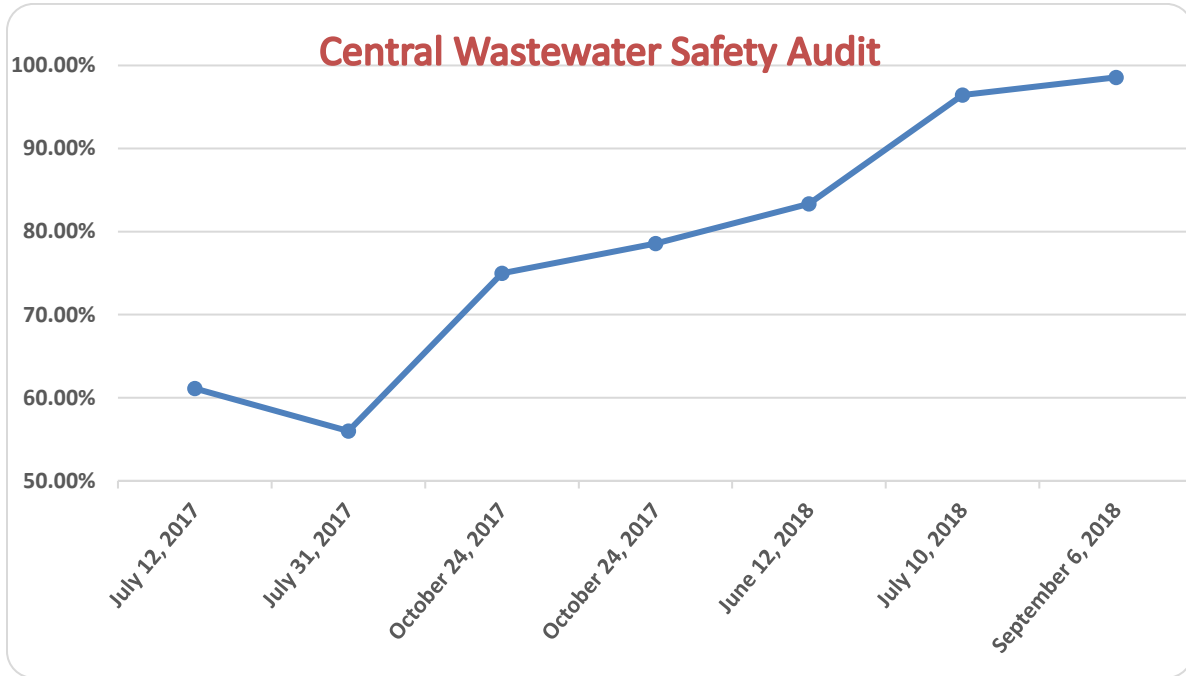


Figure 5 – Typical Wastewater Services Safety Audit Scores

The updates to the **Safety Site** has been completed and the team is seeking feedback from employees on suggested enhancements to the electronic forms.

Security:

Halifax Water’s Security Program is based on enterprise asset protection and is designed to protect three types of assets: people, property, and information. It also considers intangible assets such as the organization’s reputation, relationships, and creditworthiness. The program has been developed to take an all-hazards approach, be it from natural, intentional, or accidental hazards, when reviewing risks to the organization.

Halifax Water uses the three basic elements of a physical security system to protect its assets to ensure it accomplishes its mission.

Protection: The protection element is the physical barrier that delays the determined adversary and the opportunist in accomplishing their goals. Halifax Water uses barriers such as building fabric, fences, doors, door hardware, and containers to protect its assets.

Detection: The detection element indicates and may also verify an actual or attempted overt or covert penetration. Halifax Water uses intrusion alarms, access control systems, CCTV, guards, and patrols to protect its assets.

Response: This element is the reaction to an attempted or actual penetration. Halifax Water uses internal staff and police forces as required, to protect its assets.

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Vulnerability:

In 2016, facility assessments were completed for the Herring Cove and Eastern Passage Wastewater Treatment Facilities in partnership with Public Safety Canada through the Regional Resilience Assessment Program [RRAP] utilizing the Critical Infrastructure Resilience Tool [CIRT]. All major water and wastewater treatment facilities have now been evaluated. The CIRT is a voluntary and non-regulatory vulnerability assessment tool that estimates the resilience and protective posture of critical infrastructure facilities in support of the National Strategy and Action Plan for Critical Infrastructure.

Emergency Management Planning:

Safe and reliable drinking water, sanitation and environmental protection are vital to the sustainability of communities within Halifax Regional Municipality. In recognition of this, Halifax Water maintains an Emergency Management Plan [EMP], as required by the provincial Emergency Management Act.

The purpose of the EMP is to establish an organizational structure and procedures for response to water wastewater, and stormwater incidents. It assigns roles and responsibilities for the activation and implementation of the plan during an emergency, using the Incident Command System [ICS]. The preparation and exercising of an EMP can save lives, reduce risk to public health, enhance system security, minimize property damage, and lessen liability.

5.11 Wastewater Quality Master Plan

Halifax Water has been consistently working towards achieving the level of wastewater treatment as stipulated by NSE permits and Wastewater System Effluent Regulations [WSER]. Since the introduction of the federal WSER, NS Environment has been reviewing and renewing Halifax Water's operating permits with steady increases in compliance and reporting requirements. It is anticipated the wastewater regulations will continue to evolve over the next several years. In light of the changing regulations and emerging needs for stringent treatment levels, Halifax Water is in the process of finalizing the Infrastructure Master Plan (IMP) which is an input to the update of the Integrated Resource Plan. The IMP identifies the needs for servicing customers for the next 30 years. As a part of this process a Compliance Plan is being developed to address the current and future requirements of wastewater regulations in all sewersheds and associated WWTFs. The Compliance Plan will form part of the Integrated Resource Plan and is intended to address all wastewater quality and quantity issues within the service boundaries of Halifax Water.

In 2018/19, Halifax Water actively pursued a research partnership with Dalhousie University for wastewater initiatives. The joint efforts of both parties faced challenges of researcher recruitment which became a barrier in moving this initiative forward. Dalhousie and Halifax Water has come up with an alternative plan to expand the current Industrial

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Research Chair program which is well established at Dalhousie University and has a partnership with Halifax Water for its water quality and treatment initiatives. Halifax Water, in collaboration with Dalhousie University is developing a research proposal to be submitted to NSERC in Spring 2019. At a conceptual level, this plan will focus on current wastewater treatment and collection challenges, the defined challenges of the future, and emerging issues. Some of the questions that the research plan will explore include the following:

- Can effluent standards in the enhanced primary WWTF be met by optimizing chemical dose through real-time monitoring and/or adding coagulant aids?
- What factors control effective UV disinfection following enhanced primary wastewater treatment?
- Can emerging contaminants of concern be effectively removed by enhanced primary WWTF?
- Can Alternative technologies be reasonably incorporated with the existing plants to achieve higher effluent standards?

The research plan being developed is a long term initiative which is flexible in nature to address the emerging needs of Halifax Water and meeting future regulations ensuring compliant wastewater entering receiving waters.

5.12 Asset Management

With the endorsement of the Asset Management Plans (AMPs) by Halifax Water's Executive Team, staff are focusing asset management (AM) efforts on implementing recommendations and continuing to enhance the data that supports the annual AMP updates. Reprioritized initiatives identified in the Asset Management Roadmap Implementation [AMRI] are embedded in the AMP recommendations to support an in-house approach and balance efforts against other resourcing constraints. AM staff are continuing to develop programs to assist and enhance long-term infrastructure planning. Anticipated projects and programs for the Asset Management division are outlined below and within Table 5.

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Table 5: Asset Management and Infrastructure Planning Initiatives [identified in the 2019/20 to 2023/24 Five-Year Business Plan]

Initiative or Program	Implementation Year [2019/20 to 2023/24]				
	2019/20	2020/21	2021/22	2022/23	2023/24
Update Asset Management Plan [Annual]					
AM Implementation Teams (AMITs) Program Rollout					
AM Program Development					
Condition Assessments by Asset Class					
Sewer Inspection Program [Annual]					
IT Strategy Projects					
Infrastructure Master Plan					
Corporate Flow Monitoring Program [Annual]					
Implement Water Hydraulic Model					
Integrated Resource Plan Update					
Climate Change Vulnerability Risk Assessments					



2019/20 will see staff facilitate three Asset Management Implementation Teams (AMITs) for three asset classes as a pilot roll-out. The AMITs will effectively formalize meetings that Operations, Engineering and AM staff hold for reviewing capital priority needs. They will provide a forum for reviewing the AMP, consider the AMP recommendations and develop work plans for the asset class. AM staff will continue to refine the data that informs the AMPs including input of condition assessments,, resolution of data discrepancies in GIS, and improvement of the ‘best available’ information on each asset class.

The Infrastructure Master Plan [The Plan] commenced in November 2017 and will be completed in mid-2019. This is a primary focus for the AM Team moving into 2019/20. The Plan is building on the work completed in the West Region Wastewater Infrastructure Plan [WRWIP] and extending into the east and central regions for wastewater infrastructure and all regions for water infrastructure to create a comprehensive 30-year capital program. The Plan includes implementation of the corporate modelling strategy for the wastewater model and provides standards for both water and wastewater modelling. The Infrastructure Master Plan is a critical input into the Regional Development Charge update, the Integrated Resource Plan update, and potentially the next Halifax Water Rate Application.

Staff will continue with the annual sewer inspection condition assessment program using conventional closed circuit television [CCTV] technology. During 2019 staff plan to explore market interest and capabilities for continuing with zoom inspection technology for gathering condition information of the sewer networks. Efforts to streamline the way staff

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are able to share the outputs from the inspections will continue through 2019/20. The annual flow monitoring program will also continue in 2019/20.

Highlighted initiatives for 2019/20 include:

- Update the Asset Management Plan (annual)
- Pilot AMITs for three asset classes
- Finalize the Infrastructure Master Plan
- Complete the Integrated Resource Plan Update (refer to details in Section 5.13)
- Conduct the Climate Change Vulnerability Assessment Pilot
- Continue the driveway culvert data collection project
- Continue annual flow monitoring and sewer inspection programs
- Build the hydraulic water model
- Asset Management Program Development [subject to direction from Executive Team, the need to balance with ongoing corporate initiatives, and overlap with the IT Strategy] and may cover:
 - expand the current prioritization methodology
 - develop strategic maintenance management program
 - review levels of service
 - enhance capital budget support tools
 - develop an asset management resource library
 - assess the suitability of current data management tools and resource needs
 - continue to improve the way asset management data is shared

5.13 Integrated Resource Plan

Halifax Water completed its first formal Integrated Resource Plan [IRP] in October 2012 with the intention that it would be updated periodically. The IRP was done in collaboration with Telus, the NSUARB's consultant who initially recommended an IRP update in three years. However, the consultant also acknowledged the data limitations encountered during the completion of the IRP and recommended that Halifax Water work to fill the data gaps before the IRP was next updated.

Several important initiatives aimed at filling the data gaps have been underway since the completion of the first IRP. These included:

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- Implementing the Wet Weather Management Program [with inflow and infiltration pilot projects];
- Continuing the implementation of the Asset Management Program [foundational elements from the Roadmap];
- Resolving asset attribute information in GIS, and specific inventory and condition assessment projects];
- Developing plans by asset class;
- Implementing the Corporate Flow Monitoring Program;
- Implementing the Sewer Inspection Program [conventional CCTV and zoom camera inspections];
- Completing the Hydraulic Modelling Assessment and Strategy;
- Completing the West Region Wastewater Infrastructure Plan [WRWIP].

The Infrastructure Master Plan project nearing completion will cover the wastewater infrastructure planning for east and central regions, be inclusive of the program developed in the WRWIP, and include a water infrastructure plan for all regions. The project also includes a climate change assessment and policy component to develop a climate change adaptation plan and a systems optimization plan. Its completion will streamline a number of prior and long-term planning initiatives to facilitate regular Infrastructure Master Plan updates on a five-year cycle for water and wastewater infrastructure.

The IRP update will incorporate findings from work completed or planned to support the drivers of regulatory compliance, asset renewal, and growth.

The goal is to develop an updated IRP that recalibrates the \$2.6 billion long-term investment identified in the first IRP [2012], and positions the utility for future updating on a five-year cycle.

Halifax Water has engaged a consultant to undertake the important task of working with utility staff to build on the key initiatives already underway to provide a revised IRP by mid-2019.

5.14 Enterprise Risk Management

In accordance with best practice and sound governance, the Halifax Water Board approved a framework for Enterprise Risk Management [ERM] in 2018. With the framework in place, management has taken next steps to develop and implement a formal ERM System to ensure alignment with corporate priorities and strategy. An internal project team has been established and an external consultant hired to support the initiative with the objective to deliver a system by Spring 2019, complete with a risk register for ongoing monitoring, prioritization and mitigation of risks.

5.15 Regional Development Charge

The Regional Development Charge was approved in 2014 to collect funds to design and construct oversized of Regional Infrastructure to support growth. The Asset Management team is project managing the completion of the infrastructure plans for East and Central regions. These, in conjunction with the outcomes from the West region plan (2017), will be used to complete the 5 year update to the Regional Development Charge. Stakeholder consultation will continue this year, with an Application being made to the NSUARB in the summer of 2019.

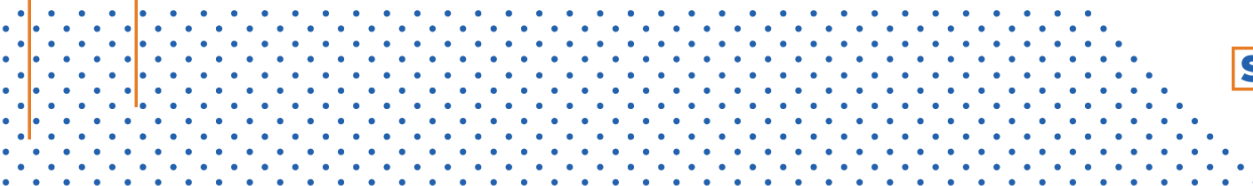
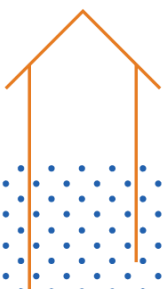
5.16 Talent Management

In 2018/19 Halifax Water engaged an external consultant and many staff to participate in a review of Halifax Water's succession planning, and processes to develop staff. A report on Talent Management was received summer of 2018, and in 2019/20 Halifax Water will be implementing some of the recommendations from the report. Some examples include new performance appraisal processes for non-union staff, and investment in an on-line training platform that will be rolled out in 2019/20. Employees that supervise staff will have access to on-line training and tools such as discussion guides and tips for dealing with various workplace situations. All employees should see some benefit from these new tools as there are short instructional videos and discussion guides that can be used in staff meetings and tool box talks.



Appendix A

Mission, Vision & Values



**STRAIGHT from
the SOURCE**



Our Mission:

*“To provide world class services
for our customers and our environment”*

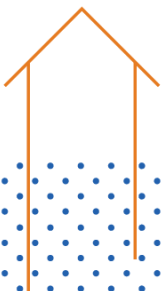
Our Vision:

- *We will provide our customers with high quality water, wastewater, and stormwater services.*
- *Through adoption of best practices, we will place the highest value on public health, customer service, fiscal responsibility, workplace safety and security, asset management, regulatory compliance, and stewardship of the environment.*
- *We will fully engage employees through teamwork, innovation, and professional development.*

Our Values:

Halifax Water promotes a culture that:

- *Engages employees, partners and stakeholders in achieving success;*
- *Encourages openness and transparency;*
- *Demonstrates individual and corporate accountability for results;*
- *Fosters innovation and progressive thinking;*
- *Respects diverse ideas, opinions and people;*
- *Is committed to service excellence; and*
- *Nurtures leadership at all levels.*

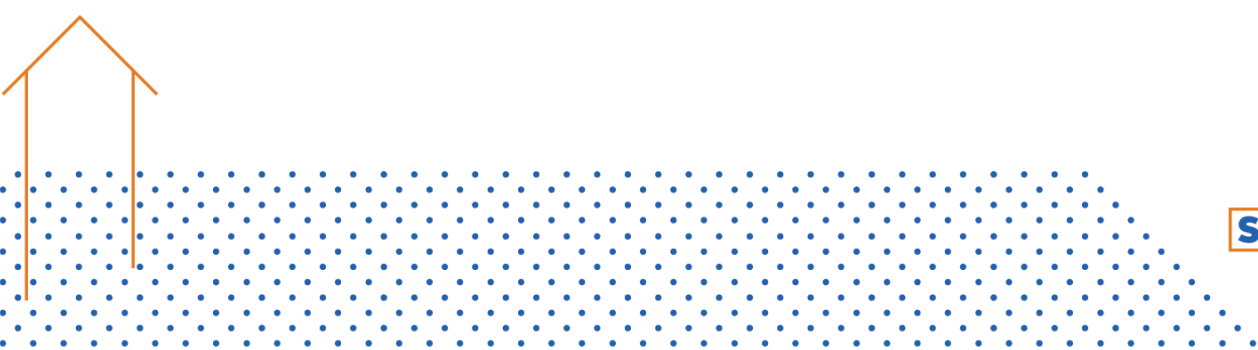


**STRAIGHT from
the SOURCE**



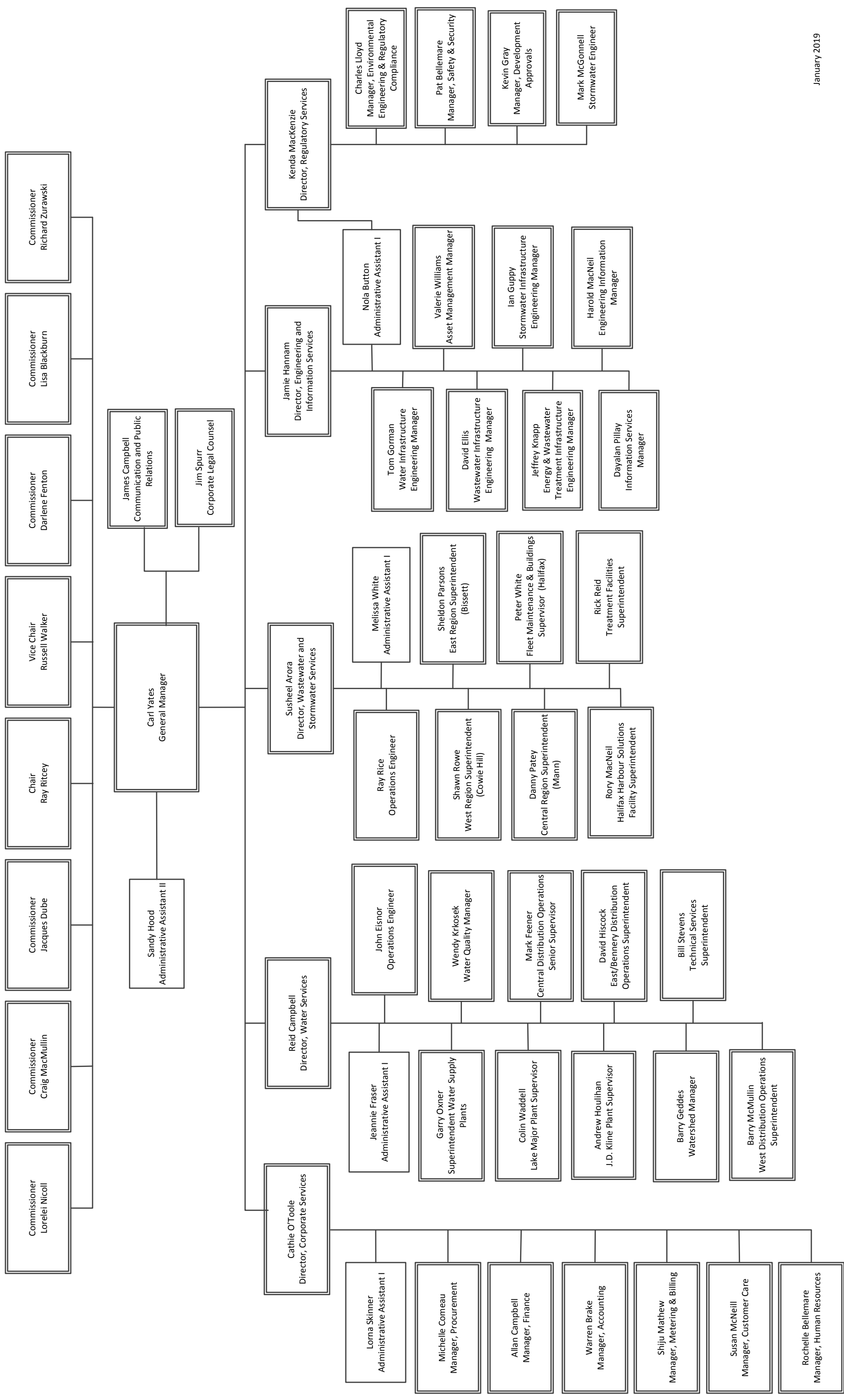
Appendix B

Organizational Chart



**STRAIGHT from
the SOURCE**

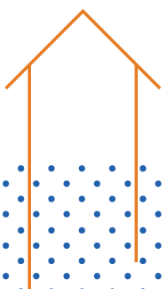
HALIFAX WATER ORGANIZATIONAL STRUCTURE





Appendix C

2019/20 Capital Budget



**STRAIGHT from
the SOURCE**

HALIFAX WATER

Capital Budget 2019/20

Summary

Asset Category	Project Costs
----------------	---------------

<i>Water - Land -- T O T A L</i>	\$525,000
<i>Water - Transmission -- T O T A L</i>	\$8,640,000
<i>Water - Distribution -- T O T A L</i>	\$5,690,000
<i>Water - Structures -- T O T A L</i>	\$441,000
<i>Water - Treatment Facilities -- T O T A L</i>	\$7,211,000
<i>Water - Energy -- T O T A L</i>	\$540,000
<i>Water - Security -- T O T A L</i>	\$50,000
<i>Water - Equipment -- T O T A L</i>	\$50,000
<i>Water - Corporate Projects - T O T A L</i>	\$9,696,000
TOTAL - Water	\$32,843,000

<i>Wastewater - Trunk Sewers -- T O T A L</i>	\$755,000
<i>Wastewater - Collection System -- T O T A L</i>	\$16,516,000
<i>Wastewater - Forcemains -- T O T A L</i>	\$575,000
<i>Wastewater Structures -- T O T A L</i>	\$1,475,000
<i>Wastewater - Treatment Facility -- T O T A L</i>	\$3,245,000
<i>Wastewater - Energy -- T O T A L</i>	\$425,000
<i>Wastewater - Security -- T O T A L</i>	\$200,000
<i>Wastewater - Equipment -- T O T A L</i>	\$145,000
<i>Wastewater - Corporate Projects -- T O T A L</i>	\$10,642,800
TOTAL - Wastewater	\$33,978,800

HALIFAX WATER

Capital Budget 2019/20

Summary

Asset Category	Project Costs
----------------	---------------

<i>Stormwater - Pipes -- T O T A L</i>	\$2,447,000
<i>Stormwater - Culverts -- T O T A L</i>	\$1,766,000
<i>Stormwater - Structures -- T O T A L</i>	\$4,225,000
<i>Stormwater - Corporate Projects -- T O T A L</i>	\$2,088,200
TOTAL - Stormwater	\$10,526,200

GRANDTOTAL	\$77,348,000
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HALIFAX WATER

Capital Budget 2019/20

Water

Project Number	Project Name	Project Cost
<u>Water - Land</u>		
3.033	Watershed Land Acquisition	\$100,000
3.383	Bennery Lake Watershed Land	\$350,000
3.497	Lake Major Watershed - Glasgow Lands	\$75,000
<i>Water - Land -- T O T A L</i>		\$525,000
<u>Water - Transmission</u>		
3.470	Critical Valve Replacements 2019	\$225,000
3.291	Port Wallace Transmission Main - Caledonia Section	\$120,000
3.389	Halifax Peninsula Transmission Main Project	\$400,000
3.399	Cogswell Interchange - Water Transmission Main Realignment	\$600,000
3.019	Lucasville Road Transmission Main - Phase 1	\$7,150,000
3.045	Bedford West CCC - Various Phases	\$15,000
3.261	Lakeside Timberlea CCC	\$5,000
3.232	MacIntosh Estates Phase 1 Oversizing	\$125,000
<i>Water - Transmission -- T O T A L</i>		\$8,640,000
<u>Water - Distribution</u>		
3.022	Water Distribution - Main Renewal Program	\$4,330,000
3.067	~ Valves Renewals	\$125,000
3.068	~ Hydrants Renewals	\$75,000
3.069	~ Service Lines Renewals	\$100,000
3.390	Lead Service Line Replacement Program	\$1,000,000
3.294	Automated Flushing Program	\$20,000
3.334	Coburg Road Bridge Watermain Replacement	\$40,000
<i>Water - Distribution -- T O T A L</i>		\$5,690,000

HALIFAX WATER

Capital Budget 2019/20

Water

Project Number	Project Name	Project Cost
----------------	--------------	--------------

Water - Structures

3.391	Lake Major Dam Monitoring Program	\$120,000
3.490	Robie 2 Emergency Pump Meter Installation	\$21,000
3.414	Dam Safety Review	\$300,000

Water - Structures -- T O T A L

\$441,000

Water - Treatment Facilities

J D Kline Water Supply Plant:

3.452	JD Kline WSP - Process Upgrades	\$250,000
3.499	JD Kline WSP - Low Lift Station Crane Renewal	\$75,000
3.493	JD Kline WSP - Pilot Plant Upgrades	\$200,000
3.415	JD Kline WSP - Raw Water Intake Traveling Screen Replacement Program	\$245,000
3.478	JD Kline WSP - Pre-mix Area Mixers Upgrade	\$90,000
3.428	JD Kline WSP - Caustic Tank Liner Replacements	\$16,000
3.353	JD Kline WSP - Effluent Valve Actuator Replacement Program	\$200,000
3.242	JD Kline WSP - Replace CO2 Feeders	\$590,000
3.338	J D Kline WSP - Upgrades to the Process Wastewater Lagoons	\$150,000
3.354	J D Kline WSP - Upgrade the PLC	\$420,000
3.341	JD Kline WSP - Roof Replacement	\$270,000
3.461	J D Kline WSP - New Lime Blower System	\$35,000
3.462	JD Kline WSP - New Alum Chemical Supply	\$15,000
3.466	JD Kline WSP - Purchase New Microscope	\$17,000

HALIFAX WATER

Capital Budget 2019/20

Water

Project Number	Project Name	Project Cost
3.465	JD Kline WSP - Low Lift Pump #3	\$1,000,000
3.472	JD Kline WSP - Replace Flocculation Tank Valve	\$35,000
3.474	JD Kline WSP - Low Lift Station Roof Fan Shroud Replacement	\$21,000
3.480	JD Kline WSP - Raw Water Pump Station Window/Wall/Building Envelope	\$50,000
3.481	JD Kline WSP - Building Envelope Upgrades	\$100,000
3.483	JD Kline WSP - Raw Water Pump Station Electrical Room Ventilation	\$50,000
3.484	JD Kline WSP - Back-up Power Supply Study	\$50,000
3.351	JD Kline WSP - Replace Westinghouse Electrical Panels	\$8,000
Lake Major Water Supply Plant:		
3.159	Lake Major WSP - Replace Contactors in the MCC	\$34,000
3.162	Lake Major WSP - Butterfly valve replacement program	\$200,000
3.476	Lake Major WSP - CO2 System Replacement - Construction	\$215,000
3.485	Lake Major WSP - Lab Relocation	\$235,000
3.304	Lake Major WSP - Dry Polymer Feed System	\$305,000
3.161	Lake Major WSP - Replace the Lime Feed and Delivery System	\$120,000
3.491	Lake Major WSP - Overall Process and Design Study	\$350,000
3.495	Lake Major WSP - Purchase Spectrophotometer	\$15,000
3.496	Lake Major WSP - Purchase Turbidimeter	\$18,000
3.195	Lake Major WSP - Filtration System Replacement	\$280,000
3.278	Lake Major WSP - Clarifier Repair	\$285,000
Bennery Lake Water Supply Plant:		
3.477	Aerotech Booster Station Capital Upgrades	\$60,000
3.488	Bennery Lake WSP - Surge Anticipator Valves Replacement	\$20,000
3.486	Bennery Lake WSP - Access Road Upgrade	\$100,000
3.487	Bennery Lake WSP - Filter Influent Valves	\$64,000
3.418	Bennery Lake WSP - Sludge Valve Replacement Program	\$7,000
Non-Urban Core WSP		
3.459	Miller Lake Small System - Public Main Extension - Miller Lake Road	\$540,000
3.451	Silversands WSP - Electrical/Architectural Upgrades	\$150,000

HALIFAX WATER

Capital Budget 2019/20

Water

Project Number	Project Name	Project Cost
3.211	Chlorine Analyzer Replacement Program	\$16,000
3.455	Reservoir Mixing and Residuals Management Upgrade Program	\$150,000
3.467	Purchase and Install TOC Analyzers WSP Facilities	\$90,000
3.469	Purchase and Install Water Quality Sonde Equipment	\$70,000
<i>Water - Treatment Facilities -- T O T A L</i>		\$7,211,000
<u>Water - Energy</u>		
3.437	Lake Major WSP - Process Area HVAC Upgrades	\$375,000
3.254	Bennery Lake WSP - MCC Replacement	\$150,000
3.479	Bennery Lake WSP - Tank Insulation Repairs	\$15,000
<i>Water - Energy -- T O T A L</i>		\$540,000
<u>Water - Security</u>		
4.009	Security Upgrade Program	\$50,000
<i>Water - Security -- T O T A L</i>		\$50,000
<u>Water - Equipment</u>		
3.101	Miscellaneous Equipment Replacement	\$50,000
<i>Water - Equipment -- T O T A L</i>		\$50,000
<i>Water - Corporate Projects - T O T A L</i>		\$9,696,000
<i>GRAND TOTAL - WATER</i>		<u>\$32,843,000</u>

HALIFAX WATER

Capital Budget 2019/20

Wastewater

Project Number	Project Name	Project Cost
<u>Wastewater - Trunk Sewers</u>		
2.697	Sackville Trunk Sewer - Condition Assessment	\$155,000
2.584	Fairview Cove Trunk Sewer	\$600,000
<i>Wastewater - Trunk Sewers -- T O T A L</i>		\$755,000
<u>Wastewater - Collection System</u>		
2.052	Integrated Wastewater Projects - Program	\$1,700,000
2.168	Wastewater System - Trenchless Rehabilitation Program	\$2,900,000
2.728	Main Street Sewer Main Replacement	\$100,000
2.692	Cogswell Redevelopment - Sewer Relocation	\$170,000
2.659	Fairview Clayton Park Bridgeview I/I Reduction	\$2,500,000
2.013	Wanda Lane Sanitary Sewer Replacement	\$1,050,000
2.746	Sewer Relocation at South Street CN Bridge	\$50,000
2.357	Manhole Renewals WW	\$20,000
2.358	Lateral Replacements WW (non-tree roots)	\$1,685,000
2.563	Lateral Replacements WW (tree roots)	\$526,000
2.223	Wet Weather Management Program	\$350,000
2.074	Bedford West Collection System CCC	\$100,000
- WRWIP PROJECTS		
2.675	Bayers Rd Phase 1 - Sewer Separation	\$1,375,000
2.677	Romans - Federal Avenues - Sewer Separation	\$2,600,000
2.68	Bayers Rd Phase 2 - Sewer Separation	\$1,390,000
<i>Wastewater - Collection System -- T O T A L</i>		\$16,516,000
<u>Wastewater - Forcemains</u>		
2.727	Beaver Crescent PS - FM Replacement	\$500,000
2.748	Caldwell Road ARV/MH Replacement	\$75,000
<i>Wastewater - Forcemains -- T O T A L</i>		\$575,000

HALIFAX WATER

Capital Budget 2019/20

Wastewater

Project Number	Project Name	Project Cost
<u>Wastewater - Structures</u>		
2.42	Emergency Pumping Station Pump replacements	\$250,000
2.442	Wastewater Pumping Station Component Replacement Program - West Region	\$200,000
2.443	Wastewater Pumping Station Component Replacement Program - East Region	\$200,000
2.444	Wastewater Pumping Station Component Replacement Program - Central Region	\$250,000
2.698	Fish Hatchery FM - ARV Chamber Water Proofing	\$25,000
2.745	Pump Station Elimination - Concept Design	\$25,000
2.005	Autoport Pleasant Street PS Replacement	\$50,000
2.696	Upper Water Street CSO Replacement	\$150,000
2.088	Russell Lake PS Upgrade	\$25,000
2.093	Windmill Road PS Replacement	\$100,000
2.665	CSO Upgrade Program	\$125,000
2.74	Duffus PS CSO - Modification	\$50,000
2.089	Fairfield Holding Tank Rehabilitation	\$25,000
<i>Wastewater Structures -- T O T A L</i>		\$1,475,000
<u>Wastewater - Treatment Facility</u>		
2.056	Plant Optimization Audit Program	\$125,000
2.522	Emergency Wastewater Treatment Facility equipment replacements	\$400,000
2.564	Carbon Media Replacement	\$50,000
2.699	HSPs - Outfall Inspection Program	\$20,000
2.701	HHSP - OCS Wet Scrubber Chlorine Analyzers	\$125,000
Halifax Wastewater Treatment Facility:		
2.532	Duct Work Replacement	\$50,000
2.653	New Raw Water Pumps	\$350,000
2.705	AHU Coil Replacement	\$30,000
2.702	Grit Pump Replacement	\$75,000
Dartmouth Wastewater Treatment Facility:		
2.502	Duct Work Replacement	\$25,000
2.707	Densadeg Flow Meters	\$125,000

HALIFAX WATER

Capital Budget 2019/20

Wastewater

Project Number	Project Name	Project Cost
2.501	Coagulant Dosing Pump Replacements	\$40,000
	Herring Cove Wastewater Treatment Facility:	
2.639	Duct Work Replacement Program	\$25,000
	Mill Cove Wastewater Treatment Facility:	
2.642	South Secondary Splitter Box Rehabilitation	\$30,000
2.64	Process Upgrades - Preliminary & Detailed Design	\$150,000
2.708	Digester Mixers - Failure Analysis	\$20,000
2.709	Lining of Supernatant Pump Station Croc	\$50,000
2.71	Replace Oxygen Analyzer	\$75,000
2.711	South Secondary Clarifier - Recoat/Replace Mechanisms	\$100,000
2.713	New Lab Cabinets and Counter Tops	\$60,000
	Eastern Passage Wastewater Treatment Facility:	
2.468	Process Upgrade Program	\$50,000
2.714	Rebuild Centrifuge 802	\$50,000
2.715	RAS Pumps - Spare Parts	\$40,000
2.716	Primary Sludge Pumps - Spare Parts	\$15,000
2.717	Atlas Copco Blowers - Spare VFD	\$20,000
2.718	Drum Thickener Overhaul - Spare Parts	\$15,000
2.719	Yard Lighting	\$35,000
2.72	Outfall Inspection and Warning Signage	\$15,000
	Aerotech Wastewater Treatment Facility:	
2.747	Upgrade and Expansion Project Extra Costs	\$500,000
2.667	Asset Renewal Program	\$100,000
	Timberlea Wastewater Treatment Facility:	
2.509	Asset Renewal Program	\$50,000
	Community Wastewater Treatment Facilities:	
2.723	Springfield Lake and Noth Preston - Driveway Replacement	\$15,000
2.741	Easement for Sewer and Access	\$15,000
	Biosolids Processing Facility:	
2.568	Management Plan	\$150,000
2.731	Building Cleaning and Corrosion Protection	\$250,000
Wastewater - Treatment Facility -- T O T A L		\$3,245,000

HALIFAX WATER

Capital Budget 2019/20

Wastewater

Project Number	Project Name	Project Cost
<u>Wastewater - Energy</u>		
2.491	Pump Station HVAC Retro-Commissioning Program	\$100,000
2.65	HHSP - BAS + HVAC Recommissioning	\$50,000
2.651	NSPI Meter Relocations	\$25,000
2.554	Wastewater Pumping Station Performance Testing	\$250,000
<i>Wastewater - Energy -- T O T A L</i>		\$425,000
<u>Wastewater - Security</u>		
4.008	Security Upgrade Program	\$200,000
<i>Wastewater - Security -- T O T A L</i>		\$200,000
<u>Wastewater - Equipment</u>		
2.161	I&I Reduction (SIR) Program Flow Meters and Related Equipment	\$25,000
2.451	Miscellaneous Equipment Replacement	\$120,000
<i>Wastewater - Equipment -- T O T A L</i>		\$145,000
<i>Wastewater - Corporate Projects -- T O T A L</i>		\$10,642,800
<i>GRAND TOTAL - WASTEWATER</i>		\$33,978,800

HALIFAX WATER

Capital Budget 2019/20

Stormwater

Project Number	Project Name	Project Cost
<u>Stormwater - Pipes</u>		
1.188	Cogswell Redevelopment - SW Sewer Relocation	\$300,000
1.038	Integrated Stormwater Projects - Program	\$1,200,000
1.198	Wanda Lane Deep Storm Sewer	\$205,000
1.218	Wanda Lane Storm System Upgrade	\$210,000
1.219	Lakecrest Drive CMP Replacement	\$75,000
1.22	Everette Street at Bonnie Brae Drive Drainage Upgrade	\$75,000
1.222	Celtic Drive Storm Sewer Renewal	\$120,000
1.102	Manhole Renewals SW	\$15,000
1.103	Catchbasin Renewals SW	\$60,000
1.135	Lateral Replacements SW	\$12,000
1.019	Drainage Remediation Program Surveys/Studies	\$25,000
1.204	National Disaster Mitigation Program	\$50,000
1.201	Stormwater Pipe Condition Inspections (CSP)	\$100,000
<i>Stormwater - Pipes -- T O T A L</i>		\$2,447,000
<u>Stormwater - Culverts/Ditches</u>		
1.104	Driveway Culvert Replacements	\$812,000
1.187	Stormwater Survey and Studies Program	\$60,000
Street Specific Culvert Replacements:		
1.214	BUNDY LANE, near civic 79	\$38,000
1.215	PARKWAY DRIVE and ATHOLEA DRIVE	\$38,000
1.216	FREDERICK DRIVE at DYKE ROAD	\$38,000
1.217	MILLERS ROAD, near civic 1	\$38,000
1.213	HIGHWAY 2, near civic 1380	\$170,000
1.221	MURRAY ROAD at CALDWELL ROAD	\$50,000
1.208	YANKEETOWN ROAD, near civic 16	\$170,000
1.125	CORONET AVENUE DRIVEWAY CULVERT REPLACEMENT PROJECT	\$200,000
1.209	LUCASVILLE ROAD, Sta. 0+910, near civic 1155	\$38,000
1.21	LUCASVILLE ROAD, Sta. 1+595, at Third St	\$38,000
1.211	LUCASVILLE ROAD, Sta. 2+695, near civic 758	\$38,000
1.212	LUCASVILLE ROAD, Sta. 2+750, near civic 749 and 743	\$38,000
<i>Stormwater - Culverts/Ditches -- T O T A L</i>		\$1,766,000

HALIFAX WATER

Capital Budget 2019/20

Stormwater

Project Number	Project Name	Project Cost
<u>Stormwater - Structures</u>		
1.202	Ellenvale Run Retaining Wall System - Phase 2	\$2,220,000
1.203	Ellenvale Run Retaining Wall System - Phase 3 (Wanda Lane)	\$1,830,000
1.006	Clement St Berm	\$175,000
<i>Stormwater - Structures -- T O T A L</i>		\$4,225,000
<i>Stormwater - Corporate Projects -- T O T A L</i>		\$2,088,200
<i>GRAND TOTAL - STORMWATER</i>		<u>\$10,526,200</u>

1.000

~ Denotes Blanket approval

* Denotes Project with Funding Split between Services

HALIFAX WATER

Capital Budget 2019/20

Corporate Projects

Project Number	Project Name	Project Cost
<u>Corporate - Information Technology</u>		
4.011	Desktop Computer Replacement Program	\$290,000
4.012	IT Server Hosting	\$240,000
4.013	Document/Content Management	\$100,000
4.083	Computerized Maintenance Management System (CMMS) Enhancements	\$1,000,000
4.074	Asset Registry	\$200,000
4.086	IT Foundations	\$200,000
4.089	Telephony	\$90,000
4.091	Permit Approvals	\$770,000
1.161	Stormwater Billing Support	\$225,000
4.107	Customer Portal	\$700,000
4.097	Analytics Decision Support System	\$225,000
4.098	Regulatory Reporting	\$400,000
4.121	New Payroll System	\$600,000
4.102	Approval Forms Framework	\$600,000
4.101	Mobile Devices and Applications	\$200,000
4.1	SAP S4 Hana Upgrade	\$2,000,000
4.125	Water/Wastewater Data Quality Software Replacement	\$600,000
4.127	Migrate to Office 365	\$250,000
4.094	Customer Transactional Site	\$600,000
4.123	Data Governance	\$150,000
<i>Corporate - Information Technology -- T O T A L</i>		\$9,440,000
<u>Corporate - GIS</u>		
4.115	GIS Data Build - Services (ICI)	\$250,000
4.010	Sewer Service Entry	\$550,000
4.116	GIS Data Project	\$250,000
4.038	GIS Hardware/Software Program	\$100,000
4.039	GIS Application Support Program	\$150,000
4.059	Water Database Model	\$50,000
4.118	Engineering Drawing Database	\$250,000
<i>Corporate - GIS -- T O T A L</i>		\$1,600,000

HALIFAX WATER

Capital Budget 2019/20

Corporate Projects

Project Number	Project Name	Project Cost
<u>Corporate - Asset Management</u>		
2.523	Wastewater Sewer Condition Assessment	\$90,000
1.156	Storm Sewer Condition Assessment	\$60,000
2.043	Corporate Flow Monitoring Program	\$1,760,000
3.398	Hydraulic Water Model Build	\$190,000
4.113	Vulnerability to Climate Change Risk Assessment-Asset Class Pilot	\$100,000
<i>Corporate - Asset Management -- T O T A L</i>		\$2,200,000
<u>Corporate - Facility</u>		
2.176	East/Central Regional Operational Facility	\$4,000,000
4.077	Building Capital Improvements	\$100,000
<i>Corporate - Facility -- T O T A L</i>		\$4,100,000
<u>Corporate - SCADA & Other Equipment</u>		
4.093	GPS Units - Replacement	\$67,000
4.004	SCADA Control System Enhancements	\$100,000
4.080	Large and New Customer Meters	\$460,000
4.430	Meter Deployment	\$2,600,000
<i>Corporate - SCADA & Other Equipment -- T O T A L</i>		\$3,227,000
<u>Corporate - Fleet</u>		
4.006	Fleet Upgrade Program Stormwater	\$295,000
4.006	Fleet Upgrade Program Wastewater	\$1,180,000
4.007	Fleet Upgrade Program Water	\$385,000
<i>Corporate - Fleet -- T O T A L</i>		\$1,860,000
<i>GRAND TOTAL - Corporate Projects</i>		<u>\$22,427,000</u>

HALIFAX WATER

Capital Budget 2019/20

Corporate Projects

Project Number	Project Name	Project Cost
----------------	--------------	--------------

ALLOCATION BREAKDOWN:

Water - Corporate Projects - T O T A L	\$9,696,000
Wastewater - Corporate Projects -- T O T A L	\$10,642,800
Stormwater - Corporate Projects -- T O T A L	\$2,088,200

GRAND TOTAL - Corporate Projects

\$22,427,000

Note: All corporate projects are allocated as follows:

50% Water

40% Wastewater

10% Stormwater

(unless otherwise noted)

HALIFAX WATER

Capital Budget 2019/20

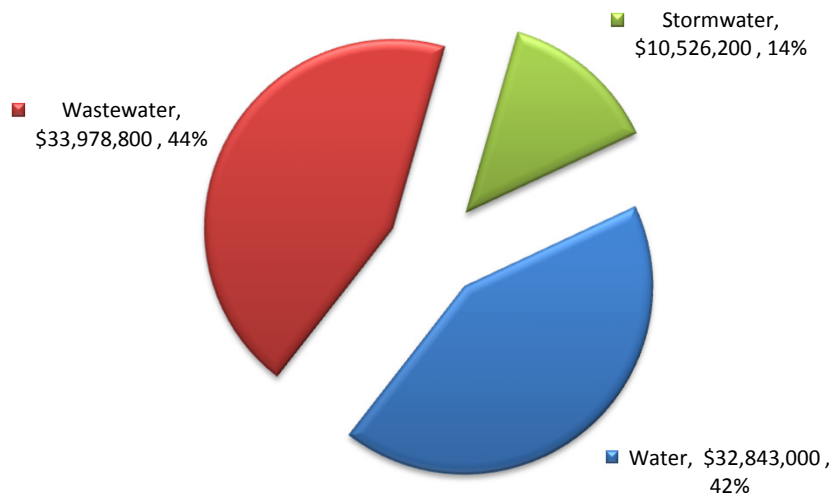
Summary of Routine Capital Expenditures included within Capital Budget

Project Number	Project Name	Project Cost
3.067	Valves Renewals	\$125,000
3.068	Hydrants Renewals	\$75,000
3.069	Service Lines Renewals	\$100,000
3.390	Lead Service Line Replacement Program	\$1,000,000
3.101	Miscellaneous Equipment Replacement (W)	\$50,000
4.007	Fleet Upgrade Program Water	\$385,000
2.357	Manhole Renewals WW	\$20,000
2.358	Lateral Replacements WW (non-tree roots)	\$1,685,000
2.563	Lateral Replacements WW (tree roots)	\$526,000
2.161	I&I Reduction (SIR) Program Flow Meters and Related Equipment	\$25,000
2.451	Miscellaneous Equipment Replacement (WW)	\$120,000
4.006	Fleet Upgrade Program Wastewater	\$1,180,000
1.102	Manhole Renewals SW	\$15,000
1.103	Catchbasin Renewals SW	\$60,000
1.135	Lateral Replacements SW	\$12,000
4.006	Fleet Upgrade Program Stormwater	\$295,000
4.011	Desktop Computer Replacement Program	\$290,000
4.093	GPS Units - Replacement	\$67,000
4.080	Large and New Customer Meters	\$460,000
4.430	Meter Deployment	\$2,600,000
GRAND TOTAL - Routine Capital Projects		\$9,090,000

Summary
Water
Wastewater
Stormwater

Values
\$ 32,843,000
\$ 33,978,800
\$ 10,526,200

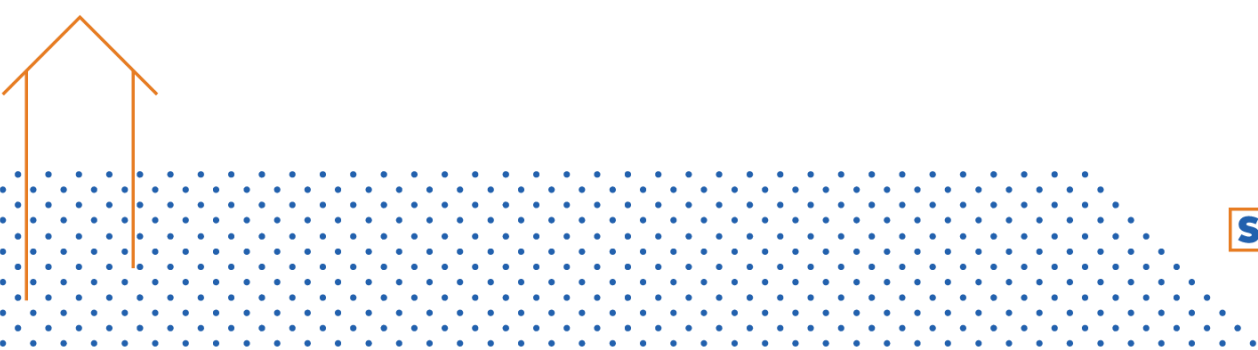
2019/2020 Capital Budget by Asset Class - All Divisions





Appendix D

2019/20 Operating Budget



**STRAIGHT from
the SOURCE**

HALIFAX WATER
CONSOLIDATED SUMMARY OF ESTIMATED REVENUES & EXPENDITURES
PROPOSED OPERATING BUDGET
APRIL 1, 2019 to MARCH 31, 2020
(in thousands)

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1 18 MAR 31 19	PROPOSED BUDGET APR 1/19 MAR 31/20
OPERATING REVENUES	\$138,145	\$135,182	\$138,727
OPERATING EXPENDITURES	<u>\$104,452</u>	<u>\$111,710</u>	<u>\$120,756</u>
OPERATING PROFIT	<u>\$33,694</u>	<u>\$23,472</u>	<u>\$17,971</u>
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$694	\$480	\$816
PNS FUNDING HHSP DEBT	\$2,000	\$0	\$0
MISCELLANEOUS	<u>\$1,793</u>	<u>\$526</u>	<u>\$553</u>
	<u>\$4,486</u>	<u>\$1,006</u>	<u>\$1,369</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$7,884	\$8,560	\$8,181
LONG TERM DEBT PRINCIPAL	\$21,247	\$22,601	\$19,822
AMORTIZATION DEBT DISCOUNT	\$202	\$245	\$202
DIVIDEND/GRANT IN LIEU OF TAXES	\$4,774	\$5,142	\$5,147
MISCELLANEOUS	<u>\$269</u>	<u>\$16</u>	<u>\$22</u>
	<u>\$34,376</u>	<u>\$36,564</u>	<u>\$33,374</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES	<u>\$3,804</u>	<u>(\$12,086)</u>	<u>(\$14,034)</u>
<i>Adjustments:</i>			
<i>Pension accrual</i>	<u>\$5,015</u>	<u>\$2,940</u>	<u>\$5,668</u>
Net Profit (Loss) on a Cash Basis	<u>\$8,819</u>	<u>(\$9,146)</u>	<u>(\$8,366)</u>

* 2018/19 Operating Budget approved by the Halifax Water Board of Directors, January 25, 2018.

HALIFAX WATER
ESTIMATED REVENUES AND EXPENDITURES - WATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2019 to MARCH 31, 2020
(in thousands)

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1/18 MAR 31/19	PROPOSED BUDGET APR 1/19 MAR 31/20
REVENUES			
METERED SALES	\$47,220	\$46,141	\$47,744
FIRE PROTECTION	\$7,074	\$7,074	\$7,074
PRIVATE FIRE PROTECTION SERVICES	\$856	\$860	\$873
BULK WATER STATIONS	\$304	\$329	\$292
CUSTOMER LATE PAY./COLLECTION FEES	\$220	\$233	\$223
MISCELLANEOUS	\$176	\$166	\$179
	<u>\$55,850</u>	<u>\$54,803</u>	<u>\$56,387</u>
EXPENDITURES			
WATER SUPPLY & TREATMENT	\$7,517	\$8,750	\$9,597
TRANSMISSION & DISTRIBUTION	\$8,591	\$10,323	\$11,127
SMALL SYSTEMS (incl. Contract Systems)	\$1,128	\$1,194	\$1,237
TECHNICAL SERVICES (SCADA)	\$819	\$965	\$1,037
ENGINEERING & INFORMATION SERVICES	\$3,289	\$3,681	\$3,901
REGULATORY SERVICES	\$1,057	\$997	\$1,142
CUSTOMER SERVICE	\$2,348	\$2,813	\$2,918
ADMINISTRATION & PENSION	\$6,910	\$5,538	\$7,243
DEPRECIATION	\$8,550	\$9,229	\$9,955
	<u>\$40,210</u>	<u>\$43,489</u>	<u>\$48,159</u>
OPERATING PROFIT	<u>\$15,640</u>	<u>\$11,314</u>	<u>\$8,229</u>
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$313	\$216	\$367
MISCELLANEOUS	\$485	\$428	\$431
	<u>\$798</u>	<u>\$644</u>	<u>\$798</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$2,131	\$2,363	\$2,238
LONG TERM DEBT PRINCIPAL	\$8,247	\$8,227	\$5,165
AMORTIZATION DEBT DISCOUNT	\$94	\$108	\$67
DIVIDEND/GRANT IN LIEU OF TAXES	\$4,774	\$5,142	\$5,147
MISCELLANEOUS	\$149	\$11	\$12
	<u>\$15,395</u>	<u>\$15,850</u>	<u>\$12,630</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES	<u>\$1,043</u>	<u>(\$3,892)</u>	<u>(\$3,603)</u>

* 2018/19 Operating Budget approved by the Halifax Water Board of Directors, January 25, 2018.

HALIFAX WATER
ESTIMATED REVENUES AND EXPENDITURES - WASTEWATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2019 to MARCH 31, 2020
(in thousands)

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1/18 MAR 31/19	PROPOSED BUDGET APR 1/19 MAR 31/20
REVENUES			
METERED SALES	\$69,994	\$67,601	\$70,031
WASTEWATER OVERSTRENGTH AGREEMENTS	\$219	\$0	\$50
LEACHATE	\$328	\$387	\$394
CONTRACT REVENUE	\$89	\$86	\$86
SEPTAGE TIPPING FEES	\$812	\$915	\$760
DEWATERING FACILITY/ SLUDGE LAGOON	\$210	\$210	\$210
AIRLINE EFFLUENT	\$121	\$118	\$160
CUSTOMER LATE PAY./COLLECTION FEES	\$169	\$237	\$164
MISCELLANEOUS	\$140	\$128	\$139
	<u>\$72,081</u>	<u>\$69,682</u>	<u>\$71,993</u>
EXPENDITURES			
WASTEWATER COLLECTION	\$11,287	\$10,622	\$10,972
WASTEWATER TREATMENT PLANTS	\$18,054	\$19,160	\$19,139
SMALL SYSTEMS	\$1,175	\$1,323	\$1,323
DEWATERING FACILITY/ SLUDGE MGMT	\$134	\$331	\$636
BIOSOLIDS TREATMENT	\$1	\$101	\$101
LEACHATE CONTRACT	\$283	\$337	\$325
TECHNICAL SERVICES (SCADA)	\$1,355	\$1,563	\$1,784
ENGINEERING & INFORMATION SERVICES	\$3,419	\$3,400	\$3,556
REGULATORY SERVICES	\$929	\$1,465	\$1,434
CUSTOMER SERVICE	\$2,270	\$2,455	\$2,536
ADMINISTRATION & PENSION	\$4,853	\$4,585	\$5,997
DEPRECIATION	\$11,905	\$13,251	\$13,921
	<u>\$55,667</u>	<u>\$58,594</u>	<u>\$61,725</u>
OPERATING PROFIT	<u>\$16,415</u>	<u>\$11,088</u>	<u>\$10,268</u>
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$311	\$216	\$367
PNS FUNDING HHSP DEBT	\$2,000	\$0	\$0
MISCELLANEOUS	\$1,307	\$97	\$122
	<u>\$3,618</u>	<u>\$313</u>	<u>\$489</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$5,185	\$5,427	\$5,133
LONG TERM DEBT PRINCIPAL	\$11,747	\$12,783	\$12,965
AMORTIZATION DEBT DISCOUNT	\$98	\$119	\$113
MISCELLANEOUS	\$120	\$5	\$10
	<u>\$17,149</u>	<u>\$18,334</u>	<u>\$18,220</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES	<u>\$2,884</u>	<u>(\$6,933)</u>	<u>(\$7,463)</u>

* 2018/19 Operating Budget approved by the Halifax Water Board of Directors, January 25, 2018.

HALIFAX WATER
ESTIMATED REVENUES AND EXPENDITURES - STORMWATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2019 to MARCH 31, 2020
(in thousands)

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1/18 MAR 31/19	PROPOSED BUDGET APR 1/19 MAR 31/20
REVENUES			
STORMWATER SITE RELATED SERVICE	\$6,169	\$6,752	\$6,351
STORMWATER RIGHT-OF-WAY SERVICE	\$3,847	\$3,835	\$3,835
CUSTOMER LATE PAY./COLLECTION FEES	\$93	\$21	\$66
MISCELLANEOUS	\$105	\$89	\$95
	<u>\$10,214</u>	<u>\$10,696</u>	<u>\$10,347</u>
EXPENDITURES			
STORMWATER COLLECTION	\$4,797	\$5,239	\$5,750
TECHNICAL SERVICES (SCADA)	\$45	\$37	\$39
ENGINEERING & INFORMATION SERVICES	\$556	\$1,095	\$1,122
REGULATORY SERVICES	\$1,304	\$1,302	\$1,505
CUSTOMER SERVICE	\$278	\$253	\$273
ADMINISTRATION & PENSION	\$789	\$746	\$975
DEPRECIATION	\$807	\$954	\$1,208
	<u>\$8,575</u>	<u>\$9,626</u>	<u>\$10,873</u>
OPERATING PROFIT	<u>\$1,639</u>	<u>\$1,070</u>	<u>(\$526)</u>
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$70	\$48	\$82
MISCELLANEOUS	\$0	\$0	\$0
	<u>\$70</u>	<u>\$48</u>	<u>\$82</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$568	\$770	\$810
LONG TERM DEBT PRINCIPAL	\$1,253	\$1,591	\$1,692
AMORTIZATION DEBT DISCOUNT	\$10	\$18	\$22
MISCELLANEOUS	\$0	\$0	\$0
	<u>\$1,832</u>	<u>\$2,379</u>	<u>\$2,524</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES	<u>(\$124)</u>	<u>(\$1,261)</u>	<u>(\$2,968)</u>

* 2018/19 Operating Budget approved by the Halifax Water Board of Directors, January 25, 2018.

HALIFAX WATER
ESTIMATED REVENUES & EXPENDITURES, SEGREGATED BY REGULATED AND UNREGULATED ACTIVITIES
PROPOSED OPERATING BUDGET
APRIL 1, 2019 to MARCH 31, 2020
(in thousands)

DESCRIPTION	ACTUAL APR 1/17 MAR 31/18	APPROVED BUDGET * APR 1/18 MAR 31/19	PROPOSED BUDGET APR 1/19 MAR 31/20
REGULATED ACTIVITIES			
REVENUES			
METERED SALES	\$117,214	\$113,742	\$117,775
FIRE PROTECTION	\$7,074	\$7,074	\$7,074
PRIVATE FIRE PROTECTION	\$856	\$860	\$873
STORMWATER SITE RELATED SERVICE	\$6,169	\$6,752	\$6,351
STORMWATER RIGHT-OF-WAY SERVICE	\$3,847	\$3,835	\$3,835
OTHER OPERATING REVENUE	\$1,389	\$1,165	\$1,171
	<u>\$136,549</u>	<u>\$133,429</u>	<u>\$137,079</u>
EXPENDITURES			
WATER SUPPLY & TREATMENT	\$7,517	\$8,744	\$9,591
TRANSMISSION & DISTRIBUTION	\$8,591	\$10,323	\$11,127
WASTEWATER COLLECTION	\$11,249	\$10,501	\$10,840
STORMWATER COLLECTION	\$4,797	\$5,239	\$5,750
WASTEWATER TREATMENT PLANTS	\$18,054	\$19,160	\$19,139
SMALL SYSTEMS	\$2,285	\$2,492	\$2,534
SCADA, CONTROL & PUMPING	\$2,219	\$2,564	\$2,860
ENGINEERING & INFORMATION SERVICES	\$7,265	\$8,171	\$8,559
REGULATORY SERVICES	\$3,291	\$3,763	\$4,081
CUSTOMER SERVICE	\$4,861	\$5,487	\$5,687
ADMINISTRATION & PENSION	\$12,501	\$10,569	\$14,125
DEPRECIATION	\$21,241	\$23,302	\$25,022
	<u>\$103,870</u>	<u>\$110,315</u>	<u>\$119,316</u>
OPERATING PROFIT	<u>\$32,679</u>	<u>\$23,114</u>	<u>\$17,763</u>
FINANCIAL REVENUES (NON-OPERATING)			
INVESTMENT INCOME	\$694	\$480	\$816
MISCELLANEOUS	\$2,938	\$110	\$110
	<u>\$3,632</u>	<u>\$590</u>	<u>\$926</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$7,884	\$8,540	\$8,166
LONG TERM DEBT PRINCIPAL	\$21,247	\$22,576	\$19,802
AMORTIZATION DEBT DISCOUNT	\$202	\$245	\$202
DIVIDEND/GRANT IN LIEU OF TAXES	\$4,774	\$5,142	\$5,147
MISCELLANEOUS	\$0	\$0	\$11
	<u>\$34,107</u>	<u>\$36,503</u>	<u>\$33,327</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES - REGULATED ACTIVITIES	<u>\$2,203</u>	<u>(\$12,799)</u>	<u>(\$14,638)</u>
UNREGULATED ACTIVITIES			
REVENUES			
AEROTECH SEPTAGE TIPPING FEES	\$812	\$915	\$760
LEACHATE	\$328	\$387	\$394
CONTRACT REVENUE	\$89	\$86	\$86
DEWATERING FACILITY/ SLUDGE LAGOON	\$210	\$210	\$210
AIRLINE EFFLUENT	\$121	\$118	\$160
ENERGY PROJECTS	\$159	\$0	\$0
MISCELLANEOUS	\$37	\$37	\$38
	<u>\$1,755</u>	<u>\$1,753</u>	<u>\$1,648</u>
EXPENDITURES			
- DIRECT			
WATER SUPPLY & TREATMENT	\$18	\$25	\$26
WASTEWATER COLLECTION	\$0	\$108	\$118
WASTEWATER TREATMENT	\$456	\$769	\$1,062
SPONSORSHIPS & DONATIONS	\$87	\$266	\$61
DEPRECIATION	\$21	\$132	\$82
	<u>\$581</u>	<u>\$1,300</u>	<u>\$1,330</u>
- INDIRECT (ADMINISTRATION)			
	<u>\$0</u>	<u>\$95</u>	<u>\$110</u>
	<u>\$581</u>	<u>\$1,395</u>	<u>\$1,440</u>
OPERATING PROFIT	<u>\$1,174</u>	<u>\$358</u>	<u>\$207</u>
FINANCIAL REVENUES (NON-OPERATING)			
MISCELLANEOUS	\$696	\$416	\$443
	<u>\$696</u>	<u>\$416</u>	<u>\$443</u>
FINANCIAL EXPENDITURES (NON-OPERATING)			
LONG TERM DEBT INTEREST	\$0	\$23	\$16
LONG TERM DEBT PRINCIPAL	\$0	\$27	\$20
AMORTIZATION DEBT DISCOUNT	\$0	\$0	\$0
MISCELLANEOUS	\$269	\$10	\$11
	<u>\$269</u>	<u>\$61</u>	<u>\$47</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES - UNREGULATED ACTIVITIES	<u>\$1,600</u>	<u>\$713</u>	<u>\$804</u>
NET PROFIT (LOSS) AVAILABLE FOR CAPITAL EXPENDITURES - COMBINED ACTIVITIES	<u>\$3,804</u>	<u>(\$12,086)</u>	<u>(\$14,034)</u>

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