2020/21 Annual Business Plan

Approved by Halifax Regional Council
February 25, 2020

Approved by the Halifax Water Board
January 30, 2020

75 YEARS 1945 - 2020

STRAIGHT from the SOURCE

Halifax Water

Glossary

AMI	Advanced Meter Infrastructure
AM	Asset Management
AMP	Asset Management Plan
BPF	Biosolids Processing Facility
CBS	Corporate Balanced Scorecard
CCC	Capital Cost Contribution
DES	District Energy System
DOE	Department of Energy
E&IS	Engineering & Information Services
EMAP	Energy Management Action Plan
EMS	Environmental Management System
ERM	Enterprise Risk Management
ERP	Enterprise Resource Planning
GIS	Geographic Information System
H2O	Help to Others (Program)
HHSP	Halifax Harbour Solutions Plant
HRM	Halifax Regional Municipality
HRWC	Halifax Regional Water Commission
I&I	Inflow and Infiltration
IFRS	International Financial Reporting Standards
IRP	Integrated Resource Plan
IS	Information Services
IT	Information Technology
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
OI	Organizational Indicator
RDC	Regional Development Charge
RDII	Rain Derived Inflow and Infiltration
RF	Radio Frequency
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

Table of Contents

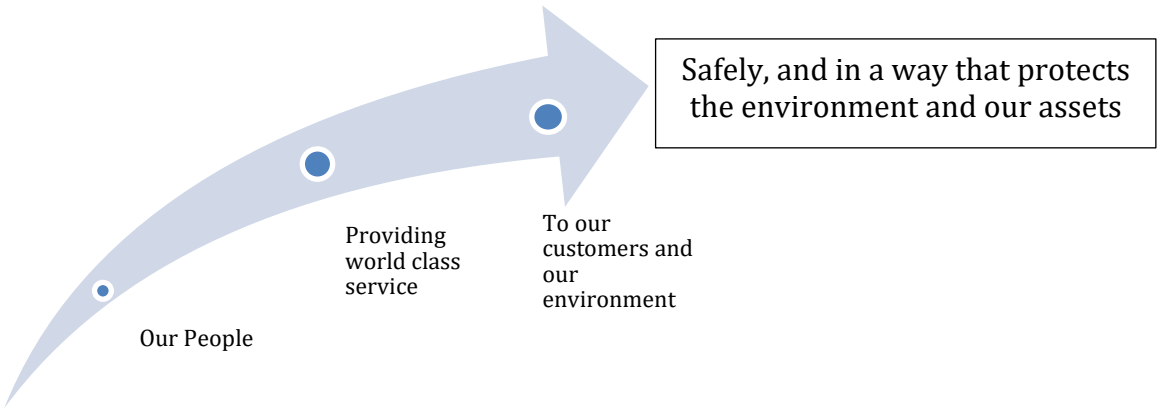
APPENDICIES

1. INTRODUCTION

January 1, 2020 marks 75 years of service for Halifax Water. Halifax Water has grown from the Halifax Public Service Commission established in 1945 to provide water service to the city of Halifax; to an integrated water, wastewater and stormwater utility serving 105,000 customers and an estimated population of 370,000.

Halifax Water has ambitious plans for continued innovation and improvement in 2020/21.

Figure 1 – Halifax Water Mission Graphic



Halifax Water's mission is **to provide world class services for our customers and our environment**; and the vision of how this will be accomplished is threefold:

1. We will provide our customers with high quality water, wastewater and stormwater service.
2. Through the 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.
3. We will fully engage employees through teamwork, innovation and professional development.

The organizational values were developed by employees working on Civility and Respect in the Workplace, and were accepted by the Halifax Water Board in December 2019. The vision, mission and values are shown in Appendix A.

Halifax Water has well established strategies that guide development of business plans, capital and operating budgets; and rate: The 2019 Integrated Resource Plan (IRP), the Debt Strategy, and Cost of Service Manual (COSM).

Halifax Water is working on a strategy to increase the level of capital expenditures to eventually reach the level recommended by the IRP to address the strategic drivers of asset renewal, growth, and regulatory compliance. Of the three strategic drivers included in the

IRP, asset renewal will present the greatest challenge recognizing the backlog of investments in relation to the replacement of aging infrastructure.

With thirteen years of experience operating as a "one water" utility delivering integrated water, wastewater and stormwater service, Halifax Water is well positioned to continue its tradition of stewardship.

Halifax Water delivers service through five departments; Water Services; Wastewater and Stormwater Services; Corporate Services, Engineering and Information Services; and Regulatory Services, with Administration led by the General Manager, who is responsible for overall administration of the utility. The organization structure is detailed within Section 3 and illustrated in Appendix B.

The 2020/21 fiscal year is the first year of the Five-Year Business Plan approved by the Halifax Water Board in January, 2020.

2. EXECUTIVE SUMMARY

Halifax Water develops both long-term and short-term business plans for the approval of the Commission Board. The 2020/21 Annual Business Plan reflects the strategic direction in the Five-Year Business Plan (2020/21 – 2024/25) which is also being presented to the Board for approval on January 30, 2020. The Annual and Five-Year Business Plans are consistent with the updated IRP approved by the Board in November 2019.

This annual business plan recognizes the need for further capital investment as contemplated in the updated IRP. This year Halifax Water's capital budget is $96.5 MM, and for the first time in many years, the capital investment required for water infrastructure is significantly higher than wastewater or stormwater due to the need to upgrade the two primary water supply plants ((WSPs) at Pockwock Lake and Lake Major due to a combination of factors such as changes in source water due to lake recovery and age of some treatment plant components. The budget provides a balanced investment in asset renewal, compliance and growth-related projects to support utility operations.

Investments in wastewater treatment facilities over the last 12 years have realized the goal of environmental compliance and in 2020/21 Halifax Water will develop a more detailed plan to upgrade the Halifax Harbour Solutions plants (HHSP) to meet the objectives stipulated in the federal Wastewater System Effluent Regulations by 2040.

Investing in research and investigating new technologies is increasingly important. In 2020/21, Halifax Water will realize the vision of expanding the current NSERC Industrial Research Chair with Dalhousie to include a wastewater stream. The last twelve years have realized tremendous benefit from drinking water research and it is expected a focus on wastewater will deliver similar results. 2020/21 will be the first full year of wastewater research as part of a multi-year program focused on plant optimization and contaminants of

emerging concern. From the water perspective, research will continue on the effects of lake recovery, lead, geosmin and corrosion control; and water operations will be investigating artificial intelligence for leak detection, pressure management and optimizing distribution operations to prevent breaks.

Technology is transforming all aspects of our business and changing how employees and customers can interact with the organization. Projects like the web portal for customers, an employee portal via a new payroll system, and a new corporate Enterprise Resource Management (ERM) system will continue to drive significant organizational change; requiring us to focus on enhancing training, professional development, organizational change management and communications.

Over the past three years, Halifax Water has upgraded most customer meters to advanced metering infrastructure (AMI). This new technology will enable Halifax Water to put water consumption data in the hands of the customer through a web portal in 2020/21. Detailed information on water consumption will allow refinement of Halifax Water's approach to water loss control to ensure it remains a world leader.

Halifax Water is taking positive actions towards climate adaptation in ensuring the updated IRP considers climate vulnerabilities to reduce risk to infrastructure and service delivery.

Climate change mitigation is the core driver for implementation of the Cogswell District Energy System as part of the Cogswell redevelopment. This exciting initiative will lead to significant reductions in GHG emissions compared to the business as usual case for new development.

Focusing on the environment component of the mission, in 2020/21 the mandate of Halifax Water's Energy Management Committee will be broadened to include GHG emission reduction, developing specific targets and actions for Halifax Water that support HalifACT 2050. One area of opportunity is anaerobic digestion for treating residual biosolids, to generate renewable gas and continuing to process the residual biosolids into Class A fertilizer for beneficial reuse. This could result in a reduction in conventional fossil fuel use and therefore GHG emissions further mitigating climate change.

The 2020/21 fiscal year will see continued investment to improve existing programs and services. For example, Halifax Water is proposing to expand the lead service line (LSL) rebate program to enable Halifax Water to meet its goals for LSL replacement by 2039 by integrating with HRM street renewal projects and by replacing the portion of LSLs on private property at the utility's expense.

Customer satisfaction and employee engagement are both fundamental to success of the utility. Halifax Water is entering the 75th year of service with a commitment to continually innovate, improve, and remain cost-effective with the understanding of the importance of keeping the cost of services affordable.

From a corporate perspective, the utility will focus on several challenges and opportunities next year, namely:

1. **Implementation of the updated IRP and optimization of the processes used to plan, procure, and deliver capital projects:** The current water, wastewater and stormwater rates are insufficient to meet the funding requirement identified in the IRP. The IRP acknowledges that wastewater and stormwater assets have been grossly underfunded historically. Institutional capacity will have to be optimized over the term of this Business Plan in order to deliver the expected capital projects; and the processes used to plan, procure and deliver capital projects will be reviewed to achieve a target of spending 80 – 90% of the annual capital budget within the year it is approved. This is an aggressive target, given the multi-year nature and complexity of some of Halifax Water's capital projects and the relationship to the HRM capital program.

2. **Enhanced Customer Service:** Investment in employee training and technology are key to enhancing customer service. With the completion of installation of advanced meter infrastructure as part of the Customer Connect Project in 2020; Halifax Water is now focused on building and implementing a web portal for customers. The expectations of customers are increasing rapidly and the adoption of new technologies and business process is paramount to provide the expected level of customer service. Halifax Water has and will continue to invest in enhancing integration and functionality of existing systems Geographic Information System (GIS), Computerized Maintenance Management Systems (CMMS), the telephony system, and Customer Relationship Management (CRM) to enhance the customer experience through its Customer Care Centre. Greater emphasis will be placed on measuring customer satisfaction, and utility performance relative to customer centric service levels.

3. **Lead Line Replacement Program:** The utility will further enhance its program to replace all LSLs on the Halifax peninsula and downtown Dartmouth areas by increasing the level of financial assistance, and pushing for more integration of LSL replacements in conjunction with the HRM street renewals. This is based on industry best practice and recent research conducted in partnership with Dalhousie University. As Halifax Water is in the health protection business, complete LSL renewal will be pursued for public health outcomes.

4. **Wet Weather Management:** The level of service offered by the utility can be increased if innovative business processes and technology are embedded in day to day operations for the ultimate protection of the environment. Managing the effects of wet weather, and reducing inflow and infiltration (I&I) are key to creating capacity within existing infrastructure and avoiding some future capital costs. In addition to making continued investment in the wet weather management program, next year Halifax Water will be exploring new programs and tools to work with customers to address I&I issues on private property. It is estimated that more than 50% of I&I originates from private property.

5. **Employee Satisfaction:** In the next five years many of Halifax Water's workforce will be eligible to retire. To compete, attract and retain top talent, in addition to providing competitive wages and benefits, Halifax Water must strive to create a respectful work environment where employees are fully engaged through teamwork, innovation and professional development. Continued investment in improving internal communications, talent management, training, civility and respect in the workplace, and diversity will help create the kind of work environment where our employees are engaged and provide service safely, and in a way that protects the environment, our assets, and always keeps the customer in mind.

6. **Regulatory Compliance:** 2020/21 will see the implementation of a new system to track regulatory compliance and support regulatory compliance activities. In addition to improved systems and processes to support environmental regulatory compliance, a new payroll system being implemented in 2020/21 will have future functionality that will promote Occupational Health and Safety (OHS) through tracking of training and certifications required by employees.

7. **Environmental Stewardship:** Halifax Water's updated IRP contains projects that will help the utility with climate change adaptation and mitigation. Recent research indicates that climate change is accelerating, as evidenced by projections of sea level rise, more intense storm events, and changing precipitation patterns. Our environmental stewardship will also be enhanced through extension of the Environmental Management System (EMS) (ISO 14001) on a corporate wide basis. The EMS will help minimize the impact our operations have on the environment, and promote compliance with applicable laws, regulations, and other environmentally oriented requirements.

8. **Water and Wastewater Research:** Building on the success of the current drinking water research program with Dalhousie University, Halifax Water is expanding the program to include wastewater to ensure that treatment plants are optimized and upgraded to meet the current federal wastewater regulations at the lowest cost. Wastewater research focused on optimizing treatment processes and dealing effectively with contaminants of emerging concerns (CEC) may help Halifax Water reduce what is estimated to be a $425 M cost to upgrade the three HHSP from advanced primary to secondary treatment.

9. **Technological Investment:** Halifax Water's Five-Year IT Strategic Plan calls for continued investment in core operating systems. In 2020/21 Halifax Water will be going live with a new payroll solution (including an employee portal), and a web portal for customers. A project to implement a new Enterprise Resource Planning system (ERP) will be underway, and will continue to make investments in foundational security projects that support cyber-security, continuity of service and protection of data.

10. **Enterprise Risk Management:** 2020/21 will be the first year that Halifax Water is using a formalized ERM framework to track and report risks to the Halifax Water Board.

From a departmental perspective, Strategic Objectives for 2020/21 are shown below.

Water Services

- Water research program – continued research on understanding and adapting to lake recovery, and distribution system water quality
- Continue Lake Major WTP upgrade program to address lake recovery and address identified upgrade requirements
- Initiate the process to upgrade Pockwock to a conventional plant including upgrades to address changing water quality
- Improve processes to assure maintenance of distribution system water quality during water main breaks
- Obtain NSUARB approval to enhance the LSL program, and increase integration with municipal street renewals
- Complete LSL renewals in conjunction with municipal street renewals in 2020/21
- Complete Dam safety review and develop strategy to address findings on a priority basis.

Wastewater and Stormwater Services

- Complete the first full year of WW research on plant optimization, assess success and report to the Halifax Water Board
- Confirm the timeline and nature of HHSP upgrades leading to WSER Compliance
- Wet weather management – Complete planned projects for 2020/21 and explore opportunities to implement programs to reduce I&I on private property
- Complete the RFP process for Bio-solids and resource recovery
- Odour Issues – develop level of service and strategy to achieve level of service
- Flooding Issues – continue to regularly interface with the municipality to mitigate flooding
- Stormwater Services – evaluate success of doing large cross culvert replacements in house, and identify other similar opportunities

Regulatory Services

- Commence corporate implementation of EMS
- Obtain approval for revised Regional Development Charge (RDC)
- Maintain regulatory compliance and enhance tracking and reporting
- Obtain larger water plant approvals, or continued permission to operate
- Implement new permitting system for Engineering approvals
- Evaluate possible ISO 45001 certification (safety), and complete physical security audit
- Complete discussions with NS Real Estate Commission re: point of sale process to promote disclosure and resolution of issues at point of sale.

Engineering & Information Services

- File updated IRP with NSUARB and gain acceptance of NSUARB and stakeholders
- Optimize capital project delivery and show improvement over prior year % of annual capital budget spent (CBS target – annually spend 80% - 90% of annual capital budget)
- Finalize business case and approval for East/Central Depot Consolidation
- HRM Cogswell Area Redevelopment Infrastructure Relocation
- Water Supply Plant Upgrades JDK and Lake Major
- Deliver significant IT projects – new payroll system, Customer Portal, and ERP
- Implement enhanced RISK based condition assessment & improved decision making tools for asset management
- Update satellite imagery and impervious area data in GIS and implement business process to ensure it remains current

Corporate Services

- Obtain increases for water and wastewater rates, and various fees and charges
- Update impervious area and review stormwater service, costs and rate structure
- Develop a plan and timeline to meet IRP level of spend
- Implement a web portal for customers and enhance customer experience – complete remaining AMI installs, reduce call wait time and abandonment rates. Enhance integrations between Customer Care Centre and operations, and set measures for service levels and targets for customer satisfaction.
- Evaluate the transition of bill printing to the HRM print shop, redesign the bill, and plan to offer monthly customer billing

- Select new ERP system and finalize updated business processes
- Update funding strategies, including implementing an updated RDC, new rates for water and wastewater services, and new fees and charges including a manual read fee for non-radio frequency (RF) customers

Administration

- Seek municipal by-law for mandatory connection and obtain Halifax Water Board, and NSUARB approvals for Cogswell District Energy
- Seek approval for HRWC Act Amendments (limitation of liability for Cogswell DES, and a few housekeeping items)
- Implement updated Governance Manual, and improved Board reporting
- Implement Enterprise Risk Management, hire ERM & Internal Audit Coordinator and develop processes to update and report on risk
- Talent Management – Train all supervisors in providing feedback, and conduct front line supervisory training for new supervisors and future leaders
- Employee engagement – Train all employees on psychological health and safety, and develop and implement action plan based on 2019 Employee Survey results
- Enhance customer communications, particularly around rate increases, and stormwater service

In order to maintain operations and achieve the strategic objectives next year, Halifax Water will have to increase rates. Annual revenues will need to increase with the primary focus on the capital needs driven by asset renewal. This will be the first increase in rates since April 1, 2016; as Halifax Water has been able to provide stable rates for over four years. A water and wastewater rate application is planned for February 2020, with new rates requested for September 1, 2020. An application to adjust stormwater rates is planned for the fall of 2020 with new rates to take effect April 1, 2021.

Halifax Water is not alone in its quest for increasing, and more sustainable funding. Unfortunately, water, wastewater and stormwater assets have been underfunded throughout North America, and other municipalities/utilities have made, or are making plans to increase rates. The projected rate increases associated with this business plan will be viewed in the context of customer affordability, with a goal of maintaining an average annual residential bill for water, wastewater and stormwater service that is less than 2% of median household income. The utility is proposing to continue with the H20 (Help to Others) Program to support low income customers, with funding from unregulated activities; and hopes to increase the funding, awareness, and utilization of this program.

Inherent in the business activities for Halifax Water is an obligation to provide value for customers as stewards of essential services. To that end, the Business Plan highlights very formal programs to deliver efficient and effective service through Enterprise Risk Management, Asset Management, Energy Management, Wet Weather Management, and the Cost Containment Program. The Wet Weather Management program, in particular, presents an opportunity to improve service delivery at a lower cost and has already shown positive results. A structured approach is in place, which is similar to the process used by the utility for water loss control. Halifax Water is recognized as a world leader in water loss control and the corporate goal is to put wet weather management in the same category.

The 2020/21 Business Plan provides an overview of the services provided by Halifax Water and an overview of the operating and capital budgets to support the delivery of these services. The Business Plan projects an operating deficit of $15.9 M, as indicated in the operating budget summary in Figure 2, and reflects the rates most recently approved by the NSUARB. 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 a loss is indicated for 2020/21 and new rates will not come into effect before fall 2020, the utility has accumulated operating surplus which will be used to support continued operations until rates are adjusted.

Figure 2 – Operating Budget Summary

Operating Budget Summary (in thousands)

	Actual 2018/19	Approved Budget 2019/20	**Proposed Budget 2020/21**	Budget/Budget Variance (Unfavourable)
Operating Revenue	$138,413	$138,727	$138,618	($109)
Operating Expenses	$105,731	$115,088	$118,110	($3,022)
Operating Surplus	$32,682	$23,639	$20,508	($3,131)
Financial Revenue	$1,898	$1,369	$619	($750)
Financial Expenses	$33,190	$33,374	$37,076	($3,701)
Net Surplus (Deficit)	$1,390	($8,366)	($15,949)	($7,583)

The utility faces pressures associated with asset renewal and growth-related infrastructure, as described in the 2019 IRP and discussed in Section 5.13 of this document. Halifax Water continues to increase its investment in growth related infrastructure and with funding from the RDC, will continue focus on Inflow and Infiltration reduction in the Halifax area to increase wastewater trunk sewer capacity. In 2019, Halifax Water submitted an application through the Investing in Canada Infrastructure Program to leverage funding for upgrades to water transmission mains on the Halifax peninsula; which was not accepted. This

application will be put forward again when the opportunity arises. The capital budget provides a comprehensive investment across all asset classes of $96,514,000 M as outlined in Section 4.1.

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 Supervisory Control and Data Acquisition (SCADA) and process control services for all of Halifax Water. This department is organized to maintain and operate the water system as a holistic system, with managers assigned accountability for clearly defined aspects of the water 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.

- **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 1558 km of transmission and distribution mains, 8400 fire hydrants, 85,000 service connections, 143 pressure control/flow metering facilities, 21 pumping stations, 16,000 valves and 16 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 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 LSL 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 2017, Halifax Water initiated a program intended to remove all LSLs by 2050. Enhancements to the program are proposed for 2020 that will see all LSLs replaced by 2039 or earlier, subject to NSUARB approval. This program is discussed in more detail in Section 5.9 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

Wastewater Services 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 (HRM) 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 WWTF 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 1425 km of collection pipes, 167 Pump Stations, 21 Combined Sewer Overflow facilities and 85,000 service connections.

- **Septage Treatment Services:** This is an unregulated activity for Halifax Water, 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 in 2019, most of the septage has been diverted to the Aerotech WWTF from the core service area.

- **Fleet and Building Maintenance Services:** Maintenance and repair of approximately 236 vehicles ranging from smaller utility vehicles to large excavation equipment, replacement of vehicles on a life cycle costing basis, and vehicle 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 approximately 900 km of stormwater collection pipes, 45 stormwater retention facilities and over 600 km of ditches, 2337 cross culverts and 16,000 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 disputed utility decisions.

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 support the utility.

The E&IS Department has four core areas of responsibility and seven specific operational sections delivering programs. The four core areas of responsibility are Asset Management, Infrastructure, Energy Efficiency and Information Management.

Asset Management: Is responsible for 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 IRP, and the development of the 5-Year and 1-Year Capital Budget.

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

Energy Efficiency: s responsible for the provision of engineering services related to energy management and energy efficiency of water, wastewater and stormwater infrastructure.

Engineering Information: Is responsible for the corporate 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.

Information Services: Is responsible for 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 support for all information technology (IT) related problems or requirements. The 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).

Environmental Engineering: Is responsible for two key programs, Pollution Prevention (P2) and Inflow and Infiltration (I&I) reduction. This past year members of the section have been providing support for updating Nova Scotia Environment (NSE) permits to operate.

Pollution Prevention: Is responsible for promoting compliance of waste discharges with the Rules and Regulations, through education and inspections. The Pollution Prevention section 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 section 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 section is also using incident data from CityWorks to help focus Pollution Prevention efforts.

I&I: The I&I section assists 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 section is finalizing investigations in both areas and 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 water withdrawal permits will expire this coming year:

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

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

Engineering Approvals: Is responsible for reviewing extensions of existing infrastructure, requests for new service connections, and enforcement of Halifax Water's design standards and specifications. The Engineering Approvals section continues to be engaged with HRM as the municipality continues to implement its Regional Plan, updated in 2014, and on the completion of its Centre Plan. The section continues 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 the municipality's use. Subsequently, the section 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.

The Engineering Approvals section is currently updating the RDC to reflect the 2019 IRP. Stakeholder Consultation was held in 2019 and a public hearing is scheduled in February 2020. The update charge will be in effect by the summer of 2020.

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 (CCC) area.

In keeping with the IT Strategic Plan, Halifax Water is engaged with HRM to replace their permitting software, HANSEN. It is anticipated the implementation of the new software will occur in 2020.

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

Regulatory Compliance: Is responsible for 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. Similar sampling is completed for wastewater effluent parameters for compliance with permits issued by NSE, consistent with federal regulations. The section is also tasked with compiling and submitting reports associated with the sampling results to NSE. The section continues to support E & 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 in November 2017 which contains nine recommendations. For the past two years, staff have been following up on the recommendations to improve business processes, reduce risk and enhance corporate performance.

Stormwater Engineering: Is responsible for reviewing drainage complaints, supporting Wastewater and Stormwater Operations and review of stormwater billing appeals. With the approval of the stormwater credit program in 2017, applications are just starting to be submitted for review and four have been processed to date.

Environmental Management: Is responsible for the Environmental Management System (EMS) and oversees the adherence to the new ISO 14001 – 2015 standard for our certified facilities at Pockwock, Lake Major, Bennery Lake, and Herring Cove, and Dartmouth WWTFs. It is anticipated the Halifax and Mill Cove WWTFs will be certified in 2020.

Halifax Water has engaged a consultant in January 2020 to develop the framework for a corporate wide EMS program. It is anticipated the implementation of a corporate EMS will be completed by 2022. Expansion of the EMS program presents a significant opportunity to reduce Halifax Water's environmental footprint.

3.5 Corporate Services

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

Finance: Is responsible for development of operating budgets, funding plans for the capital budget, rate applications and financial modeling for business plans. This group assists E&IS 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, pension plan administration, internal control testing, and quality assurance activities around financial transactions including payroll.

Accounting: Is responsible for timely and accurate financial reporting, financial accounting, fixed asset accounting, financial analyses, financial statements, revenue and cash flow, developing and implementing accounting procedures and internal controls, and coordinating and supporting the annual audit.

Procurement: Is responsible for planning and delivering procurement services to the organization ensuring compliance with corporate policies and legislation. This section develops and implements monitoring and reporting of systems, programs, procedures for inventory and procurement to support acquisition of goods and services to meet Halifax Water's objectives.

Customer Care: Is responsible for managing all customer contacts, establishing corporate customer service standards, goals and objectives, and coordinating the improvement of business processes in the area of Customer Care and other departments.

Metering and Billing: Is responsible for installing, maintaining, reading, sampling, and testing meters, establishing standards, and billing customers in a timely and accurate manner.

The most significant objectives for Corporate Services in the 2020/21 fiscal year are:

- Enterprise Resource Planning (ERP) system replacement – Halifax Water issued an RFP to find a new corporate ERP solution in 2019. A new ERP will be selected in 2020. In late 2019/20 Halifax Water established a project team to begin planning to upgrade the ERP system. This project will impact almost all business processes and employee groups.

- Review impervious area used for stormwater billing, update satellite imagery, and business processes to ensure impervious area from new development is captured accurately.

- Complete the Customer Connect - 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 is substantially completed; however there will be 3,000 – 4,000 meter installs remaining for the 2020/21 fiscal year.

- A new telephony system is being implemented in February 2020. In 2020/21, the Customer Care business process review will continue 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). These will 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.) An RFP was issued for a new customer portal in 2019, and the new technology will be selected and implemented in 2020/21., Customers will be able to access information about their water consumption, water saving tips, account information and billing characteristics, and conduct some business on-line with 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 2020/21, with a view to implement monthly billing in conjunction with the new ERP system. The work on monthly billing is dependent on the Customer Connect project as it is necessary to understand how many customers will have their meters manually read in order to finalize the business case for monthly billing.

- Halifax Water will apply for increases to rates for water and wastewater service in 2020, and will also be updating the Halifax Water Rules and Regulations. A public hearing is scheduled in June 2020.

3.6 Administration

General Managers' Office: Is responsible for overall administration of the utility. Some initiatives led by the General Manager's Office include governance, business planning, public and stakeholder relationships, and employee relations. Communications, Legal Services and Human Resources fall directly under the General Manager's Office.

Communications: Is responsible for external and internal communications, maintaining the internet and intranet sites, media relations, social media, and providing support to operations and capital delivery to ensure the public is kept informed of significant projects, service disruptions, and initiatives.

Legal Services: Includes the legal function, corporate records management, FOIPOP administration as well as land administration. The General Counsel acts as the Corporate Secretary to the Halifax Water Board and helps ensure that board governance processes function smoothly.

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.

4. BUDGET SUMMARY

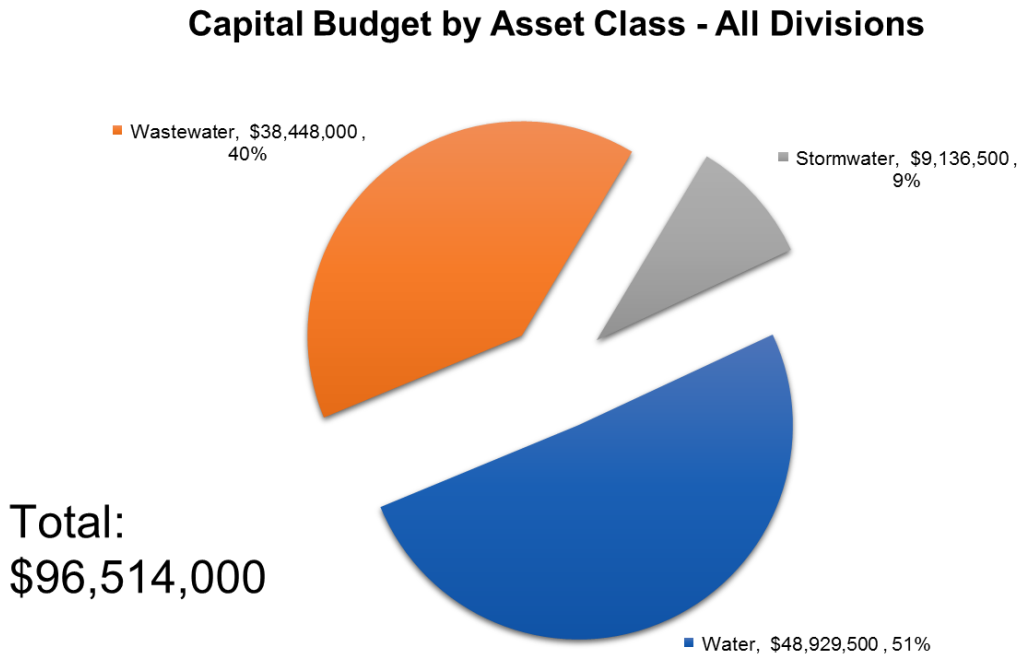
4.1 Capital

Halifax Water's 2019 IRP identifies a 30-year capital investment plan valued at $2.7 Billion (net present value). In relation to the IRP, the capital budget program focuses on providing required infrastructure for asset renewal, regulatory compliance and growth.

The capital program helps ensure that we continue to provide services in a cost-effective and efficient manner with a focus on long-term sustainability.

The proposed Capital Budget for Halifax Water for the fiscal year April 1, 2020 to March 31, 2021 is shown in Attachment C. It includes projects for Water, Wastewater, and Stormwater service delivery with a total value of $96,514,000, as demonstrated in Figure 3 below.

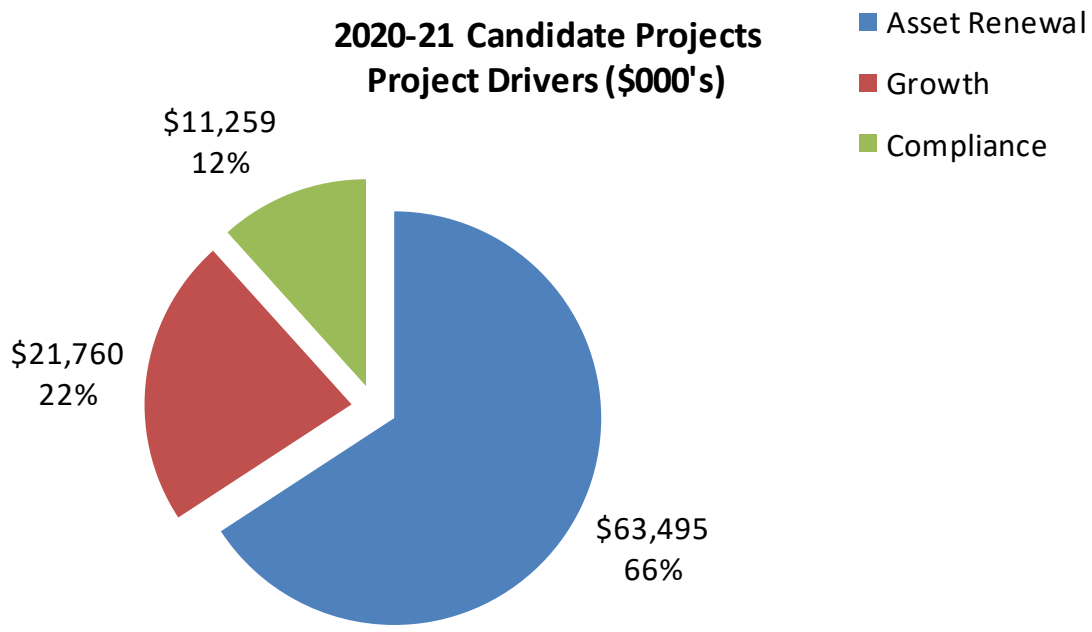
Figure 3 - Capital Budget by Asset Class



The Capital Budget document reflects the vision of the recently updated IRP. This 30-year plan provides a strong vision for the infrastructure requirements needed to ensure the long-term integrity of the utility's assets. The 2020/21 Capital Budget includes many projects from the IRP that will begin to shape the overall direction of the capital plan for years to come.

The 2020/21 Capital Budget broken down by strategic driver can be seen in Figure 4.

Figure 4 – Capital Budget by Strategic Driver

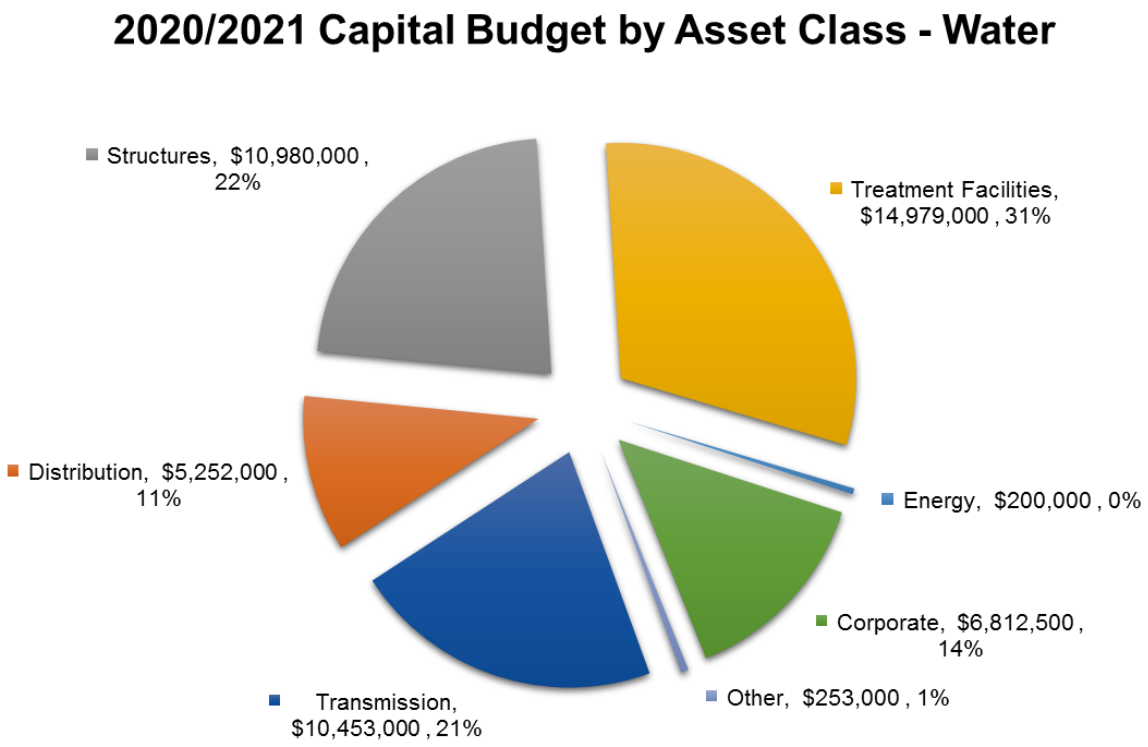


The Capital Budget funds traditional capital requirements for utility operation, along with a focus on several key strategic initiatives. The following sections provide highlighted details of the Capital Budget by asset category.

Water: Major Water capital projects include:

- Main Street to Caledonia Road Transmission Main
- Water Distribution – Main Renewal Program
- LSL Replacement Program
- Design phase of the JD Kline & Lake Major Water Supply Plant Upgrade projects
- Bedford South Reservoir – New Construction
- HRM Cogswell Redevelopment – Water Transmission Main Relocation

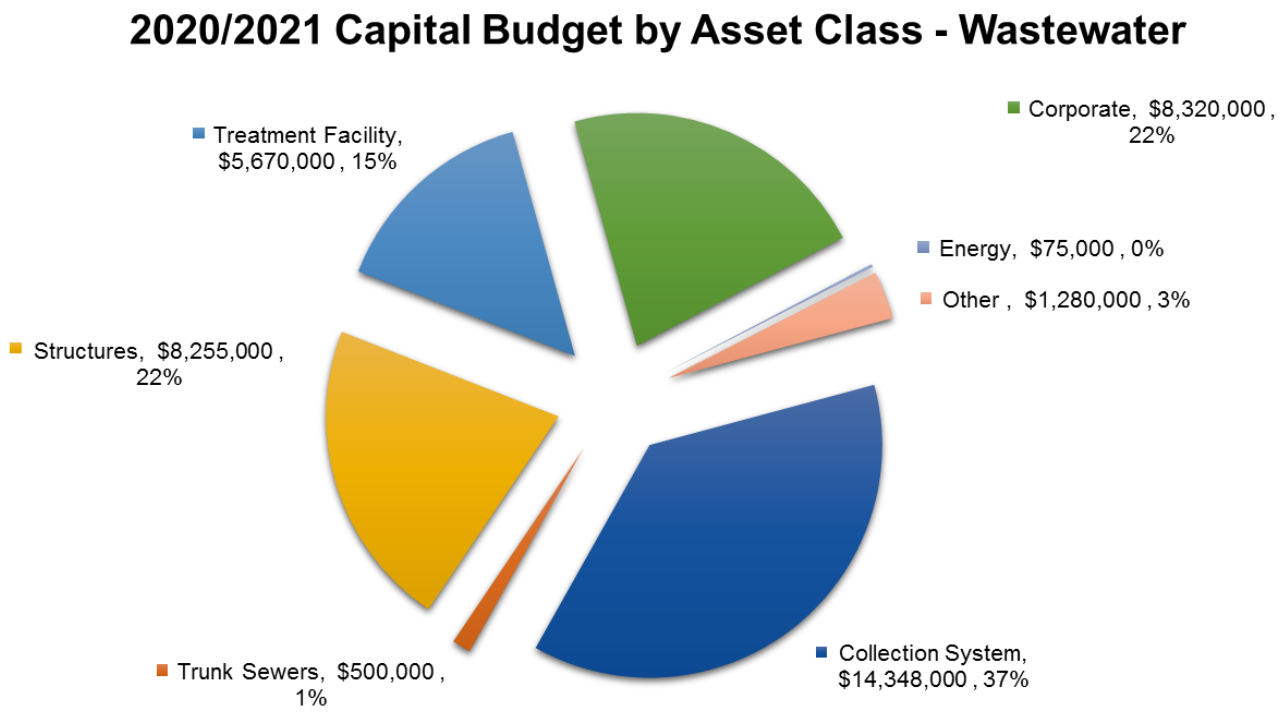
Figure 5 – Water Capital Budget



Wastewater: Major Wastewater capital projects include:

- Wastewater System – Trenchless Rehabilitation Program
- Integrated Wastewater Collection Projects
- Autoport/Main Road Pumping Station Replacement
- Wastewater Lateral Replacements
- Halifax North Peninsula Sewer Separation Program
- HRM Cogswell Redevelopment – Wastewater Sewer Relocation

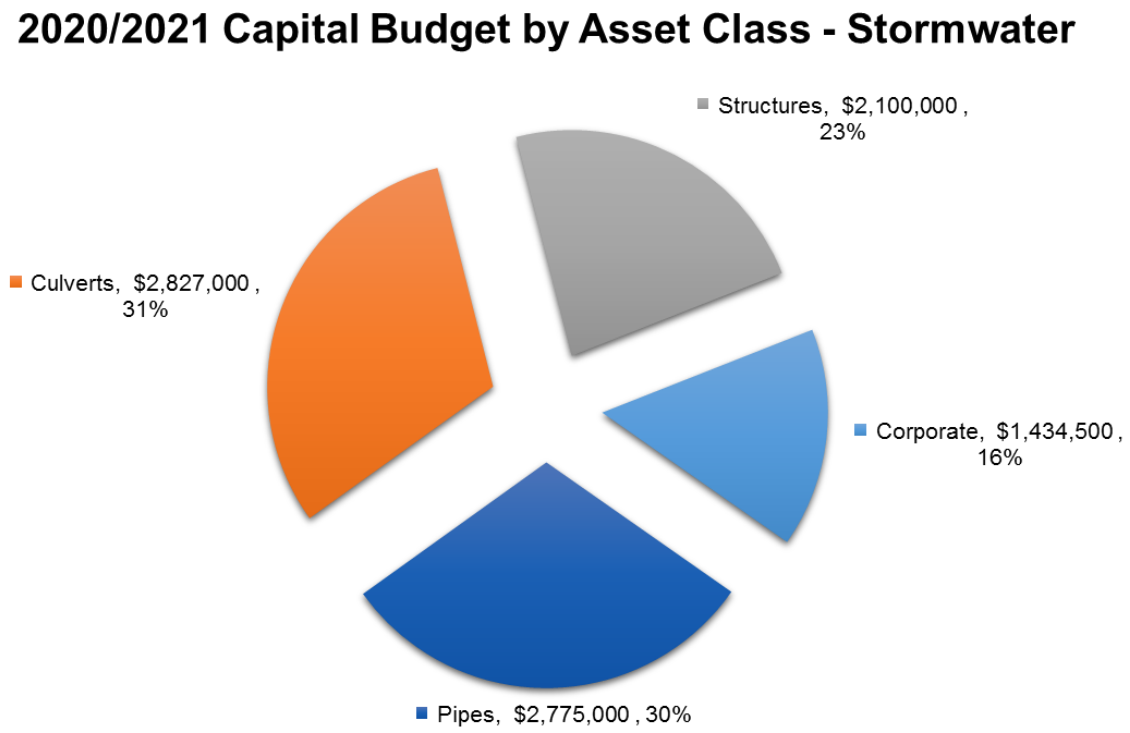
Figure 6 – Wastewater Capital Budget



Stormwater: Major Stormwater capital projects include:

- Integrated Stormwater Collection Projects
- Driveway and Cross Culvert Renewal Program
- Ellenvale Run Retaining Wall System Replacement – Phase 4
- HRM Cogswell Redevelopment – Storm Sewer Relocation

Figure 7 – Stormwater Capital Budget



Corporate Projects: Major Corporate Projects include:

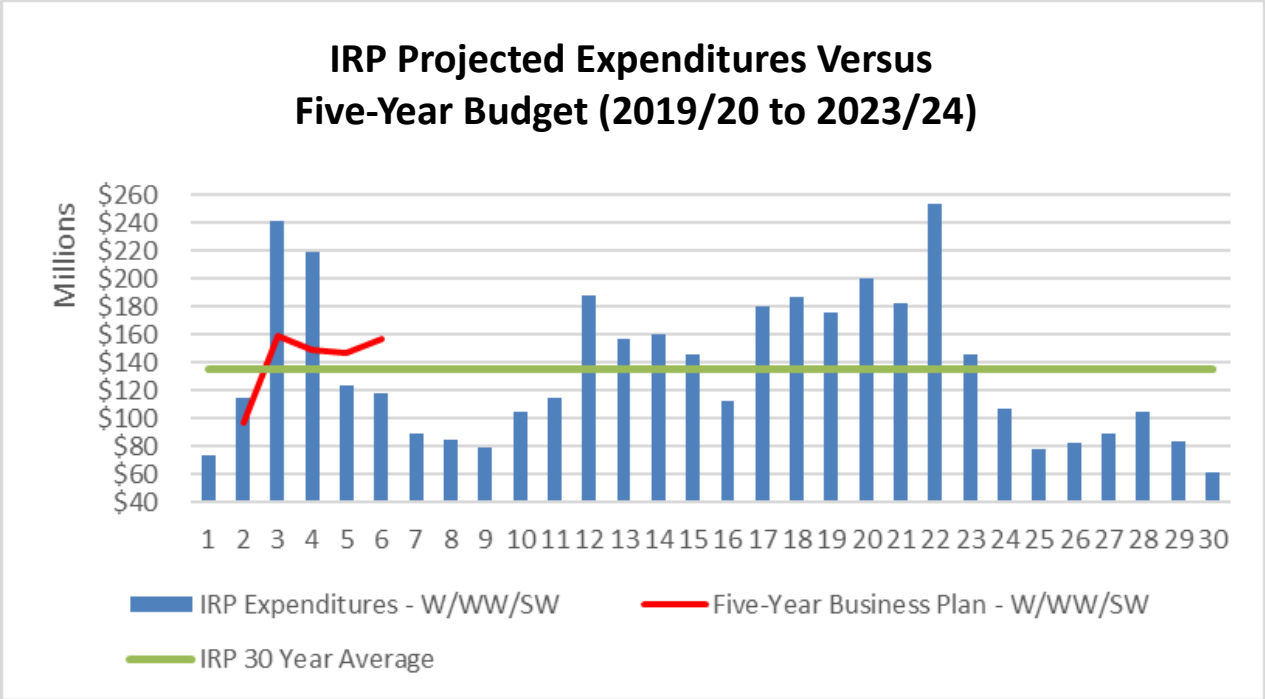
- IT Strategic Plan Implementation Year 3
- Corporate Flow Monitoring Program
- Design Phase of East/Central Operations Facility
- Fleet Upgrade Program

At this time, the 2020/21 capital budget does not include the Cogswell District Energy System (DES). If that project proceeds, it will have a separate capital budget which would be brought forward to the Halifax Water Board in conjunction with the business case and recommendation to proceed. For more details on the Cogswell DES please see Section 5.7.

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

The following chart shows the proposed capital budget for the next five years compared to the 2019 IRP. The chart indicates a continued general increase in capital expenditures towards the target level.

Figure 8 – Capital Budgets versus IRP Recommended Level of Spend



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

Capital funding sources:

- Depreciation (funded within the rates) $29,035,000
- Debt $48,460,490
- Regional Development Charges $3,948,400
- External cost sharing (Federal & Provincial) $5,722,910
- CCCs $9,347,200

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%.

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 RDCs through reprioritization of growth projects or additional utilization of debt if required.

Figure 9 – Capital Funding Sources

2020/21 Capital Funding		
Water:	Depreciation	$11,479,000
	Debt	$23,183,300
	RDC	$150,000
	External Funding Building Canada & CWWF	$4,770,000
	CCCs	$9,347,200
	TOTAL	**$48,929,500**
Wastewater:	Depreciation	$15,974,000
	Debt	$17,740,970
	RDC	$3,798,400
	External Funding	$934,630
	TOTAL	**$38,448,000**
Stormwater:	Depreciation	$1,582,000
	External Funding	$18,280
	Debt	$7,536,220
	TOTAL	**$9,136,500**
TOTAL CAPITAL FUNDING:		**$ 96,514,000**

4.2 Operations

The operating budget prepared for 2020/21 is based on year one of the Five-Year Business Plan submitted to the Halifax Water Board in January 2020. The operating budget is built based on the current rates for service. The operating budget shows a loss of $15.9 M on a cash basis. If accrued pension and post-employment benefits were included, the loss would be $26.2 M. 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 in previous years have resulted in surpluses that allowed Halifax Water to delay increasing rates for over four years. The detailed 2020/21 Operations Budget is contained in Appendix D. A summary version of the Operations Budget is shown in Figure 10 – Operating Budget Summary.

Halifax Water's operating budget is sensitive to many factors including the rate of capital project delivery, interest rates, weather, water consumption, and customer growth.

Figure 10 – Operating Budget Summary

Operating Budget Summary (in thousands)

	Actual 2018/19	Approved Budget 2019/20	**Proposed Budget 2020/21**	Budget/Budget Variance (Unfavourable)
Operating Revenue	$138,413	$138,727	$138,618	($109)
Operating Expenses	$105,731	$115,088	$118,110	($3,022)
Operating Surplus	$32,682	$23,639	$20,508	($3,131)
Financial Revenue	$1,898	$1,369	$619	($750)
Financial Expenses	$33,190	$33,374	$37,076	($3,701)
Net Surplus (Deficit)	$1,390	($8,366)	($15,949)	($7,583)

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 57.4% of water and wastewater revenues coming from volumetric rates and 42.6% from base charges. Operating revenues are projected to be $764 thousand less than the 2019/20 budget, based on the following assumptions:

- Volumetric water and wastewater revenues are based on projected actual consumption for 2019/20 with no decrease projected. For the first nine-month of 2019/20, consumption was down 0.12% from the prior year and down 0.9% from budget. This is attributable to many factors – growth in customers, improved meter accuracy, and weather conditions.

- Stormwater revenue is budgeted based on projected 2019/20 stormwater water revenues. Stormwater revenues in 2019/20 are less than budgeted and a project that was initiated in 2019/20 to ensure impervious area from new development is being captured is on-going.

- Other wastewater service revenue, including septage tipping and dewatering, have decreased as the customer base has changed.

- The projected increase in new customers is 638 which are allocated to various meter sizes based on a review of connection history.

Operating revenues are budgeted to decrease by $109,000 to $138.6 M. Non-Operating revenues are budgeted to decrease by $750 thousand or 54.8% to $619 thousand compared to 2019/20, as shown in Figure 10 – Operating Budget Summary.

Operating revenues are very sensitive to changes in consumption. Halifax Water has experienced net metered consumption decreases of 24.7% since 2001/02. On average, the annual reduction is 1.64% which has been managed through changing rate structures, diversifying revenues (stormwater with a different billing determinant), controlling costs, and increasing rates.

Timing of development, form of development and new customer growth is difficult to predict. The 2018/19 and 2019/20 years saw slight increases in consumption which is largely due to the installation of advanced meter infrastructure and replacing old meters, which in some cases, were under-registering consumption. Water consumption is sensitive to a combination of factors including development activity, customer growth, weather, and economic pricing signals. Halifax Water manages the risk of decreasing consumption by making prudent assumptions when preparing budgets and financial models.

Alternative Revenue: Revenues from unregulated business activities are decreasing in 2020/21 due to lower projected septage tipping revenues. Septage tipping revenue is projected to decrease by 33.6% due to decreasing volumes as some customers are tipping outside the service area. 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 $1.1 M in 2020/21, a decrease from the budget of $1.6 M in 2019/20.

EXPENSES:

Halifax Water's Operating Budget is shown on an accrual basis, with the exception of the liability for future employee benefits (pension) that is excluded from revenue requirements for rate making purposes.

The utility faces pressure associated with growth, asset renewal, and compliance with regulatory requirements, as described in the IRP. Halifax Water has taken significant steps to reduce risks in these areas with the development of the RDC, 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. As outlined in Figure 11 below, operating expenses are budgeted to increase $3 M or 2.6% compared to the 2019/20 Operating Budget. One of the largest components of operating expenses is depreciation, which will increase by $2.3 M or 9.3%. Debt Servicing will increase by $2.7 M or 9.7% when compared to the 2019/20 Operating Budget.

Figure 11 – Expense Summary

Expense Summary (in thousands)

	Actual 2018/19	Approved Budget 2019/20	**Proposed Budget 2020/21**	Budget/Budget Variance (Unfavourable)
Operating Expenses	$105,731	$115,088 *8.8%*	$118,110 *2.6%*	($3,022)
Debt Servicing	$28,145	$28,206 *0.2%*	$30,930 *9.7%*	($2,725)

Figure 12 – Impact of New Full-time Equivalent Positions on Operating Budget

	New FTE's	**$**
By Service:		
Administration and General	1	88,310
Customer Service	1	72,189
Engineering and IS	2	176,091
Environmental Service	2	166,873
Wastewater	4	281,100
Water	1.6	173,385
	11.6	957,948

Salaries and Benefits: The budget for 2020/21 includes an allowance for 11 additional positions, the majority of which are new. 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 the non-union salary policy and unionized wages are based on collective agreements signed in June 2019. Salary and wage assumptions also includes 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 – 6.0%
- Furnace Oil – 3.0%
- Natural Gas – 10.0%

Debt Financing: Debt payments are budgeted to support the new debentures planned for the 2020/21 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 increase to $30.9 M; a 9.7% increase from the 2019/20 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 $255 M as at March 31, 2021.

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 by $2.3 M to $27.4 M in 2020/21 from $25.1 M in the 2019/20 budget, which is an increase of 9.3%.

Grant in Lieu of Taxes (Dividend to HRM): The water dividend agreement was renewed in September, 2014 for a five-year term (April 1, 2015 - March, 2020). Negotiations are underway to review the dividend agreement. The renewal of the dividend agreement and any change are subject to Halifax Water Board, HRM Council, and NSUARB approval. The dividend is calculated as 1.56% of the water system rate base and is budgeted at $6.1 M in 2020/21 based on the current formula for the water dividend, plus phase in of a wastewater dividend based on 0.25% of the wastewater rate base and a phase in of a stormwater dividend based on 0.25% of the stormwater rate base.

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 $3 M (2.6%) to $118 M from $115 M. Water Services operating expenses are projected to increase by $0.9 M, Wastewater Service by $1.7 M, and Stormwater Services by $0.4 M. Many categories of expense are increasing at a rate greater than CPI, particularly depreciation which is 23% of total operating expenses and is increasing at 9.2% compared to 2019/20 as a result of increasing capital investments.

Figure 13 – Budget Operating Expense Summary

	Actual 2018/19	Approved Budget 2019/20	Proposed Budget 2020/21	$ / % Variance (year-over-year) 2019/20	2020/21	Total
Water	**$22,168**	**$24,822**	**$24,595**	**$2,654** *12.0%*	**($228)** *-0.9%*	**$2,426**
Wastewater/ Stormwater	**$36,576**	**$38,247**	**$39,039**	**$1,671** *4.6%*	**$792** *2.1%*	**$2,463**
Engineering & Informantion Services	**$8,156**	**$8,579**	**$9,204**	**$423** *5.2%*	**$625** *7.3%*	**$1,048**
Regulatory Services	**$3,152**	**$4,081**	**$4,359**	**$929** *29.5%*	**$278** *6.8%*	**$1,207**
Customer Service	**$4,916**	**$5,727**	**$5,413**	**$811** *16.5%*	**($313)** *-5.5%*	**$497**
Administration & Pension	**$7,756**	**$8,547**	**$8,071**	**$792** *10.2%*	**($477)** *-5.6%*	**$315**
Depreciation	**$23,007**	**$25,085**	**$27,429**	**$2,078** *9.0%*	**$2,344** *9.3%*	**$4,422**
TOTAL OPERATING EXPENDITURES	**$105,731**	**$115,088**	**$118,110**	**$9,357** *8.8%*	**$3,022** *2.6%*	**$12,379**

As of March 31, 2019, Halifax Water had an accumulated operating surplus which has enabled a deficit budget in 2019/20; and will be sufficient to fund operations until rates for water and wastewater are increased. The projected operating result at March 31, 2020 is a $3.2 M deficit, and deficits of $15.9 M and $26.2 M are budgeted for 2020/21 and 2021/22.

Halifax Water is targeting maintaining an accumulated operating surplus of 3% - 5% of expenses (operating and non-operating) to mitigate risk and also help smooth timing and impact of rate increases. 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.

Figure 14 – Operating Surplus (Deficit)

Continuity Schedule - Accumulated Surplus (Deficit) on a NSUARB Handbook Basis - which Excludes Pension Accrual	Total	Water	Wastewater	Stormwater
2018/19 Fiscal Year				
Balance, beginning of year	$38,625,906	$14,669,623	$15,487,608	$8,468,674
Operating surplus (deficit) for the year	$1,390,433	$2,760,942	($570,243)	($800,266)
Balance, end of year	$40,016,339	$17,430,565	$14,917,365	$7,668,408
2019/20 Fiscal Year				
Balance, beginning of year	$40,016,339	$17,430,565	$14,917,365	$7,668,408
Projected operating (deficit) for the year	($3,188,925)	$2,374,560	($3,936,644)	($1,626,841)
Projected balance, end of year	**$36,827,414**	**$19,805,125**	**$10,980,721**	**$6,041,568**
2020/21 Fiscal Year				
Balance, beginning of year	$36,827,414	$19,805,125	$10,980,721	$6,041,568
Budgeted operating (deficit) for the year	($15,948,714)	($4,274,512)	($7,842,633)	($3,831,569)
Projected balance, end of year	**$20,878,700**	**$15,530,613**	**$3,138,088**	**$2,209,999**
2021/22 Fiscal Year				
Balance, beginning of year	$20,878,700	$15,530,613	$3,138,088	$2,209,999
Budgeted operating (deficit) for the year	($26,155,637)	($9,179,931)	($11,980,107)	($4,995,599)
Projected balance, end of year	**($5,276,937)**	**$6,350,682**	**($8,842,019)**	**($2,785,600)**

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 currently estimated at 1.08% 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, 2020. Some of these initiatives are on-going, and others are one time in nature. The cost containment initiatives from last year (2018/19), along with amounts of an ongoing nature from 2013/14 to 2017/18 inclusive reflected cost savings of approximately $5.4 M. The inclusion of initiatives from prior years reflects an intentional focus on sustainable results over the long-term. As of December 31, 2019, an additional $107 thousand has been realized.

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 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 indicates satisfaction with Halifax Water's overall service delivery remains high at 96%, consistent with the last two years.

For the first time, questions were included related to stormwater service. Of the 750 surveyed, 44% were aware they receive stormwater service and 83% of those receiving stormwater service were very or generally satisfied.

Other key highlights:

- The ratings for staff promptness have improved
- Most customers believe their water is safe and the quality is high
- Confidence in the safety of water in the Halifax Harbour remains low at 44%
- Residents continue to lack awareness of the source of their municipal tap water
- Awareness of the LSL subsidy is low
- Awareness of the emergency assistance program (H2O Fund) is low
- Over 50% of customers would be interested in rounding up their bill to the nearest dollar with the rounded portion given as a charitable donation to help low income customers in need (this is an initiative being explored to grow the H2O Fund).

Strategic objectives for 2020/21 that will help address some of areas of potential improvement are implementation of the customer portal, enhancements in the Customer Care Centre that will reduce call wait times, and enhanced customer communications particularly around stormwater service. Many initiatives are underway that ultimately will help us continue to enhance service to customers to keep them satisfied.

5.2 Advanced Metering Infrastructure

Halifax Water will complete a multi-year project to install AMI in 2020. 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).

The AMI project is a $25.4 M dollar initiative impacting all customers, by upgrading 85,000 meters and changing how the utility provides service and can interact with customers. By March 31, 2020, there will be approximately 82,000 AMI devices installed.

In addition to streamlining the meter reading process and reducing its cost, AMI enables many features to 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.

- A reduction in billing errors, and elimination of estimated meter readings.

- 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 to manage their water consumption and see the effect of any conservation measures they take through a customer portal

AMI provides more data about customer consumption and distribution system operations. This enables earlier identification of distribution system leaks. Overall, it will improves 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 results in reduced costs for billing and collection, and reduces the need for the high cost activity of sending technicians to customer homes.

The upgrade to AMI has enabled 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.

Strategic objectives in 2020/21 enabled by AMI are implementation of the customer portal, and expanding availability of monthly billing.

5.3 Information Technology Strategic Plan

Halifax Water continues to update its IT Strategic Plan. The business focus is on using progressive technologies to improve organizational efficiency, effectiveness and customer service.

The Strategic Business Drivers shaping the information technology environment have not changed:

- Provide world class services to our customers and our environment
- Retain leadership position as an integrated water, wastewater and stormwater utility
- Retain position as a top utility in all Lines of Business focused on Public and Employee Safety, Water Quality, Sustainable Infrastructure and Asset Renewal, Regulatory Compliance and Growth, and Environmental Stewardship.
- Follow an IRP Framework

Six Strategic Themes characterize the plan:

- **Customer Experience** – Providing customers with the ability to access most services using online services.
- **Information Integration with Location** - Having all necessary data linked together and tracked through a geographic lens.
- **Analytics Driven Decision Making** – Being able to model customer usage, financial, environmental, and infrastructure data across the Water, Wastewater and Stormwater systems and having the capability to tie data together into business intelligence.
- **Managed Knowledge and Workflow** – Capturing and storing key content in a logical and easy to access place for those who need it.
- **Enable Employees Anywhere** – Providing functionality for employees to access, capture and update the information they need to effectively do their job and support others, wherever they may be working.
- **Secure IT Foundation** – Effectively managing the IT function and providing infrastructure that is resilient, cost-effective, well supported, and recoverable within clearly defined requirements.

The IT Strategy Five-Year Roadmap 2020/21 is a high-level snapshot of the sequence of programs to deliver on the approved technology vision and recommended architecture. The plan has an estimated total cost of $28,000,000.

Projects currently underway include:

- New payroll system
- Customer portal
- Water quality data management and reporting
- Permitting approvals

- Enterprise Resource Planning (ERP) solution
- GIS and Cityworks enhancements
- Internal website (Intranet)
- Document management pilot in Legal Services
- IT Server Hosting
- IT Security assessment and roadmap
- IT Help Desk software replacement
- Office 365 migration
- Analytics Decision Support System Phase One

Projects due to start in next fiscal year include:

- Impervious Surface Area updates
- Analytics Decision Support System Phase Two
- Full Enterprise Data Warehouse
- Enterprise SharePoint rollout for Document Management
- Disaster Recovery Planning
- Asset Condition

5.4 Wet Weather Management

Halifax Water maintains approximately 1,000 km of wastewater mains, 300 km of combined sewer mains, 14 wastewater treatment facilities, and 166 wastewater pumping stations. Like many municipalities and utilities across North America, Halifax Water's wastewater collection system is subject to dramatic flow increases in response to precipitation events due to age, historical construction practices, maintenance, number of connections as well as other factors. These Inflow & Infiltration (I&I) flows can lead to wastewater releases, sewer backups/basement flooding, increased operation and maintenance costs, 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 wet weather management program (WWMP). The WWMP is a strategic program to address the negative impacts of wet weather on the wastewater collection system and treatment facilities. The WWMP monitors flows within priority sewersheds before and after wet weather flow reduction activities, while separating the combined sewer systems when practical to do so. The program is long-term in nature and follows a phased implementation approach to meet objectives.

The negative impacts of wet weather can generally be managed by the following:

1. Peak flow reduction - Reduce the quantity of wet weather generated flows that are collected, pumped and treated by the wastewater collection and treatment systems.

2. Peak flow attenuation - Store wet weather generated flows during wet weather periods and release & treat the flows when the system has capacity.

3. System capacity increase

The WWMP intends to systematically identify opportunities to employ the most cost-effective wet weather management strategy. Where possible, all three methods are considered based on a cost benefit analysis and the sewershed specific driver for flow reduction, with regulatory compliance being the highest priority. By reducing wet weather flows, the wastewater system will see a reduction in untreated discharges to the environment, effluent noncompliance at WWTFs, operational and maintenance costs, and an increase in available system capacity.

I&I is grouped into two sources, public infrastructure (mains, manholes, laterals up to the property line, etc.) and private infrastructure (laterals from property line up to and including connections within buildings). The program employs a variety of strategies to reduce wet weather impacts such as pipe condition assessments, cured in place pipe (CIPP) rehabilitation, sewer separation, flow monitoring, illegal connection investigations, public communications, and modeling. To effectively address all the issues that contribute to the impacts of wet weather, multiple business units within Halifax Water are engaged to work together to achieve the goals of the WWMP. Figure 15 indicates the working relationships and activities between the contributing business units.

Figure 15 – Contributing Business Activities of the Wet Weather Management Program

A phased approach is being followed to implement the program. While the phasing is prescriptive; it is important to revisit the objectives of the program periodically and adjust where necessary.

- **Phase I:** The initial phase of the WWMP involved initiation and development of the program. It was quickly realized that strategies would have to be implemented within each priority sewershed based on individual system characteristics. The program's initial 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 implementation team.

- **Phase II:** Phase II of the program required identifying priority sewersheds that demonstrated a need for wet weather management. In the absence of measured flow data, pump station run time data was used to develop a sewershed prioritization matrix. Since that time, significantly more flow monitoring data is available and has almost negated the need for pump station run time data.

- **Phase III:** Pilot sewersheds were identified from the prioritization matrix from Phase II. These pilots were selected so that specific wet weather management strategies could be assessed. Each pilot sewershed was evaluated using pre and post rehabilitation flow data and a cost benefit analysis was conducted with respect to actual wet weather flow reductions. Post rehabilitation flows continue to be monitored in the pilot sewersheds to confirm wet weather flow reductions are achieved long-term.

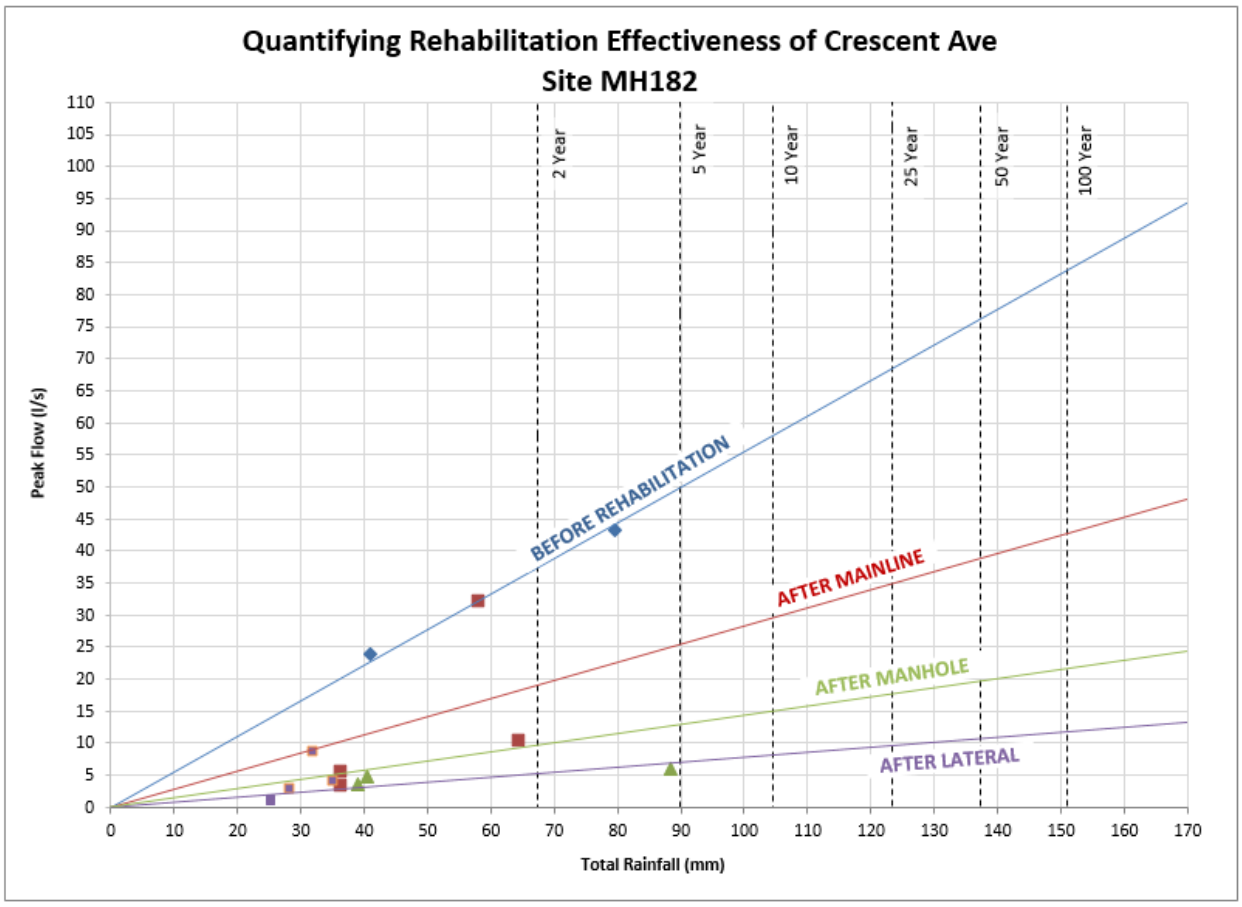
- **Phase IV:** With the information collected from pilot and other wet weather reduction projects, future project recommendations are being identified and implemented in other sewersheds. This approach allows Halifax Water to identify the most cost-effective strategies to manage wet weather flows using system-specific historical data. Since the initiation of the program, 205 sewersheds have been identified with varying degrees of impacts from wet weather.

Recognizing the importance of flow monitoring and infrastructure condition assessments, Halifax Water enhanced the service delivery of the flow monitoring and CCTV programs. Both programs have performance-based contracts to ensure accurate and dependable data delivery to the industry standard.

The near term (2020/2021) goals for Halifax Water's Wet Weather Management Program include:

1. **Rehabilitation Pilot Projects:** Halifax Water's WWMP has completed 5 pilot projects: Stuart Harris Pump Station 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. Wet weather management strategies for these sewersheds included mainline, manhole, and lateral CIPP, new stormwater mains, and system spot repairs. 2020/21 will see continued flow monitoring and data analysis on pre and post activity for each pilot. As an example, Figure 16 below illustrates the reduction in rainfall derived inflow and infiltration (RDII) peak flow for the Crescent Ave pilot project. This pilot underwent a three-phase rehabilitation including mainline, manhole, and lateral renewal activities.

Figure 16 – Quantifying Rehabilitation Effectiveness



2. **Refinement of Cost Benefit Analysis:** Phase IV of the WWMP involved applying a cost benefit analysis of the various strategies to manage wet weather flows. As expected, the pilot sewersheds are demonstrating a significant reduction in RDII as the various wet weather management strategies are implemented. The financial cost of the RDII reduction was normalized so that the information can be applied to other sewersheds and compared to more traditional approaches to wet weather management such as capacity increase and storage. Additional data from various sewersheds is continually analyzed as it becomes available. In addition to flow data, cost information is available for application to larger scale rehabilitation projects.

   The cost and reductions in RDII have been compiled since the inception of the formalized WWMP. The program is structured to evaluate all wet weather management activities using the same methodology to ensure consistent application across identified areas. This enables Halifax Water to employ the most cost-effective strategy to future areas. It has become evident that the RDII reduction cost has significant dependence on the sewershed characteristics; however, it provides essential guidance for the future projects. The Program continues to augment this information and its application to future projects.

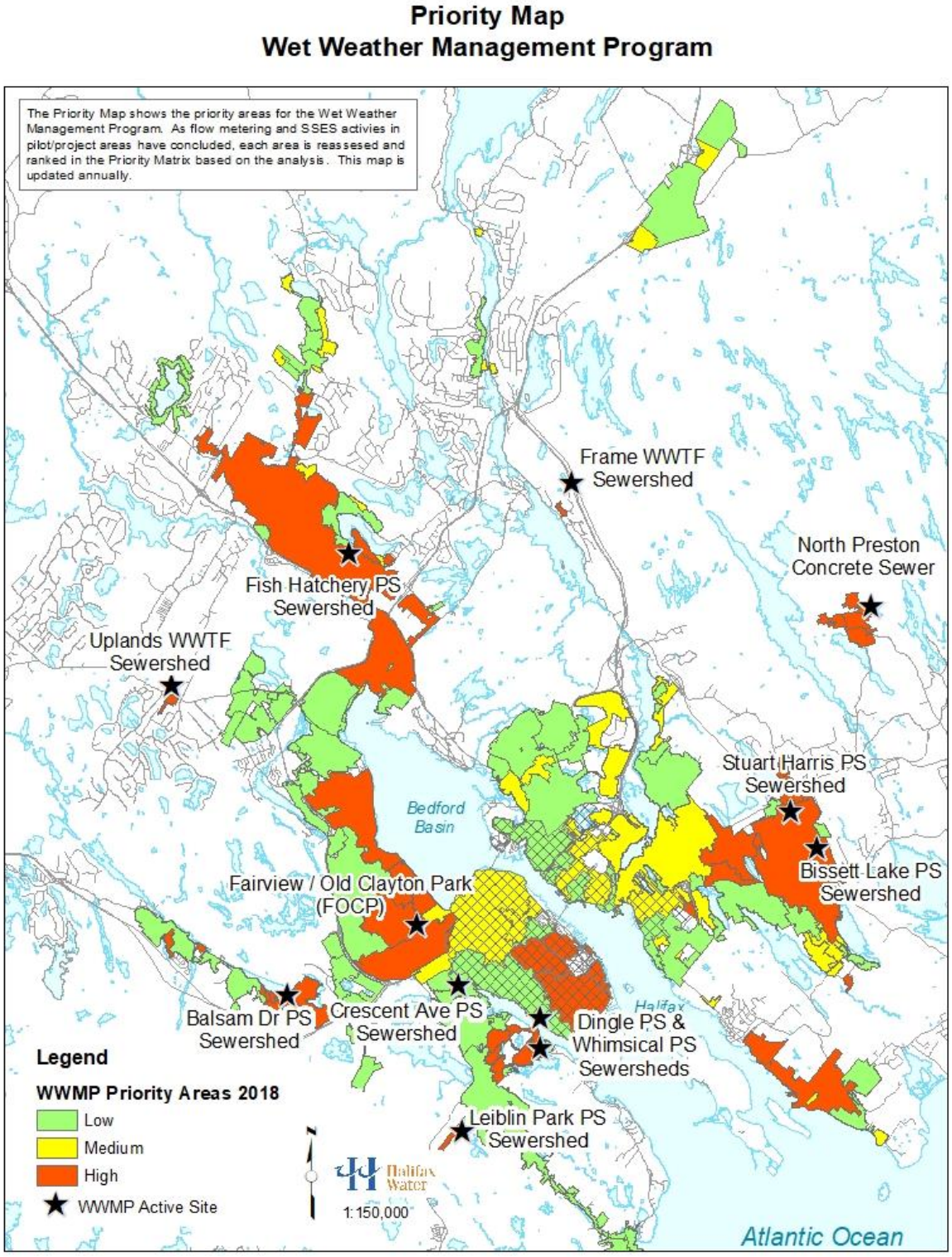
3. **Fairview / Old Clayton Park / Bridgeview:** The analysis of flow monitoring data undertaken as part of the West Region Wastewater Infrastructure Plan identified the potential for significant reductions in RDII in the Fairview, Old Clayton Park and Bridgeview areas. With the goal of reducing peak flows by approximately 200 L/s, a phased I&I reduction program was initiated in 2017. In 2018/19, approximately 11 km of CIPP lining was completed as part of Phase I and 2019/20 Phase 2 will see approximately 15 km completed. 2019/20 included smoke testing with the goal of identifying both public and private inflow sources. Flow monitoring and data analysis will continue to quantify RDII reductions for the project area and assess the effectiveness of the asset renewal during all phases of the project.

4. **Program Expansion: Central and East Region Infrastructure Master Plan:** Work on the Infrastructure Master Plan for the East and Central regions has been completed in 2019. Wet weather flow management is a part of the overall wastewater strategy for the Infrastructure Master Plan (IMP). The WWMP will continue to work with the IMP project team in strategy selection for management of wet weather flows. In 2020/21, the WWMP will continue with SSES (Sanitary Sewer Evaluation Survey) activities in the Fish Hatchery Park Pump Station and Eastern Passage sewersheds with the goal of identifying the sub-sewersheds where implementation of wet weather projects are considered feasible.

5. **Decision Matrix Implementation:** Building on the past experience with WWMP projects; an enhanced prioritization methodology is being developed with the addition of a decision matrix to assist in identifying areas that can benefit from wet weather management in a cost-effective manner. The decision matrix provides a process flow framework to prioritize candidate sewersheds for future rehabilitation projects.

Figure 17 below shows current sewershed priority ranking based on a previous methodology. Beginning in 2020/21, the WWMP is updating the sewershed prioritization methodology by incorporating recommended criteria to refine priority areas going forward.

Figure 17 – Wet Weather Management Program Priority Map



The planned WWMP activities for the next year are listed in Figure 18 below:

Figure 18 – Wet Weather Management Activities for 2020/21

2020/2021
Refresh Prioritization Matrix
SSES Activity (CCTV, Smoke Testing & Flow Monitoring)
Fish Hatchery PS Sewershed (FMZ07 & FMZ10) *Hornes Rd Sewershed - Private-side Pilot Project (FMZ37)* *Eastern Passage Sewersheds (FMZ37)* *Loon Lake Sewersheds (FMZ24)*
Rehabilitation: Capital Projects
Fairview/Old Clayton Park/Bridgeview - Phase III

5.5 Resource Recovery

The WWTF upgrades at Aerotech, Eastern Passage and installation of dewatering equipment at Mill Cove WWTF has strengthened Halifax Water's capacity to dewater sludge from its facilities. Additionally, Halifax Water has been successfully working with Nova Scotia Environment for elimination of the permitting requirements to dewater sludge at various facilities. These initiatives have provided required flexibility thereby reducing the risk of a dewatering facility malfunction and as a result the overall plant operational risks have reduced.

The Biosolids Processing Facility (BPF) is operated by Walker Environment Group with overall responsibility for operating the facility to produce a soil amendment in conformance with Canadian Food Inspection Agency (CFIA) regulations and marketing the product for beneficial reuse. The current asset management plan developed in cooperation with the contractor addresses the parts replacement/upgrade needs of the facility. The BPF is also approaching its design capacity. With population growth and the improvement in performance of treatment plants, the WWTFs are producing an increased quantity of sludge. The contract agreements with Walker Environmental expires at the end of March 2021. Staff are currently reviewing the overall operation, while simultaneously working on the capacity upgrade requirements and a new operating contract. The future BPF could utilize completely different technology with a different operating contractor. In light of the recent industry trends with focus on resource recovery from Biosolids, Halifax Water is exploring all aspects of resource recovery when considering alternatives for biosolids processing. Since this will potentially be a long-term contract, there is a medium level risk with potential changes, considering the complexities associated with the management of biosolids.

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 and assist with regulatory compliance. It also makes day to day operations more sustainable and engages employees in these operational activities. The EMS program can be audited against ISO 14001 standards, and if found to comply, receives a Certification through ISO. The ISO standard changed from a 2004 version to a 2015 version, with greater focus placed on organizational leadership and identification of risks and the associated influences, both internal and external to an organization.

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.

Staff have successfully obtained certification for the existing facilities, Pockwock, Lake Major and Bennery Water Treatment Facilities and the Herring Cove and Dartmouth WWTFs under the new Standard. Halifax Water is currently preparing for internal audits for Eastern Passage, Halifax and Mill Cove WWTFs. It is anticipated they will be certified in 2020.

A request for proposal closed in November and a Consultant will be in place by January 2020 to develop the framework for a corporate wide EMS program. It is anticipated the implementation of a corporate EMS will be completed by 2022. Expansion of the EMS program presents a significant opportunity to reduce Halifax Water's environmental footprint.

5.7 Energy Management and GHG Reduction

Halifax Water has a mature Energy Management Program, and 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 delivers energy efficiency initiatives that have resulted in annual reductions of 2 – 4% per year since inception. The focus of this Committee is being broadened to include more emphasis on GHG emission reduction, and developing specific targets and actions for Halifax Water that will support HalifACT 2050. HalifACT 2050 is a long-term climate change plan to reduce emissions and help communities adapt. 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 2020/21 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:

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

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.

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

The HalifACT 2050 program initiated by the municipality identifies the Cogswell District Energy System as a significant climate change mitigation opportunity. 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, HRM has completed amendments to its Charter through 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 strategic objectives related to DEC in 2020/21 include enactment of a mandatory connection by-law by the municipality, confirming that the service will be regulated by the NSUARB, finalizing the business case, and securing necessary Halifax Water Board and NSUARB approvals to proceed.

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 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.

Halifax Water published its third WQMP in September 2017 and it was subsequently approved by the Halifax Water Board. The WQMP guides Halifax Water's water quality work and also guides the research chair. There are four themes in the current WQMP as follows:

1. **Understanding Lake Recovery:** As indicated above, lake recovery is a process whereby improved air quality and the reduction on acid rain is allowing lakes to recover to their previous state. Unfortunately, this process has resulted in increasing levels of total organic carbon (TOC) which is a critical treatment parameter and increasing levels of biotic activity in the lakes. The increasing levels of biotic activity are an explanation for the geosmin episodes experienced since 2012. Increasing levels of biotic activity are also a potential precursor to other taste and odour causing compounds as well as potentially harmful algal toxins such as microcystsin-LR. As well, the increasing levels of TOC are challenging the ability of the water supply plants to operate efficiently and may eventually reach levels beyond what the plants were designed to deal with. Plant improvements will be required in the medium term and understanding how far the process of lake recovery will go is necessary to design the plant processes of the future.

2. **Adapting to Lake Recovery:** As indicated above, lake recovery is already impacting the treatment plants. While treated water quality still meets Halifax Water goals, the plants are more difficult and more expensive to operate. Short and medium term strategies and operating approaches are necessary to continue to produce high quality drinking water. This includes planning for a new intake for Lake Major to get access to more treatable and more consistent water quality as well as maximizing the utilization of biofiltration.

3. **Maintaining Distribution System Water Quality:** Maintaining water quality between the water treatment plant and the customer's tap is an important part of the multiple barrier approach to providing safe drinking water. Continuing our research into lead occurrence and corrosion control chemistry will remain a focal point. This theme will also explore maintaining water quality during emergencies such as water main breaks and continuing to optimize disinfection in the distribution system to maintain chlorine residuals while reducing disinfection by-products.

4. **Water Quality Data Mining:** Ten years of research and source water protection work has resulted in an immense resource of water quality data. New resources recruited as part of the LSL Program include a data analyst whose long-term responsibility will be to work with water quality data sets to gain new insights into water quality issues and employ data analytics techniques for processes like distribution system water quality modelling.

***for*Water Network**

In 2015, Halifax Water was asked to participate in an application by researchers at the University of Waterloo and the University of Alberta in an application to NSERC for a $5 M network grant. The purpose of the network is to bring forest ecology researchers from across Canada to share ideas on how to manage forests to protect drinking water quality.

The network grant was awarded in 2016 and unites 7 research platforms across Canada, including Dalhousie University. Halifax Water staff participate in the network in addition to hosting research on our watersheds. Research in Halifax is focusing on how climate change impacts the transfer of naturally occurring carbon from the forest to water, where the carbon levels impact the treatment process.

We expect this program to have a major influence on watershed management in coming years.

5.9 Lead Service Line Replacement Program

One significant new program that has grown out of water quality master planning has been the adoption of a formal LSL replacement program. Halifax Water has approximately 2,500 LSLs remaining in the public right of way and up to 3,500 remaining on private property. In 2017, Halifax Water initiated a program intended to remove all LSLs by 2050, consistent with the recommendation made to the USEPA by the National Drinking Water Advisory Council (NDWAC). In 2019, the Halifax Water Board approved an enhanced program that will see all LSLs replaced by 2039 or earlier, subject to NSUARB approval.

Halifax Water is one of a few utilities in Canada to adopt a NDWAC based approach to LSL replacement. This approach is consistent with industry association policy, is consistent with the safeguarding of public health, and positions Halifax Water well from increased public attention to the lead issues arising from the new Health Canada guideline.

The program has the following five pillars:

1. **Replace all LSLs by 2039**, both those owned by the utility and those owned by customers. Program enhancements approved by the Halifax Water Board in 2019, if approved by the NSUARB, will remove remaining barriers to private LSL replacement.

2. **Inventory:** Getting an accurate inventory of where LSLs are, both public and private is key to working with customers and executing an effective program. Resources and new business process will be dedicated to building an accurate inventory of LSLs. This portion of the program has been very successful to date. Several record sources have been consolidated and confidence is improving in existing records. Halifax Water is working toward an industry best practice of an online inventory tool for customer access.

3. **Customer communication:** The NDWAC recommendations require direct communication with customers who have a LSL, a minimum of once every three years until the LSL is removed. Further, to encourage customers to replace LSL's, it will be necessary to provide more information on our web site and interactive tools to see what type of service they have. It will also be necessary to provide them more frequent and better information on the replacement process, how to access funding programs, how to hire a contractor and the health risks associated with LSL's.

4. **Continuation of customer sampling programs:** Sampling properly for lead detection is expensive and intrusive for the customer. It is important that Halifax Water continue to offer free lead sampling for at risk homeowners in order to engage them in the issue and provide public health information. Through our partnership with Dalhousie University we have been able to provide very cost-effective lead sampling.

5. **Corrosion control:** Providing corrosion control treatment at the treatment plant is an important part of a comprehensive lead strategy. Effective corrosion control reduces lead levels where service lines exist and will continue to protect customers from lead found in solder and brass fixtures well after LSLs are removed.

Halifax Water launched its new lead program on April 1, 2017. In August 2017, the NSUARB approved a program to enable Halifax Water to provide a 25% rebate for customers replacing a LSL and to replace LSLs that are disturbed during emergency repairs, at the utilities expense. This makes Halifax Water one of the first utilities in North America to take this step. To further reduce barriers to replacement, Halifax Water has applied to the NSUARB to allow Halifax Water to offer customers a financing program for the balance of the replacement cost. This financing program was approved in 2018.

In the first two years of the program, 197 public LSL's and 212 private LSL's were replaced. Unfortunately, in 2019 we saw a reduction in uptake in the program. Based on discussions with other utilities across North America, this appears to be a common phenomenon, as motivated customers participate in the program in the early years leaving less motivated customers in later years.

Accordingly, Halifax Water will be exploring further regulatory and incentive options to promote LSL replacement and anticipates an application to the NSUARB in 2020.

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.

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

Halifax Water is a signatory of the Nova Scotia Health and Safety Leadership Charter which represents a commitment from industry leaders across Nova Scotia to the continuous growth of a positive workplace safety culture. Mental health and psychological health and safety are increasingly being recognized as an important component of occupational health

and safety. In 2020/21 Regulatory Services and Human Resources will be working together to further psychological health and safety initiatives and all Halifax Water employees will receive psychological health and safety training.

To enhance the safety culture, Safety Audits are being conducted both on Halifax Water Operation projects and the Capital Infrastructure Program, where Halifax Water engages third party contractors. The outcomes are being used as guidance on improvements to safety policies and training initiatives. Halifax Water continues to advance our Contractor Safety Program which will include improved contract language, orientation and monitoring pertaining to job site safety.

In 2020, to assist with the management of the safety program, it is proposed to review the applicability of the ***ISO 45001*** International Standard that specifies requirements for an occupational health and safety (OH&S) management system, with guidance for its use, to enable an organization to proactively improve its OH&S performance in preventing injury and ill-health.

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.

Halifax Water tracks safety indicators as part of the Corporate Balance Scorecard, which is described in Section 6.

There have been improvements in the safety indicators over the past two years, and a new metric was added in 2019/20 - the average score on internal safety audits. It is hoped that the inclusion of this metric and the continued focus on the internal safety audit program will continue to elevate the safety culture at Halifax Water.

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.

The strategic objectives for 2020/21 include an audit of physical security.

Vulnerability: Facility assessments are conducted 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 Compliance Plan

The Regulatory Compliance division of Regulatory Services has established a tracking system to monitor trends of non-compliance and associated sources for all of the wastewater treatment facilities (WWTF). A working group has been established between Asset Management, Operations and Design Services staff to track and plan for the upgrades to maintain compliance with Provincial and Federal regulations. As of 208/19, all treatment facilities are in compliance with WSER or have approval for operational variances consistent with the CCME Municipal Wastewater Effluent Strategy.

Building on the framework of the basic Compliance Plan from 2012, the plan was updated in 2019 utilizing information Halifax Water has available to create a path forward to maintain or achieve compliance for our wastewater, water and stormwater infrastructure systems over the next 30 years. The Compliance Plan highlights the current state of compliance at our wastewater treatment facilities and water supply plants as well as future compliance requirements. It also includes overall guidance on our wastewater collection system, sanitary and combined sewer overflows and our water distribution system including water reservoirs.

The key objectives of the Compliance Plan included:

- Review of previous work completed that relates to compliance, including the 2012 IRP, 2019 Infrastructure Master Plan and Five-Year Capital Program;
- Understanding current and future compliance requirements as they relate to wastewater, water and stormwater infrastructure;
- Understanding previous compliance trends and exploring potential compliance requirements taken from regional and global examples;
- Reviewing, documenting and analyzing the current performance of infrastructure against compliance requirements;
- Generation of infrastructure needs and costs to meet current and future compliance requirements;
- Incorporating the three drivers behind infrastructure planning (growth, asset management and compliance) through incorporating the impact of future growth trends and outlining projects that contain compliance components and asset renewal / growth components;
- Developing an action plan that outlines current, medium and long-term projects; and
- Identification of action plan risks and potential mitigation methods.

Halifax Water has been consistently working toward achieving the provincial level of wastewater treatment as stipulated by Nova Scotia Environment (NSE) permits and Federal Wastewater System Effluent Regulations (WSER). Historically, NSE has set compliance standards for each WWTF issuing Approval for Operation which sets the effluent limits, and the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CSMMW) provided national standards for combined sewer overflows (CSO) and sanitary sewer overflows (SSO). Then in June 2012, the WSER was enacted which set national standards for WWTF effluent discharge and CSO and SSO standards.

Since the introduction of the federal WSER standards, NSE has been reviewing and renewing Halifax Water's operating permits with steady increases in compliance and reporting requirements.

The Compliance Plan is a key input to the Infrastructure Resource Plan (IRP). The IRP provides holistic guidance to understand the current level of compliance and actions required for maintaining compliance. Several initiatives have recently been completed and others underway shall continue. Current compliance initiatives are as follows:

- Compliance Monitoring and Reporting through the Regulatory Services Department;
- Engaging Dalhousie University in compliance research;
- Adopting the Environmental Management System (EMS);
- Environmental Risk Assessments (ERA); and
- WSER Transitional Authorization.

Halifax Water has entered into a 3-year research agreement with Dalhousie University to conduct specific research and optimization of Halifax Water facilities to stay "ahead of the curve" to meet its compliance requirements. The research program is eligible for funding under NSERC's Collaborative Research and Development Grant, an application to NSERC was made in spring 2019; the approval is pending. The NSERC is in the midst of redesigning its funding programs, Halifax Water and Dalhousie University intend to make a future application for a long-term funding when the new programs are in place. The current 3-year plan has a primary objective to improve effluent quality from chemically enhanced primary systems through bench, pilot and full scale testing and optimization of coagulation/flocculation processes; the other elements being the application of innovative UV technologies and assessment of contaminants of emerging concern

5.12 Asset Management

Asset Management Plans (AMPs) have been established by Halifax Water and asset management (AM) efforts are now focused 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 in 2020/21 are outlined below.

Asset Management initiatives for 2020/21 include:

- Update the Asset Management Plan (annual)
- Continue the AMITs for three asset classes
- Support the RDC and Water and Wastewater Rate applications. Continue the driveway culvert data collection project
- Continue annual flow monitoring and sewer inspection programs
- 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

2020/21 will see staff continue implementation of three Asset Management Implementation Teams (AMITs) for three asset classes. 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.

Staff will continue with the annual sewer inspection condition assessment program using conventional closed circuit television (CCTV) technology. During 2019 staff explored market interest and capabilities for continuing with zoom inspection technology for gathering condition information of the sewer networks. Efforts to streamline the way staff are able to share the outputs from the inspections will continue through 2020/21. The annual flow monitoring program will also continue in 2020/21.

5.13 Integrated Resource Plan

An updated IRP was completed in 2019. The IRP Update built on the previous studies to address three primary drivers: growth (Infrastructure Master Plan), asset renewal (AMPs), and regulatory compliance (Compliance Plan). This project reviewed existing supply and demand side management activities Halifax Water has done or could do to optimize service delivery, created a six-step program integration approach, and produced a comprehensive 30-year capital investment program.

Several important initiatives aimed at filling data gaps have been completed or initiated since the first IRP in 2012. These included:

- Implementing the Wet Weather Management Program (with inflow and infiltration reduction pilot projects);
- Continuing the implementation of the Asset Management Program (foundational elements from the AM Roadmap);
- Resolving asset attribute information gaps in GIS, and carrying out specific inventory and condition assessment projects;
- Developing Asset Management Plans (AMPs) by asset class;
- Implementing the Corporate Flow Monitoring Program;
- Implementing the Sewer Inspection Program (using closed circuit television (CCTV) inspection methods);
- Completing the Hydraulic Modelling Assessment and Strategy;
- Completing the West Region Wastewater Infrastructure Plan (WRWIP);
- Completing the Infrastructure Master Plan.

The Infrastructure Master Plan project is the latest undertaking towards data and knowledge gap completion. The Infrastructure Master Plan looked at growth requirements for the balance of the wastewater infrastructure planning (east and central regions), included the program developed in the WRWIP, and included a water infrastructure plan for all regions. The project also included a climate change assessment and a policy component to develop a climate change adaptation plan and a systems optimization plan. The project enables Halifax Water to streamline prior long-term planning initiatives to facilitate regular, holistic Infrastructure Master Plan updates on a five-year cycle for water and wastewater infrastructure.

The IRP update was completed in November 2019 and incorporates findings from work completed or planned to support the drivers of regulatory compliance, asset renewal, and growth. The IRP update features a review of demand and supply side management activities Halifax Water has been or could be involved in. Further, it uses a systematic approach to reviewing integration opportunities for outputs of the predecessor plans (Compliance Plan, AMPs, Infrastructure Master Plan).

The resulting IRP Update recalibrates the long-term investment to an estimated $4.1 billion over 30 years with and anticipated review as part of Halifax Water's long-term planning cycle every 5 years. Several key initiatives have been identified to support the next IRP update.

5.14 Enterprise Risk Management

In 2019 Halifax Water completed an Enterprise Risk Management (ERM) Framework, and the Halifax Water Board approved an ERM Policy, and a risk appetite and tolerance matrix. There are seven broad risk categories outlined in the policy, which align very closely to the Corporate Balanced Scorecard critical success factors. The risk categories and critical success factors may both change over time. In future, there will be consideration of the alignment. The more closely the risk categories and critical success factors align the less opportunity there will be for confusion or goal misalignment.

The ERM Policy will be rolled out in 2020, and Halifax Water will begin risk based reporting to the Halifax Water Board. It will take 2 – 3 years to fully embed ERM at Halifax Water; and an additional resource is required to coordinate enterprise risk management, and well as internal audit functions. Compliance with policies and standard operating procedures (SOPs) is important to help manage risk. Halifax Water will add capacity to conduct internal audits with a focus on promoting policy and SOP compliance.

Some of the most significant risks facing Halifax Water relate to infrastructure, therefore there are financial risks also - insufficient revenues to meet the projected operating requirements, and insufficient capital funding to meet the IRP recommended level of spend.

5.15 Regional Development Charge

The Halifax Water RDC is a fee payable at the building permit stage of a new development to fund regional water and wastewater infrastructure expansion requirements related to growth. The RDC was approved in 2014 and provides fairness across the rate base ensuring current customers do not subsidize new growth and development.

When the RDC rates were approved, Halifax Water committed to update the RDC on a five-year cycle, or mid-cycle if any of the assumptions used in determining the RDC impact the value of the charge by +/- 15%. No mid-cycle adjustment was required. Since approving the RDC, Halifax Water has completed a more detailed Infrastructure Master Plan, for water and wastewater infrastructure, to be used as inputs to the updating of the RDC.

In 2017 and 2019, Halifax Water conducted formal and informal stakeholder consultation on the updated RDC. The proposed updates were presented to the Halifax Water Board on October 2019, and the subsequent application was submitted to the NSUARB in November 2019. There is a Hearing scheduled for March 2020.

It is necessary to increase the RDC rates to reflect the new, comprehensive infrastructure master plan. At the time of the RDC approval in 2014, Halifax Water did not have all the components of a water system master plan. Since 2014, and in keeping with the NSUARB's requirement to update the RDC after five years, Halifax Water has completed a comprehensive infrastructure master plan. The master plan includes the first consolidated thirty year plan for water infrastructure.

The updates included current population forecasts, people per unit, the unit type ratios, design per capita consumption values, standardized costing and benefit to existing frameworks.

Money collected from the RDC funds upgrades and improvements to the regional wastewater and water systems that are required to accommodate growth anticipated within the Municipality's Regional Plan. There is no RDC for stormwater. The infrastructure requirements were identified through the Infrastructure Master Plan with growth related costs estimated at $212 M for wastewater and $165 M for water, based on a 20 year growth horizon. In keeping the outcomes of the initial application, the infrastructure costs were adjusted to reflect a 20 year growth horizon, with the post period benefits being tracked for the next five-year update.

5.16 Talent Management

Halifax Water uses the term talent management to describe our strategic workforce management activities to ensure we have the right people in the right places, at the right time, and at the right price to execute the business of the utility.

Figure 19 – Talent Management Cycle

In 2018/19, Halifax Water engaged an external consultant to review Halifax Water's succession planning, and processes to develop staff. In 2019/20 Halifax Water implemented some of the recommendations from the report. Some examples include new performance appraisal forms for non-union staff, and investment in an on-line training platform; and promotion of the existing Training and Life Long Learning programs.

In 2020, we will be focusing on building a feedback culture, as one major finding of the report was that employees would like more feedback on how they are doing. This is consistent with employee survey results. Providing feedback is one of the most important roles of a supervisor. All managers and supervisors will be trained to increase their skill and comfort with providing feedback. Additionally, in 2020/21 new managers and supervisors will participate in Halifax Water's supervisory training program "Performance Matters".

5.17 Employee Satisfaction

Each year Halifax Water engages an external consultant to conduct an employee survey. The overall rating in 2019 has increased to a B+ (3.8) from a B. The corporate balance scorecard target is an A- (4.0)

There were three areas where satisfaction improved by more than 10%:

- Being kept informed about important changes (up 14%)
- Halifax Water is interested in the well-being of its employees (up 10%)
- Feeling passionate about working at Halifax water (up 10%)

There are five areas where Halifax Water has showed some improvement, but is below the norm compared to other employers in Atlantic Canada. These will be areas that Halifax Water will examine for potential improvement in 2020/21.

- Employees understanding how they can meet personal performance targets
- Employees feeling a sense of accomplishment from their work
- Employees believing senior leadership are approachable
- Employees feeling their workplace reflects diverse cultural communities
- Employees feeling a high level of commitment to employer

In 2020/21, an action plan will be developed and implemented to respond to the 2019 employee survey results. The next survey will be conducted in November 2020.

6. PERFORMANCE MEASUREMENT

At the end of the 2020/21 fiscal year, Halifax Water's overall performance will be assessed against the Corporate Balanced Scorecard (CBS). Halifax Water has been utilizing a corporate balanced scorecard (CBS) to measure utility performance since 2001. Each year the Halifax Water Board sets organizational indicators and reviews performance results. The CBS targets for 2020/21 will be presented for approval at the March 2020 meeting of the Halifax Water board, prior to the start of the new fiscal year on April 1, 2020.

There are eight Critical Success Factors (CSFs) derived from Halifax Water's vision statement (shown in Appendix A) and under each of the CSFs, there are organizational indicators to track performance and allow for the establishment of targets. The following lists the current CSFs and corresponding results for the organizational indicators under each category.

1. High Quality Drinking Water

- Adherence with Water Quality Master Plan - Percentage of sites achieving targets
- Bacteriological tests - Percentage free from Total Coliform
- Customer satisfaction about water quality - Percentage from customer survey

2. Service Excellence

- Customer satisfaction with service - Percentage from customer survey
- Water service outages - Number of connection hours/1000 customers
- Wastewater service outages – Number of connection hours/1000 customers
- Average speed of answer – Percentage of calls answered within 20 seconds

3. Responsible Financial Management

- Operating expense/revenue ratio percentage
- Annual cost per customer connection – Water
- Annual cost per customer connection – Wastewater

4. Effective Asset Management

- Water leakage control – target leakage allowance of 160 litres/service connection /day
- I&I reduction - Number of inspections on private property for discharge of stormwater into the wastewater system
- Peak flow reduction from wet weather management capital projects
- Hours of unplanned outages in GIS and Cityworks
- Capital budget expenditures - Percentage of budget spend by end of fiscal year

5. Workplace Safety and Security

- Average score on internal safety audits
- NS Labour and Advanced Education compliance - # of Incidents with written compliance orders
- Lost time accidents -Number of accidents resulting in lost time per 100 employees
- Safe driving - Number of traffic Accidents per 1,000,000 km driven
- Training - Number of employees trained or re-certified before due date
- Percentage of completed safety talks

6. Regulatory Compliance

- Percentage of public health and environmental regulatory infractions resulting in an environmental warning report, summary offense ticket, ministerial order, or prosecution
- Percentage of WWTFs complying with NSE approval permits

7. Environmental Stewardship

- Number of ICI properties inspected by Pollution Prevention each year
- Energy management kwh/m^3 reduction associated with capital projects
- Bio-solids residual handling - % of sludge meeting bio-solids concentration targets

8. Motivated and Satisfied Employees

- Percentage of grievances resulting in arbitration
- Percentage of jobs filled with internal candidates
- Employee satisfaction survey result
- Average number of days absenteeism

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 where:

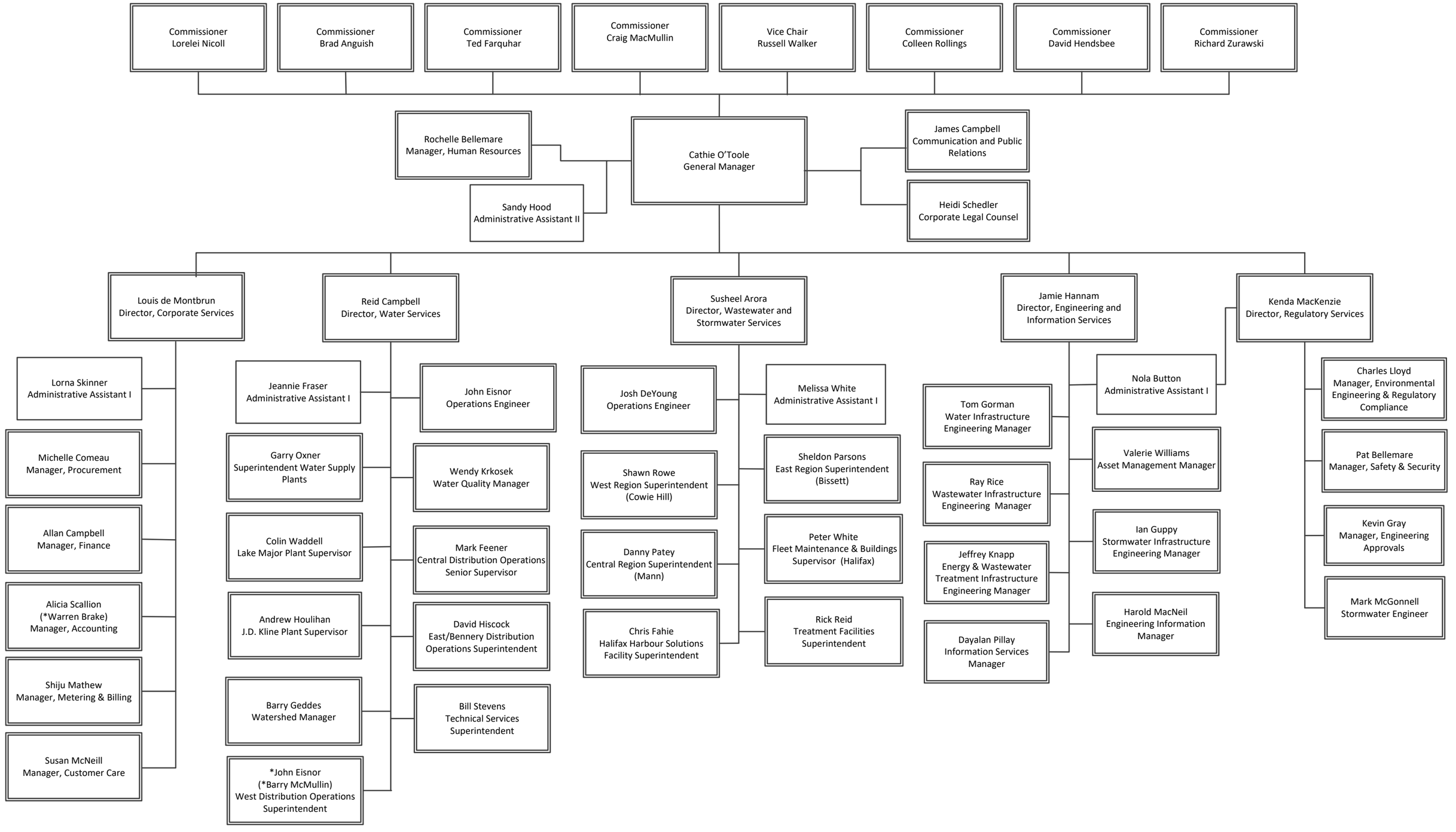
- *All Interactions are respectful, courteous, and civil*
- *We respect confidentiality of people and transparency of process*
- *We have an inclusive environment*
- *We lead by example*
- *We are positive and collaborative*
- *We treat employees and customers equitably*
- *We have a safe, accessible work environment*
- *We are accountable for our actions & behaviours*

Appendix B

Organizational Structure

STRAIGHT from the SOURCE

HALIFAX WATER ORGANIZATIONAL STRUCTURE



January 2020

Appendix C

2020/21 Capital Budget

STRAIGHT from the SOURCE

HALIFAX WATER

Capital Budget 2020/21

Summary

Asset Category	Project Costs
Water - Land -- T O T A L	$100,000
Water - Transmission -- T O T A L	$10,453,000
Water - Distribution -- T O T A L	$5,277,000
Water - Structures -- T O T A L	$10,980,000
Water - Treatment Facilities -- T O T A L	$15,129,000
Water - Energy -- T O T A L	$200,000
Water - Security -- T O T A L	$50,000
Water - Equipment -- T O T A L	$103,000
Water - Corporate Projects - T O T A L	$6,637,500
TOTAL - Water	**$48,929,500**

Wastewater - Trunk Sewers -- T O T A L	$500,000
Wastewater - Collection System -- T O T A L	$14,473,000
Wastewater - Forcemains -- T O T A L	$825,000
Wastewater Structures -- T O T A L	$8,415,000
Wastewater - Treatment Facility -- T O T A L	$5,525,000
Wastewater - Energy -- T O T A L	$75,000
Wastewater - Security -- T O T A L	$200,000
Wastewater - Equipment -- T O T A L	$255,000
Wastewater - Corporate Projects -- T O T A L	$8,180,000
TOTAL - Wastewater	**$38,448,000**

HALIFAX WATER

Capital Budget 2020/21

Summary

Asset Category	Project Costs
Stormwater - Pipes -- T O T A L	$2,380,000
Stormwater - Culverts -- T O T A L	$3,107,000
Stormwater - Structures -- T O T A L	$1,900,000
Stormwater - Corporate Projects -- T O T A L	$1,749,500
TOTAL - Stormwater	**$9,136,500**

G R A N D T O T A L	**$96,514,000**

HALIFAX WATER

Capital Budget 2020/21

Water

Project Number	Project Name	Project Cost
	Water - Land	
3.033	Watershed Land Acquisition	$100,000
	Water - Land -- T O T A L	**$100,000**
	Water - Transmission	
3.042	Critical Valve Replacement Program	$300,000
3.503	Chain Control Valve Upgrade Program	$45,000
3.581	Transmission Main Monitroing System Pilot	$200,000
3.549	Chain Control Transmission - Peninsula Low Upsize - Design	$100,000
3.552	Chain Control Transmission - Peninsula Intermediate Upsize - Design	$100,000
3.564	Herring Cove Road Looping-McIntosh Street	$228,000
3.568	Tacoma PRV Chamber	$420,000
3.291	Port Wallace Transmission Main - Main Street to Caledonia Road	$6,000,000
3.554	North End Feeder Replacement - Design	$200,000
3.399	Cogswell Interchange - Water Transmission Main Realignments	$2,850,000
3.045	Bedford West CCC - Various Phases	$5,000
3.261	Lakeside Timberlea CCC	$5,000
	Water - Transmission -- T O T A L	**$10,453,000**
	Water - Distribution	
3.022	Water Distribution - Main Renewal Program	$3,525,000
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	$300,000
3.501	South Street CN Bridge Watermain Installation	$25,000
3.296	Water Sampling Station Relocation Program	$10,000
3.513	Meadowbrook PRV Chamber - Replace PRV Valves	$35,000
3.569	Fall River Rechlorination Station	$25,000
3.573	Spring Garden Road - Main Renewal - Design	$37,000
	Water - Distribution -- T O T A L	**$5,277,000**

HALIFAX WATER

Capital Budget 2020/21

Water

Project Number	Project Name	Project Cost
	Water - Structures	
3.512	Eaglewood Pumping Station - New Pump Control Panel	$35,000
3.514	Steel Reservoir Climbing Systems - Safety Upgrades	$225,000
3.116	Bedford South (Hemlock) Reservoir CCC	$10,160,000
3.309	Cowie Hill Reservoir Replacement - Design	$200,000
3.515	Meadowbrook Reservoir Overflow Pipe Replacement	$70,000
3.517	Mount Edward Control Chamber - Extension of Power Supply	$20,000
3.523	Lake Major Dam - Site Improvements	$240,000
3.528	Beaver Bank Booster Station - Pump Upgrades	$30,000
	Water - Structures -- T O T A L	**$10,980,000**
	Water - Treatment Facilities	
	J D Kline Water Supply Plant:	
3.541	JD Kline WSP - Process Upgrades - Phase 1 - New Clarifier and Pre-Treatment	$1,475,000
3.542	JD Kline WSP - Process Upgrades - Phase 1 - Backwash Optimization	$1,700,000
3.543	JD Kline WSP - Process Upgrades - Phase 1 - Building Improvements	$110,000
3.141	JD Kline WSP - Raw Water Valve Actuators Replacement	$100,000
3.428	JD Kline WSP - Caustic Tank Liner Replacements	$25,000
3.465	JD Kline WSP - Low Lift Pump Replacements	$1,120,000
3.351	JD Kline WSP - Replace Westinghouse Electrical Panels	$8,000
3.530	JD Kline WSP - Alum Tank Liner Replacement	$45,000
3.531	J D Kline WSP - New Ultrasonic Level Transmitter	$10,000
3.472	JD Kline WSP - Replace Floc Tank Valve Actuators	$35,000
3.374	J D Kline WSP - Replace Filter Isolation Gates Program	$300,000
	Lake Major Water Supply Plant:	
3.532	Lake Major WSP - Phase 1 - Temporary Side Stream	$3,320,000
3.533	Lake Major WSP - Phase 1 - New Clarifiers and Pre-Treatment	$1,770,000
3.534	Lake Major WSP - Phase 1 - Filtration System Replacement	$370,000
3.535	Lake Major WSP - Phase 1 - Raw Water Pump Station	$265,000
3.536	Lake Major WSP - Phase 1 - Building Additions	$184,000
3.162	Lake Major WSP - Butterfly Valve Replacement Program	$350,000
3.507	Lake Major WSP - New Boat Launch	$42,000

HALIFAX WATER

Capital Budget 2020/21

Water

Project Number	Project Name	Project Cost
3.321	Lake Major WSP - Replace Fluoride Tank and Piping	$250,000
3.557	Lake Major WSP - Sludge Drying Beds Improvements	$500,000
3.526	Lake Major WSP - Roof Replacement	$400,000
3.560	Lake Major WSP - Emergency Pumps - Sitework Preparations	$320,000
3.524	Lake Major WSP - Fuel Storage for Generator at Low Lift Station	$135,000
	Bennery Lake Water Supply Plant:	
3.477	Aerotech Booster Station Capital Upgrades	$200,000
3.488	Bennery Lake WSP - Surge Anticipator Valves Replacement	$100,000
3.486	Bennery Lake WSP - Access Road Upgrade	$1,500,000
	Non-Urban Core WSP	
3.582	Bomont Equipment Upgrade	$150,000
3.518	Pump Replacement Program - Small Systems	$45,000
3.455	Reservoir Mixing and Residuals Management Upgrade Program	$300,000
	Water - Treatment Facilities -- T O T A L	**$15,129,000**
	Water - Energy	
3.221	Energy Management Capital Program (Water)	$100,000
3.107	Chamber HVAC Retro-Commissioning Program	$100,000
	Water - Energy -- T O T A L	**$200,000**
	Water - Security	
4.009	Security Upgrade Program	$50,000
	Water - Security -- T O T A L	**$50,000**
	Water - Equipment	
3.101	Miscellaneous Equipment Replacement	$50,000
3.502	Leak Detection Equipment	$8,000
3.516	Purchase Hydraulic Saws	$45,000
	Water - Equipment -- T O T A L	**$103,000**
	Water - Corporate Projects - T O T A L	**$6,637,500**
	GRAND TOTAL - WATER	**$48,929,500**

HALIFAX WATER

Capital Budget 2020/21

Wastewater

Project Number	Project Name	Project Cost
	Wastewater - Trunk Sewers	
2.822	Odour Level of Service and Optimization Review	$100,000
2.584	Fairview Cove Trunk Sewer - Design	$400,000
	Wastewater - Trunk Sewers - -- T O T A L	**$500,000**
	Wastewater - Collection System	
2.052	Integrated Wastewater Projects - Program	$2,000,000
2.168	Wastewater System - Trenchless Rehabilitation Program	$3,000,000
2.838	Albro Lakes Watershed Separation	$811,000
2.841	Local Network Upgrades on Beaver Bank Road - Design	$176,000
2.692	Cogswell Redevelopment - Sewer Relocation	$1,000,000
2.557	Punch Bowl PS Elimination	$100,000
2.746	Sewer Relocation at South Street CN Bridge	$450,000
2.437	Hines Road Rider Sewer Extension	$80,000
2.357	Manhole Renewals WW	$25,000
2.358	Lateral Replacements WW (non tree roots)	$1,720,000
2.563	Lateral Replacements WW (tree roots)	$541,000
2.223	Wet Weather Management Program	$350,000
2.074	Bedford West Collection System CCC	$39,000
2.836	Wyse Road Separation Phase 1	$386,000
2.672	Young Street - Sewer Separation	$100,000
2.674	South Park Street - Sewer Separation	$3,270,000
2.679	College Street - Sewer Separation	$100,000
2.526	Prince Albert Road Sewer Separation - Side Streets	$325,000
	Wastewater - Collection System -- T O T A L	**$14,473,000**
	Wastewater - Forcemains	
2.823	Akerley Blvd Forcemain Replacement	$65,000
2.819	Pumping Station Oil Tank Replacements	$60,000
2.82	Morris Lake Forcemain Investigation and Rehabilitation	$500,000
2.608	New Timberlea Pump Station Forcemain System - Design	$200,000
	Wastewater - Forcemains -- T O T A L	**$825,000**

HALIFAX WATER

Capital Budget 2020/21

Wastewater

Project Number	Project Name	Project Cost
	Wastewater - Structures	
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
2.818	Jamieson Pumping Station - Automatic Bar Screen	$60,000
2.853	Fairfield Holding Tank - Concept Design	$150,000
2.824	Bruce Street Pumping Station Relocation	$150,000
2.827	Wastewater Pumping Station Generator Plug/Switch Installations	$125,000
2.825	First Lake Pumping Station Upgrades	$70,000
2.654	PS Control Panel / Electrical Replacement	$725,000
2.829	Armscrest Pumping Station - Piping and Valve Upgrades	$71,000
2.005	Autoport Pleasant Street PS Replacement	$3,000,000
2.66	Bissett PS Component Upgrade	$50,000
2.655	Roach's Pond PS Component Upgrade	$550,000
2.093	Windmill Road PS Replacement	$1,355,000
2.665	CSO Upgrade Program	$300,000
2.459	William's Lake PS Rehabilitation	$100,000
2.74	Duffus PS CSO - Modification	$100,000
2.846	Upgrade Quigley's Corner Pumping Station	$287,000
2.847	Optimize Quigley's Corner Pumping Station	$22,000
2.609	New Timberlea Pumping Station - Design	$400,000
	Wastewater Structures -- T O T A L	**$8,415,000**
	Wastewater - Treatment Facility	
2.056	Plant Optimization Audit Program	$125,000
2.522	Emergency Wastewater Treatment Facility equipment replacements	$400,000
2.668	Wastewater Research Program Pilot Plant	$300,000
2.849	HSPs - OCS H2S Analyzers	$60,000
2.701	HHSP - OCS Wet Scrubber Chlorine Analyzers	$60,000

HALIFAX WATER

Capital Budget 2020/21

Wastewater

Project Number	Project Name	Project Cost
	Halifax Wastewater Treatment Facility:	
2.532	Duct Work Replacement	$50,000
2.765	Raw Water Pump Refurbishment	$50,000
2.767	Fixed Gas Meters - Replacement	$150,000
2.768	New Coagulant Dosing System	$100,000
2.769	New Polymer Dosing System	$40,000
2.77	Sludge Pumps - New Mechanical Seals	$60,000
2.706	Densadeg Hydraulic Optimization	$100,000
2.772	Grit System - Parts Replacements and New Screws	$50,000
2.776	Sludge Dewatering - Fournier Press Upgrades	$50,000
2.773	Industrial Water System Replacement	$50,000
	Dartmouth Wastewater Treatment Facility:	
2.502	Duct Work Replacement	$50,000
2.781	Fine Screens - New Perforated Plate Screens	$1,800,000
2.783	New Coagulant Dosing System	$100,000
2.784	New Polymer Dosing System	$40,000
2.707	Densadegs - CFD Analysis and Flow Diversion Vanes	$110,000
2.785	Heat Exchangers - Refurbishment	$40,000
2.787	Sludge Pumps - New Mechanical Seals	$60,000
2.791	Desadegs - Lamella Tube Settler Replacements	$300,000
2.850	Ballasted Flocculation Pilot	$75,000
2.855	Industrial Water System Replacement	$50,000
	Herring Cove Wastewater Treatment Facility:	
2.639	Duct Work Replacement Program	$50,000
2.794	Spare Sludge Tank mixer	$25,000
2.795	Sludge Pumps - New Mechanical Seals	$40,000
2.796	New Coagulant Dosing System	$30,000
2.797	Heat Exchangers - Refurbishment	$40,000
2.798	Waste Oil System - New Waste Oil Tank	$15,000
2.799	Electrical System - Spare Transfer Switch	$40,000
2.856	Industrial Water System Replacement	$50,000

HALIFAX WATER

Capital Budget 2020/21

Wastewater

Project Number	Project Name	Project Cost
	Eastern Passage Wastewater Treatment Facility:	
2.646	Secondary Launder Covers	$150,000
	Aerotech Wastewater Treatment Facility:	
2.809	Road Rehabilitation	$25,000
2.81	Bioreactors - Short Circuiting Modifications	$200,000
2.811	Lab - HVAC Modifications	$75,000
2.812	Centrifuge - Rebuild	$50,000
	Timberlea Wastewater Treatment Facility:	
2.816	Grit System - Chain and Bucket Replacement	$50,000
	Community Wastewater Treatment Facilities:	
2.761	Springfield Lake - Driveway Replacement	$15,000
	Biosolids Processing Facility:	
2.857	Building Upgrades	$250,000
2.732	Conveyor CS1 Liners	$30,000
2.733	Biofilter Media	$50,000
2.815	Dryer Upgrades	$70,000
	Wastewater - Treatment Facility -- T O T A L	**$5,525,000**
	Wastewater - Energy	
2.65	HHSP - BAS + HVAC Recommissioning	$50,000
2.651	NSPI Meter Relocations	$25,000
	Wastewater - Energy -- T O T A L	**$75,000**
	Wastewater - Security	
4.008	Security Upgrade Program	$200,000
	Wastewater - Security -- T O T A L	**$200,000**
	Wastewater - Equipment	
2.161	I&I Reduction (SIR) Program Flow Meters and Related Equipment	$25,000
2.451	Miscellaneous Equipment Replacement	$120,000
2.821	Duffus Strees PS Flow Meter Replacement	$110,000
	Wastewater - Equipment -- T O T A L	**$255,000**
	Wastewater - Corporate Projects -- T O T A L	**$8,180,000**
	GRAND TOTAL - WASTEWATER	**$38,448,000**

HALIFAX WATER

Capital Budget 2020/21

Stormwater

Project Number	Project Name	Project Cost
	Stormwater - Pipes	
1.038	Integrated Stormwater Projects - Program	$1,000,000
1.102	Manhole Renewals SW	$15,000
1.103	Catchbasin Renewals SW	$60,000
1.135	Lateral Replacements SW	$12,000
1.145	Sullivan's Pond Storm Sewer System Replacement - Phase 2 Irishtown Rd to Harbour	$25,000
1.034	Raymond Street, Phase 2 - Storm Sewer Rehabilitation	$100,000
1.188	Cogswell Redevelopment - SW Sewer Relocation	$955,000
1.201	Stormwater Pipe Condition Inspections (CSP)	$50,000
1.223	Rocky Lake and Bedford Highway Intersection Storm Sewer Upgrade	$75,000
1.224	Thistle Street Storm Drainage System Upgrade - Preliminary Engineering	$50,000
1.227	Stormwater System Upgrade near Civic #1681 Waverley Road	$38,000
	Stormwater - Pipes -- T O T A L	**$2,380,000**
	Stormwater - Culverts/Ditches	
1.104	Driveway Culvert Replacements	$1,200,000
	Street Specific Culvert Replacements:	
1.214	KIPAWA CRESCENT	$400,000
1.125	CORONET AVENUE DRIVEWAY CULVERT REPLACEMENT PROJECT	$925,000
1.147	COLE HARBOUR ROAD, near civic 1560	$350,000
1.183	ST MARGARET'S BAY ROAD, near civic 2797	$80,000
1.228	BLUE FOREST LANE, near civic 42	$38,000
1.229	DEVIL'S HILL ROAD at BOULDERBROOK LANE	$38,000
1.231	31 KETCH HARBOUR RD, near civic 832	$38,000
1.232	WAVERLEY ROAD, near civic 832	$38,000
	Stormwater - Culverts/Ditches -- T O T A L	**$3,107,000**
	Stormwater - Structures	
1.225	Ellenvale Run Retaining Wall - Phase 4	$1,900,000
	Stormwater - Structures -- T O T A L	**$1,900,000**
	Stormwater - Corporate Projects -- T O T A L	**$1,749,500**
	GRAND TOTAL - STORMWATER	**$9,136,500**

HALIFAX WATER

Capital Budget 2020/21

Corporate Projects

Project Number	Project Name	Project Cost
	Corporate - Information Technology	
4.097	Analytics Decision Support System	$335,000
4.111	Asset Condition	$125,000
4.151	Capital Planning	$100,000
4.083	Computerized Maintenance Management System (CMMS) Enhancements	$1,000,000
4.011	Desktop Computer Replacement Program	$350,000
4.146	Disaster Recovery	$630,000
4.147	Document Management Sharepoint Rollout	$300,000
4.126	Full Enterprise Data Warehouse	$200,000
4.012	Network Upgrades	$280,000
4.121	New Payroll System	$230,000
4.048	SAP Rate Structure Support	$220,000
4.15	Enterprise Resource Planning Solution	$2,630,000
4.107	Customer Portal	$50,000
4.152	Security Projects	$300,000
	Corporate - Information Technology -- T O T A L	**$6,750,000**
	Corporate - GIS	
4.04	GIS Data Program	$100,000
4.115	GIS Data Build - Services (ICI)	$150,000
4.01	Sewer Service Entry	$250,000
4.116	GIS Data Project (CAD schematic retirement)	$150,000
4.038	GIS Hardware/Software Program	$50,000
4.039	GIS Application Support Program	$150,000
4.059	Utility Network Modeling/Data Modeling	$50,000
4.118	Engineering Drawing Database	$100,000
4.155	Stormwater Billing Imagery Acquisition and Analysis	$350,000
	Corporate - GIS -- T O T A L	**$1,350,000**
	Corporate - Asset Management	
2.523	Wastewater Sewer Condition Assessment	$215,000
1.156	Storm Sewer Condition Assessment	$95,000
2.043	Corporate Flow Monitoring Program	$1,870,000

HALIFAX WATER

Capital Budget 2020/21

Corporate Projects

Project Number	Project Name	Project Cost
4.113	Vulnerability to Climate Change Risk Assessment-Asset Class Pilot	$250,000
2.562	Outfall Assessment Project	$20,000
4.14	SSO Management Program	$100,000
4.141	System Constraints Analysis HRM (was East Additional Flow Monitoring)	$252,000
4.143	Safe Yield Study	$200,000
4.144	New Hydraulic Model (infoWater)	$200,000
4.145	Transmission Main Risk Assessment and Prioritization Framework	$50,000
	Corporate - Asset Management -- T O T A L	**$3,252,000**
	Corporate - Facility	
2.176	East/Central Regional Operational Facility	$2,000,000
4.077	Building Capital Improvements	$185,000
3.221	Energy Management Capital Program	$100,000
	Corporate - Facility -- T O T A L	**$2,285,000**
	Corporate - SCADA & Other Equipment	
4.093	GPS Units - Replacement	$70,000
4.004	SCADA Control System Enhancements	$100,000
4.136	ICS Cyber Security Enhancements	$100,000
4.137	Halifax Harbour Solutions Radio Upgrade	$60,000
4.138	Wastewater Community Plants SCADA System Relocation	$45,000
4.139	PI System Enhancements	$100,000
4.154	Customer Meters - New and Replacement	$500,000
	Corporate - SCADA & Other Equipment -- T O T A L	**$975,000**
	Corporate - Fleet	
4.006	Fleet Upgrade Program Stormwater	$269,000
4.006	Fleet Upgrade Program Wastewater	$1,076,000
4.007	Fleet Upgrade Program Water	$610,000
	Corporate - Fleet -- T O T A L	**$1,955,000**
	GRAND TOTAL - Corporate Projects	**$16,567,000**

	ALLOCATION BREAKDOWN:	
	Water - Corporate Projects - T O T A L	$6,637,500
	Wastewater - Corporate Projects -- T O T A L	$8,180,000
	Stormwater - Corporate Projects -- T O T A L	$1,749,500
	GRAND TOTAL - Corporate Projects	**$16,567,000**

HALIFAX WATER

Capital Budget 2020/21

Summary of Routine Capital Expenditures included within Capital Budget

Project Number	Project Name	Project Cost	Asset Class
3.067	Valves Renewals	$125,000	Water
3.068	Hydrants Renewals	$75,000	Water
3.069	Service Lines Renewals	$100,000	Water
3.390	Lead Service Line Replacement Program	$1,000,000	Water
3.101	Miscellaneous Equipment Replacement (W)	$50,000	Water
4.007	Fleet Upgrade Program Water	$610,000	Water
2.357	Manhole Renewals WW	$25,000	Wastewater
2.358	Lateral Replacements WW (non-tree roots)	$1,720,000	Wastewater
2.563	Lateral Replacements WW (tree roots)	$541,000	Wastewater
2.161	I&I Reduction (SIR) Program Flow Meters and Related Equipment	$25,000	Wastewater
2.451	Miscellaneous Equipment Replacement (WW)	$120,000	Wastewater
4.006	Fleet Upgrade Program Wastewater	$1,076,000	Wastewater
1.102	Manhole Renewals SW	$15,000	Stormwater
1.103	Catchbasin Renewals SW	$60,000	Stormwater
1.135	Lateral Replacements SW	$12,000	Stormwater
4.006	Fleet Upgrade Program Stormwater	$269,000	Stormwater
4.011	Desktop Computer Replacement Program	$350,000	Corporate
4.093	GPS Units - Replacement	$70,000	Corporate
4.154	Customer Meters - New and Replacement	$500,000	Corporate
4.012	Network Upgrades	$280,000	Water & Wastewater
	GRAND TOTAL - Routine Capital Projects	**$7,023,000**	

Appendix D

2020/21 Operating Budget

STRAIGHT from the SOURCE

HALIFAX WATER
CONSOLIDATED SUMMARY OF ESTIMATED REVENUE & EXPENSES
PROPOSED OPERATING BUDGET
APRIL 1, 2020 to MARCH 31, 2021
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	**APPROVED BUDGET ** APR 1/20 MAR 31/21**
OPERATING REVENUE	$138,413	$138,727	**$138,618**
OPERATING EXPENSES	$105,731	$115,088	**$118,110**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$32,682	$23,639	**$20,508**
FINANCIAL REVENUE			
INVESTMENT INCOME	$1,156	$816	**$86**
MISCELLANEOUS	$742	$553	**$532**
	$1,898	$1,369	**$619**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$7,430	$8,181	**$8,823**
LONG TERM DEBT PRINCIPAL	$20,516	$19,822	**$21,880**
AMORTIZATION DEBT DISCOUNT	$199	$202	**$228**
DIVIDEND/GRANT IN LIEU OF TAXES	$4,999	$5,147	**$6,113**
MISCELLANEOUS	$45	$22	**$32**
	$33,190	$33,374	**$37,076**
OPERATING SURPLUS (DEFICIT) AVAILABLE FOR CAPITAL EXPENDITURES	$1,390	($8,366)	**($15,949)**
Less:			
Pension accrual	*($6,208)*	*($5,668)*	*($10,204)*
Operating Deficit on an Accrual Basis	*($4,818)*	*($14,034)*	*($26,152)*

** 2019/20 Operating Budget approved by the Halifax Water Board of Commissioners, January 31, 2019.*
*** 2020/21 Operating Budget approved by the Halifax Water Board of Commissioners, January 30, 2020*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - WATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2020 to MARCH 31, 2021
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	**APPROVED BUDGET ** APR 1/20 MAR 31/21**
OPERATING REVENUE			
METERED SALES	$48,040	$47,744	**$48,069**
FIRE PROTECTION	$7,074	$7,074	**$7,074**
PRIVATE FIRE PROTECTION SERVICES	$869	$873	**$884**
BULK WATER STATIONS	$227	$292	**$303**
CUSTOMER LATE PAY./COLLECTION FEES	$244	$223	**$238**
MISCELLANEOUS	$98	$179	**$177**
	$56,552	$56,387	**$56,746**
OPERATING EXPENSES			
WATER SUPPLY & TREATMENT	$8,516	$9,597	**$9,369**
TRANSMISSION & DISTRIBUTION	$10,014	$11,127	**$11,282**
SMALL SYSTEMS (incl. Contract Systems)	$1,251	$1,237	**$1,221**
TECHNICAL SERVICES (SCADA)	$889	$1,037	**$1,029**
ENGINEERING & INFORMATION SERVICES	$3,749	$3,901	**$4,162**
REGULATORY SERVICES	$679	$1,142	**$1,195**
CUSTOMER SERVICE	$2,524	$2,918	**$2,758**
ADMINISTRATION & PENSION	$3,986	$4,355	**$4,112**
DEPRECIATION	$9,046	$9,955	**$10,993**
	$40,655	$45,270	**$46,121**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$15,898	$11,117	**$10,625**
FINANCIAL REVENUE			
INVESTMENT INCOME	$521	$367	**$39**
MISCELLANEOUS	$559	$431	**$394**
	$1,080	$798	**$432**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$1,924	$2,238	**$3,127**
LONG TERM DEBT PRINCIPAL	$7,181	$5,165	**$6,465**
AMORTIZATION DEBT DISCOUNT	$85	$67	**$84**
DIVIDEND/GRANT IN LIEU OF TAXES	$4,999	$5,147	**$5,654**
MISCELLANEOUS	$24	$12	**$2**
	$14,214	$12,630	**$15,332**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	$2,764	($715)	**($4,275)**

** 2019/20 Operating Budget approved by the Halifax Water Board of Commissioners, January 31, 2019.*

*** 2020/21 Operating Budget approved by the Halifax Water Board of Commissioners, January 30, 2020*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - WASTEWATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2020 to MARCH 31, 2021
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	**APPROVED BUDGET ** APR 1/20 MAR 31/21**
OPERATING REVENUE			
METERED SALES	$69,901	$70,031	**$70,365**
WASTEWATER OVERSTRENGTH AGREEMENTS	$75	$50	**$30**
LEACHATE	$330	$394	**$387**
CONTRACT REVENUE	$87	$86	**$86**
SEPTAGE TIPPING FEES	$764	$760	**$505**
DEWATERING FACILITY/ SLUDGE LAGOON	$210	$210	**$0**
AIRLINE EFFLUENT	$143	$160	**$105**
CUSTOMER LATE PAY./COLLECTION FEES	$186	$164	**$176**
MISCELLANEOUS	$185	$139	**$136**
	$71,881	$71,993	**$71,790**
OPERATING EXPENSES			
WASTEWATER COLLECTION	$11,676	$10,972	**$11,847**
WASTEWATER TREATMENT PLANTS	$18,197	$19,139	**$19,332**
SMALL SYSTEMS	$1,262	$1,323	**$1,239**
DEWATERING FACILITY/ SLUDGE MGM'T	$226	$636	**$404**
BIOSOLIDS TREATMENT	$27	$101	**$101**
LEACHATE CONTRACT	$286	$325	**$337**
TECHNICAL SERVICES (SCADA)	$1,450	$1,784	**$1,652**
ENGINEERING & INFORMATION SERVICES	$3,783	$3,556	**$3,769**
REGULATORY SERVICES	$886	$1,434	**$1,537**
CUSTOMER SERVICE	$2,057	$2,536	**$2,352**
ADMINISTRATION & PENSION	$3,242	$3,606	**$3,405**
DEPRECIATION	$12,986	$13,921	**$15,072**
	$56,079	$59,334	**$61,045**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$15,801	$12,659	**$10,745**
FINANCIAL REVENUE			
INVESTMENT INCOME	$520	$367	**$39**
MISCELLANEOUS	$183	$122	**$139**
	$703	$489	**$178**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$4,939	$5,133	**$4,772**
LONG TERM DEBT PRINCIPAL	$12,015	$12,965	**$13,442**
AMORTIZATION DEBT DISCOUNT	$103	$113	**$124**
DIVIDEND/GRANT IN LIEU OF TAXES	$0	$0	**$398**
MISCELLANEOUS	$21	$10	**$30**
	$17,077	$18,220	**$18,766**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	($573)	($5,072)	**($7,843)**

** 2019/20 Operating Budget approved by the Halifax Water Board of Commissioners, January 31, 2019.*

*** 2020/21 Operating Budget approved by the Halifax Water Board of Commissioners, January 30, 2020*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - STORMWATER OPERATIONS
PROPOSED OPERATING BUDGET
APRIL 1, 2020 to MARCH 31, 2021
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	**APPROVED BUDGET ** APR 1/20 MAR 31/21**
OPERATING REVENUE			
STORMWATER SITE RELATED SERVICE	$5,906	$6,351	**$6,047**
STORMWATER RIGHT-OF-WAY SERVICE	$3,835	$3,835	**$3,835**
CUSTOMER LATE PAY./COLLECTION FEES	$118	$66	**$106**
MISCELLANEOUS	$120	$95	**$92**
	$9,980	$10,347	**$10,081**
OPERATING EXPENSES			
STORMWATER COLLECTION	$4,901	$5,750	**$5,779**
TECHNICAL SERVICES (SCADA)	$49	$39	**$42**
ENGINEERING & INFORMATION SERVICES	$624	$1,122	**$1,273**
REGULATORY SERVICES	$1,587	$1,505	**$1,627**
CUSTOMER SERVICE	$335	$273	**$304**
ADMINISTRATION & PENSION	$527	$586	**$554**
DEPRECIATION	$974	$1,208	**$1,365**
	$8,997	$10,484	**$10,943**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$983	($137)	**($862)**
FINANCIAL REVENUE			
INVESTMENT INCOME	$116	$82	**$9**
MISCELLANEOUS	$0	$0	**$0**
	$116	$82	**$9**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$567	$810	**$924**
LONG TERM DEBT PRINCIPAL	$1,320	$1,692	**$1,973**
AMORTIZATION DEBT DISCOUNT	$11	$22	**$20**
DIVIDEND/GRANT IN LIEU OF TAXES	$0	$0	**$62**
MISCELLANEOUS	$0	$0	**$0**
	$1,899	$2,524	**$2,978**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	($800)	($2,579)	**($3,832)**

** 2019/20 Operating Budget approved by the Halifax Water Board of Commissioners, January 31, 2019.*

*** 2020/21 Operating Budget approved by the Halifax Water Board of Commissioners, January 30, 2020*

HALIFAX WATER
ESTIMATED REVENUE & EXPENSES, SEGREGATED BY REGULATED AND UNREGULATED ACTIVITIES
PROPOSED OPERATING BUDGET
APRIL 1, 2020 to MARCH 31, 2021
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	**APPROVED BUDGET ** APR 1/20 MAR 31/21**
REGULATED ACTIVITIES			
OPERATING REVENUE			
METERED SALES	$117,941	$117,775	**$118,434**
FIRE PROTECTION	$7,074	$7,074	**$7,074**
PRIVATE FIRE PROTECTION	$869	$873	**$884**
STORMWATER SITE RELATED SERVICE	$5,906	$6,351	**$6,047**
STORMWATER RIGHT-OF-WAY SERVICE	$3,835	$3,835	**$3,835**
OTHER OPERATING REVENUE	$1,216	$1,171	**$1,221**
	$136,841	$137,079	**$137,496**
OPERATING EXPENSES			
WATER SUPPLY & TREATMENT	$8,516	$9,591	**$9,363**
TRANSMISSION & DISTRIBUTION	$10,014	$11,127	**$11,282**
WASTEWATER COLLECTION	$11,643	$10,840	**$11,723**
STORMWATER COLLECTION	$4,901	$5,750	**$5,779**
WASTEWATER TREATMENT PLANTS	$18,197	$19,139	**$19,332**
SMALL SYSTEMS	$2,493	$2,534	**$2,431**
SCADA, CONTROL & PUMPING	$2,388	$2,860	**$2,722**
ENGINEERING & INFORMATION SERVICES	$8,156	$8,559	**$9,184**
REGULATORY SERVICES	$3,152	$4,081	**$4,359**
CUSTOMER SERVICE	$4,881	$5,687	**$5,373**
ADMINISTRATION & PENSION	$7,713	$8,456	**$7,972**
DEPRECIATION	$22,989	$25,022	**$27,349**
	$105,043	$113,648	**$116,869**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$31,798	$23,432	**$20,627**
FINANCIAL REVENUE			
INVESTMENT INCOME	$1,156	$816	**$86**
MISCELLANEOUS	$213	$110	**$39**
	$1,369	$926	**$126**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$7,430	$8,166	**$8,807**
LONG TERM DEBT PRINCIPAL	$20,516	$19,802	**$21,860**
AMORTIZATION DEBT DISCOUNT	$199	$202	**$227**
DIVIDEND/GRANT IN LIEU OF TAXES	$4,999	$5,147	**$6,113**
MISCELLANEOUS	$0	$11	**$1**
	$33,145	$33,327	**$37,009**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	$23	($8,970)	**($16,256)**
UNREGULATED ACTIVITIES			
OPERATING REVENUE			
SEPTAGE TIPPING FEES	$764	$760	**$505**
LEACHATE	$330	$394	**$387**
CONTRACT REVENUE	$87	$86	**$86**
DEWATERING FACILITY/ SLUDGE LAGOON	$210	$210	**$0**
AIRLINE EFFLUENT	$143	$160	**$105**
ENERGY PROJECTS	$165	$0	**$0**
MISCELLANEOUS	$38	$38	**$38**
	$1,737	$1,648	**$1,121**
OPERATING EXPENSES			
- DIRECT			
WATER SUPPLY & TREATMENT	$20	$26	**$28**
WASTEWATER COLLECTION	$0	$118	**$111**
WASTEWATER TREATMENT	$572	$1,062	**$842**
SPONSORSHIPS & DONATIONS	$78	$61	**$68**
DEPRECIATION	$18	$62	**$81**
	$688	$1,330	**$1,130**
- INDIRECT (ADMINISTRATION)	$0	$110	**$110**
	$688	$1,440	**$1,240**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$1,049	$207	**($119)**
FINANCIAL REVENUE			
MISCELLANEOUS	$364	$443	**$493**
FINANCIAL EXPENSES			
LONG TERM DEBT INTEREST	$0	$16	**$16**
LONG TERM DEBT PRINCIPAL	$0	$20	**$20**
AMORTIZATION DEBT DISCOUNT	$0	$0	**$0**
MISCELLANEOUS	$45	$11	**$31**
	$45	$47	**$67**
OPERATING SURPLUS AVAILABLE FOR CAPITAL EXPENDITURES	$1,368	$604	**$307**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES - COMBINED ACTIVITIES	$1,390	($8,366)	**($15,949)**

** 2019/20 Operating Budget approved by the Halifax Water Board of Commissioners, January 31, 2019.*
*** 2020/21 Operating Budget approved by the Halifax Water Board of Commissioners, January 30, 2020*