

November 20, 2020

Craig MacMullin, MBA, CPA, CGA, Chair
Halifax Water
Halifax, NS

The regular meeting of the Halifax Water Board will be held on Thursday, November 26, 2020 at 9:00 am. In an effort to stem the spread of COVID19, this meeting will take place via web conferencing and will be available on Halifax Water's website for public viewing following the meeting.

AGENDA

In Camera Reports

- 1C Approval of Minutes of the In-Camera Meeting held on Thursday, September 24, 2020

Motion: That the Halifax Water Board approve the In-Camera minutes of September 24, 2020.

- 2C Business Arising from Minutes
a)

- 3C Land Matter (10 minutes)

Motion: That the Halifax Water Board approve the recommendation as outlined in the confidential report dated November 12, 2020.

- 4C Land Matter (10 minutes)

Motion: That the Halifax Water Board approve the recommendation as outlined in the confidential report dated November 20, 2020.

- 5C-I Security Matter (30 minutes)

Information Item & Presentation.

- 6C-I Regulatory Matter (10 minutes)

Information Item

Regular Reports

1. a) Ratification of In-Camera Motions (2 minutes)

Motion: That the Halifax Water Board ratify the In-Camera Motions.

- b) Approval of the Order of Business and Approval of Additions and Deletions (2 minutes)

Motion: That the Halifax Water Board approve the order of business and approve additions and deletions.

2. a) Approval of Minutes of the Regular Meeting held on Thursday, September 24, 2020 (2 minutes)

Motion: That the Halifax Water Board approve the minutes of the September 24, 2020 regular meeting.

3. Business Arising from Minutes

- a)

Financial

- 4.1 Operating Results for the Seven Months Ended October 31, 2020 (10 minutes)
- 4.2 Update on Status of Capital Projects (15 minutes)
- 4.3 Proposed 2021 Halifax Regional Water Commission Employees' Pension Plan Budget (10 minutes)
- 4.4 Capital Project Funding Approval Policy - Revision (5 minutes)

Motion: That the Halifax Water Board approve the revised Capital Project Funding Approval Policy dated November 18, 2020.

Capital Approvals

- 5.1 Professional Services for Detailed Design and Tender Phase Services (Phase 2) – Burnside Operations Centre (10 minutes)

Motion: That the Halifax Water Board approve funding in the amount of \$810,000 for professional services for the detailed design and tender phase services (Phase 2) of the proposed Burnside Operations Centre for a revised total approved cost to date of \$5,402,000, and an estimated total project cost of \$31,900,000.

- 5.2 Morris Lake/Russell Lake Forcemain Rehabilitation (10 minutes)

Motion: That the Halifax Water Board approve funding for the construction phase of the Morris Lake/Russell Lake Forcemain Rehabilitation project, at an estimated cost of \$2,000,000.

- 5.3 Fairview Cove Trunk Sewer – Construction Phase (10 minutes)

Motion: That the Halifax Water Board approve funding in the amount of \$16,660,000 for the construction phase of the Fairview Cove Trunk Sewer Project for a revised estimated total project cost of \$17,760,000

Other Business

- 6. Code of Conduct Policy (10 minutes)

Motion: That the Halifax Water Board:

1. approve the Code of Conduct Policy, as attached,
2. rescind the Conflict of Interest, Outside Employment, and Gifts Policy #8.17 and the Code of Conduct Policy #8.24, subject to review and approval of the Code of Conduct Policy #8.14 by the Halifax Water Labour Management Committee.

- 7. Appointment of Commissioners to Board Sub-Committees - Verbal (10 minutes)

- 8. 2021/22 Proposed Board & Committee Meeting Dates (5 minutes)

Motion: That the Halifax Water Board approve the schedule of Board and Committee meeting dates for the 2021/2022 fiscal year, as attached.

Information Reports

- 1-I Financial and Operations Monthly Update
- 2-I Capital Budget Approvals to Date – 2020/21
- 3-I Bank Balance
- 4-I Halifax Water Compliance Statement – Quarterly Certification
- 5-I Halifax Regional Water Commission Employees' Pension Plan Financial Report, Third Quarter, 2020
- 6-I Halifax Regional Municipality Master Trust Investment Performance, Second Quarter, 2020
- 7-I Update on COVID-19 Impact on Utility Operations
- 8-I RDC Application Update & Decision Summary
- 9-I 2020/21 Cost Containment Initiatives

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Schedler

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Heidi Schedler
Secretary

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun
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APPROVED: Cathie O'Toole
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Date: 2020.11.20 14:34:00 -04'00'

DATE: November 20, 2020

SUBJECT: Operating Results for the seven months ended October 31, 2020

ORIGIN

Financial Information Reporting.

BACKGROUND

The Halifax Regional Water Commission (Halifax Water) Board is required to review periodic financial information throughout the year.

DISCUSSION

Attached are the operating results for the seven (7) months ending October 31, 2020, with comparative figures for October 31, 2019.

Halifax Water is a fully regulated government business enterprise, falling under the jurisdiction of the NSUARB. The NSUARB requires that Halifax Water file financial statements and rate applications with the NSUARB based on the NSUARB Accounting and Reporting Handbook for Water Utilities (NSUARB Handbook). The Accounting Standards Board (AcSB) requires rate regulated entities to conform to International Financial Reporting Standards (IFRS). Halifax Water maintains the financial records in IFRS for the purposes of the annual audit and consolidation of the financial statements with those of Halifax Regional Municipality (HRM).

The following discussion of the operating results reflect direct operating costs by department and allocations among water, wastewater and stormwater for common costs shared across all the services provided by Halifax Water.

Statement of Financial Position (NSUARB) - Page 3 of attachment

Key indicators and balances from the Statement of Financial Position are provided in the following tables. An analysis of assets is as follows:

	October 31 2020	October 31 2019	March 31 2020	From Prior Year	
				\$ Change	% Change
Assets					
Current					
Cash and cash equivalents	\$ 66,569	\$ 33,034	\$ 49,953	\$ 33,535	101.5%
Receivables					
Customers charges and contractual	14,509	15,128	18,405	(619)	(4.1%)
Unbilled service revenues	19,627	20,001	17,367	(374)	(1.9%)
Halifax Regional Municipality	1,420	0	3,668	1,420	0.0%
Inventory	2,231	1,631	1,736	600	36.8%
Prepays	985	423	1,002	562	132.9%
	105,341	70,217	92,131	35,124	50.0%
Capital work in progress	46,791	68,528	18,104	(21,737)	(31.7%)
Utility plant in service	1,302,804	1,250,383	1,330,147	52,421	4.2%
Total assets	1,454,936	1,389,128	1,440,382	65,808	4.7%
Regulatory deferral account	2,701	2,893	2,812	(192)	(6.6%)
Total assets and regulatory deferral account	\$ 1,457,637	\$ 1,392,021	\$ 1,443,194	\$ 65,616	4.7%

- Cash and cash equivalents consist of cash on hand and balances held within financial institutions reduced by outstanding cheques. It has increased \$33.5 million from the prior year largely due to there being a debenture issue of \$25.0 million in July of the current year and none until the fall of 2019. In addition, HRM has paid the full amount of the stormwater right of way charges, in the prior year the payment was made in two installments.
- Customer charges and contractual receivables have decreased \$0.6 million from the prior year. The change in receivables is driven by the timing of billing cycles, receipt of funding for capital projects, and offset by a decrease in collections due to COVID-19.
- Halifax Regional Municipality net receivables and payables are a receivable balance in the current year due to the debt payment for the Harbour Solutions Project being paid in October of the current year and November in the prior year.
- Inventory has increased \$0.6 million as there was a large purchase of meters in the current year of \$0.5 million as the vendor indicated their prices were increasing.
- The increase in prepaids of \$0.6 million is a result of moving amounts within balance sheet accounts.
- The \$21.7 million decrease in capital work in progress relates to expenditures during the current year of \$28.8 million offset by projects that were capitalized at March 31, 2020. The top five projects in capital work in progress at month end are detailed below:

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Capital Work in Progress	
	Cumulative '000
Bedford South Reservoir	\$ 1,851
Payroll Replacement Project	1,893
Fairview/Clayton Park/Bridgeview Inflow/Infiltration Reduction	1,911
Port Wallace Transmission Main	2,102
Romans & Federal Avenues Sewer Separation	3,280
All other projects	35,754
Net capital work in progress	\$ 46,791

- Utility plant in service assets total \$1.3 billion, an increase of \$52.4 million from the prior year. The increase is a result of additions at year end less depreciation expense and disposals.

The changes in liabilities are presented below:

	October 31 2020	October 31 2019	March 31 2020	From Prior Year	
				\$ Change	% Change
Liabilities					
Current					
Payables and accruals					
Trade	15,415	15,352	28,756	63	0.4%
Interest on long term debt	2,749	2,414	2,139	335	13.9%
Halifax Regional Municipality	0	5,422	0	(5,422)	(100.0%)
Contractor and customer deposits	211	212	197	(1)	(0.5%)
Current portion of long term debt	21,184	24,709	21,184	(3,525)	(14.3%)
Unearned revenue	5,203	4,983	760	220	4.4%
	44,762	53,092	53,036	(8,330)	(15.7%)
Long term debt	213,084	165,664	197,962	47,420	28.6%
Deferred contributions	49,808	48,601	42,604	1,207	2.5%
Total liabilities	307,654	267,357	293,602	40,297	15.1%
Equity					
Accumulated capital surplus	1,096,394	1,063,869	1,094,580	32,525	3.1%
Accumulated operating surplus	42,573	44,459	52,573	(1,886)	(4.2%)
Operating surplus used to fund capital	12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures	(1,364)	3,956	(9,941)	(5,320)	(134.5%)
Total equity	1,149,983	1,124,664	1,149,592	25,319	2.3%
Total liabilities and equity	\$ 1,457,637	\$ 1,392,021	\$ 1,443,194	\$ 65,616	4.7%

- Trade payables and accruals are consistent with the prior year.
- Halifax Regional Municipality net receivables and payables are a receivable balance in the current year due to the debt payment for the Harbour Solutions Project being paid in October of the current year and November in the prior year.
- Current portion of long term debt has decreased primarily as a result of the final payment for debt relating to Lake Major being paid in January 2019 for \$3.7 million.

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- Long term debt increased \$47.4 million. Since October 1, 2019, new debt of \$25.0 million was issued in July 2020 and \$30.0 million was issued in November 2019. Long term debt repayments, since October 2019, have been \$10.8 million.

Debt servicing ratio is a function of total interest and principal payments (including accrued amounts) plus the amortization of debt issue costs divided by total operating revenue per service. Debt servicing ratio by service as at October 31, 2020 is as follows:

Debt Servicing Ratio by Service		
	2020/21	2019/20
Water	12.83%	11.11%
Wastewater	24.66%	23.25%
Stormwater	24.39%	19.82%
Combined	19.78%	18.04%

Total Debt by Service (including current portion)			
	2020/21	2019/20	
Water	\$ 77,894	\$ 59,419	
Wastewater	134,095	117,408	
Stormwater	22,279	13,546	
Combined	\$ 234,268	\$ 190,373	

- The debt servicing ratio for each service has increased from the prior year as a result of the issuance of new debt.
- The debt servicing ratio of 19.78% is below the maximum 35% ratio allowed under the blanket guarantee agreement with HRM.

Statement of Earnings (NSUARB) - Page 4 of attachment

Key indicators and balances from the Statement of Earnings are provided in the following tables:

Summarized Statement of Earnings				
	2020/21	2019/20		
	'000	'000	\$ Change	% Change
Operating revenues	\$ 81,877	\$ 82,749	\$ (872)	(1.1%)
Operating expenditures	64,208	61,855	2,353	3.8%
Earnings (loss) from operations before financial and other revenues and expenditures	17,669	20,894	(3,225)	(15.4%)
Financial and other revenues	472	985	(513)	(52.1%)
Financial and other expenditures	19,505	17,923	1,582	8.8%
Earnings (loss) for the year	\$ (1,364)	\$ 3,956	\$ (5,320)	(134.5%)

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- Operating revenues of \$81.9 million is \$0.9 million lower than the prior year. Details to be discussed further in next section.
- Operating expenditures of \$64.2 million are \$2.4 million higher than the prior year. Details to be discussed on page 6.
- Financial and other revenues of \$0.5 million are \$0.5 million lower than the prior year as a result of the reallocation of interest income to the Regional Development Charge account.
- Financial and other expenditures of \$19.5 million are \$1.6 million higher than the prior year as a result of higher debt servicing costs and an increase in the dividend/grant in lieu of taxes.

Operating revenues are presented below, broken down by type:

Operating Revenues				
	2020/21	2019/20		
	'000	'000	\$ Change	% Change
Consumption revenue	\$ 51,259	\$ 51,900	\$ (641)	(1.2%)
Base charge revenue	19,652	19,537	115	0.6%
Wastewater rebate	(640)	(596)	(44)	7.4%
Metered sales total	70,271	70,841	(570)	(0.8%)
Stormwater site generated charge	3,607	3,585	22	0.6%
Stormwater right of way	2,237	2,237	-	0.0%
Public fire protection	4,127	4,127	-	0.0%
Private fire protection	522	514	8	1.6%
Other operating revenue	1,113	1,445	(332)	(23.0%)
Operating revenue total	\$ 81,877	\$ 82,749	\$ (872)	(1.1%)

Operating revenues have decreased \$0.9 million as compared to the previous year. Key items of note include:

- Water and wastewater consumption are down 0.80% on a volumetric basis as compared to the previous year. This is mainly due to commercial customers who have had to close offices due to COVID-19. Consumption had been budgeted to remain consistent with the prior year.
- Other operating revenue categories are down \$0.3 million. This is a result of a decrease in septage tipping revenues as some haulers have been taking their septage outside of HRM for disposal and not charging interest on overdue accounts as a COVID-19 relief measure.

Operating expenditures are presented below:

Operating Expenditures					
	2020/21	2019/20			
	'000	'000	\$ Change	% Change	
Water supply and treatment	\$ 5,828	\$ 5,435	\$ 393	7.23%	
Water transmission and distribution	6,840	6,349	491	7.73%	
Wastewater collection	8,043	7,579	464	6.12%	
Stormwater collection	2,843	2,938	(95)	(3.23%)	
Wastewater treatment	11,411	11,344	67	0.59%	
Engineering and information services	5,377	5,792	(415)	(7.17%)	
Regulatory services	2,340	2,165	175	8.08%	
Customer services	2,854	3,086	(232)	(7.52%)	
Administration services	3,330	3,472	(142)	(4.09%)	
Depreciation and amortization	15,342	13,695	1,647	12.03%	
	\$ 64,208	\$ 61,855	\$ 2,353	3.80%	

Key items to note:

- Operating expenditures of \$64.2 million are \$2.4 million higher than the prior year. This is a result of the following:
 - Depreciation has increased as a result of additions to utility plant in service at year end.
 - Engineering and information services has decreased due to higher consulting costs in the prior year.
 - Water supply and treatment has increased due to higher chemical costs for polymer and major repair work to raw water pump at the Pockwock facility.
 - Water transmission and distribution has increased mainly due to higher salaries and benefits resulting from the creation of a new superintendent position.
 - Wastewater collection has increased mainly due to higher salaries and benefits as a result of two new full time staff and an increase in materials and supplies purchases.

Pages 5 through 7 of the attachment present the Statement of Earnings by service and the table below is a summary:

Operating Results by Service					
	2020/21	2019/20			
	'000	'000	\$ Change	% Change	
Water	\$ 1,590	\$ 4,266	\$ (2,676)	(62.7%)	
Wastewater	(2,182)	204	(2,386)	(1169.6%)	
Stormwater	(772)	(514)	(258)	50.2%	
Earnings (loss)	\$ (1,364)	\$ 3,956	\$ (5,320)	(134.5%)	

Key items to note:

- Water services earnings of \$1.6 million have decreased from the prior year by \$2.7 million due to the following factors:
 - Decrease in consumption as a result of lower usage by commercial customers.
 - Decrease in late payment fees as a result of COVID-19 relief measures.
 - Increase in operating expenditures mainly due to depreciation of new assets, higher chemical costs, major repair work, and higher salaries and benefits.
 - Increase in financial and other expenditures due to higher debt servicing costs and an increase in the dividend/grant in lieu of taxes paid to HRM.
- Wastewater services loss of \$2.2 million has increased from the prior year by \$2.4 million due to the following factors:
 - Decrease in consumption as a result of lower discharge by commercial customers.
 - Decrease in late payment fees as a result of COVID-19 relief measures.
 - Increase in operating expenditures mainly due to depreciation of new assets and an increase in salaries and benefits offset by a decrease in engineering and information services due to lower consulting costs.
 - Increase in financial and other expenditures due to higher debt servicing costs.
- Stormwater services loss of \$0.6 million has increased from the prior year by \$0.3 million due to the following factors:
 - Increase in operating expenditures mainly due to depreciation of new assets.
 - Increase in financial and other expenditures due to higher debt servicing costs.

Pages 8 through 9 of the attachment present the Statement of Earnings by activity and the table below is a summary:

Results by Activity					
	2020/21	2019/20			
	'000	'000	\$ Change	% Change	
Regulated activities	\$ (1,865)	\$ 3,535	\$ (5,400)	(152.8%)	
Unregulated activities	501	421	80	19.0%	
Earnings (loss)	\$ (1,364)	\$ 3,956	\$ (5,320)	(134.5%)	

Key items to note:

- Regulated activities loss of \$1.9 million has increased from the prior year by \$5.4 million due to the following factors:
 - Decrease in consumption as a result of lower usage by commercial customers.
 - Decrease in late payment fees as a result of COVID-19 relief measures.

- Increase in operating expenditures mainly due to depreciation of new assets and higher salaries and benefits as the result of new staff offset by a decrease in engineering and information services expenditures due to higher consulting costs in the prior year.
- Increase in financial and other expenditures due to higher debt servicing costs and an increase in the dividend/grant in lieu of taxes.
- Unregulated activities are consistent with the prior year.

Results under International Financial Reporting Standards as compared to NSUARB Handbook

As noted previously, the AcSB requires Halifax Water, as a rate regulated utility, to report financial results using IFRS. The NSUARB requires Halifax Water to report in accordance with the NSUARB Handbook. The table below reconciles the results between IFRS and the NSUARB Handbook:

Reconcile IFRS to NSUARB		
	2020/21	2019/20
	'000	'000
IFRS comprehensive earnings	\$ 3,080	\$ 8,554
Add non-cash pension expense	5,953	4,674
Subtract debt principal payments	(11,845)	(10,666)
Add depreciation expense on contributed assets	10,962	10,635
Subtract amortization of contributed capital	(10,962)	(10,635)
Add various depreciation adjustments	1,448	1,394
Subtract OCI gain	-	-
NSUARB earnings (loss)	\$ (1,364)	\$ 3,956

Operating revenues are the same as operating revenues using IFRS and the NSUARB Handbook.

The main differences relate to reporting requirements surrounding the recognition of various expenditures as follows:

- Non-cash pension expense represents the accrued portion of contributions to the pension plan and is not considered an expense for NSUARB Handbook reporting purposes.
- The principle payments on long term debt are recognized as an expense for NSUARB Handbook reporting purposes but are not an expense in IFRS statements.
- Depreciation expense on contributed assets is not an expense for NSUARB Handbook purposes, however, it is offset by the removal of the amortization of contributed capital. IFRS requires contributed capital to be treated as a long term liability and amortized, resulting in higher long term liabilities and lower equity on the statement of financial position.

- The various depreciation adjustments include the add back of losses on the disposal of utility plant in service and IFRS requires componentization of assets and shorter useful lives resulting in higher depreciation than under NSUARB Handbook reporting.

Statement of Earnings and Comprehensive Earnings (IFRS) - Page 2 of attachment

Key indicators and balances from the Statement of Earnings and Comprehensive Earnings are provided in the table below:

Summarized Comprehensive Earnings					
	2020/21		2019/20		
	'000		'000	\$ Change	% Change
Operating revenues	\$ 81,877	\$	82,749	\$ (872)	(1.1%)
Operating expenditures	82,573		78,621	3,952	5.0%
Earnings (loss) from operations before financial and other revenues and expenditures	(696)		4,128	(4,824)	(116.9%)
Financial and other revenues	11,435		11,620	(185)	(1.6%)
Financial and other expenditures	7,659		7,194	465	6.5%
Total comprehensive earnings for the year	\$ 3,080	\$	8,554	\$ (5,474)	(64.0%)

- Operating revenues of \$81.9 million is \$0.9 million lower than the prior year. Details have been discussed in preceding pages.
- Operating expenditures of \$82.6 million are \$4.0 million higher than the prior year. This is a result of the following factors:
 - Increase in depreciation and amortization expense of \$2.0 million as a result of additions to utility plant in service.
 - Increase in accrued pension expense of \$1.3 million as a result of the actuarial revaluation at year end, resulting in a higher estimate for this current fiscal year.
- Financial and other revenues and expenditures have not changed drastically from the prior year, the main increase being the dividend/grant in lieu of taxes increase of \$0.3 million.

ATTACHMENTS

Unaudited Operating Results for the seven (7) months ended October 31, 2020

Report prepared by:

**Alicia
Scallion**

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Alicia Scallion, CPA, CA, Manager, Accounting, (902)-490-4814

HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - IFRS
OCTOBER 31, 2020 (in thousands)

	October 31 2020	October 31 2019	March 31 2020	From Prior Year \$ Change	% Change
Assets					
Current					
Cash and cash equivalents	\$ 66,569	\$ 33,034	\$ 49,953	\$ 33,535	101.5%
Receivables					
Customers charges and contractual	14,509	15,128	18,405	(619)	(4.1%)
Unbilled service revenues	19,627	20,001	17,367	(374)	(1.9%)
Halifax Regional Municipality	1,420	0	3,668	1,420	0.0%
Inventory	2,231	1,631	1,736	600	36.8%
Prepays	985	423	1,002	562	132.9%
	105,341	70,217	92,131	35,124	50.0%
Intangible assets	17,926	14,589	18,951	3,337	22.9%
Capital work in progress	46,791	68,528	18,104	(21,737)	(31.7%)
Utility plant in service	1,252,688	1,207,715	1,281,010	44,973	3.7%
Total assets	1,422,746	1,361,049	1,410,196	61,697	4.5%
Regulatory deferral account	2,701	2,893	2,812	(192)	(6.6%)
Total assets and regulatory deferral account	\$ 1,425,447	\$ 1,363,942	\$ 1,413,008	\$ 61,505	4.5%
Liabilities					
Current					
Payables and accruals					
Trade	15,415	15,352	28,756	63	0.4%
Interest on long term debt	2,749	2,414	2,139	335	13.9%
Halifax Regional Municipality	0	5,422	0	(5,422)	(100.0%)
Contractor and customer deposits	211	212	197	(1)	(0.5%)
Current portion of deferred contributed capital	14,488	13,846	14,488	642	4.6%
Current portion of long term debt	21,184	24,709	21,184	(3,525)	(14.3%)
Unearned revenue	5,203	4,983	760	220	4.4%
	59,250	66,938	67,524	(7,688)	(11.5%)
Deferred contributed capital	876,076	864,373	879,460	11,703	1.4%
Long term debt	213,084	165,664	197,962	47,420	28.6%
Employee benefit obligation	69,260	74,681	63,365	(5,421)	(7.3%)
Total liabilities	1,217,670	1,171,656	1,208,311	46,014	3.9%
Equity					
Accumulated other comprehensive loss	(26,453)	(41,209)	(26,453)	14,756	(35.8%)
Accumulated surplus	234,230	233,495	231,150	735	0.3%
Total equity	207,777	192,286	204,697	15,491	8.1%
Total liabilities and equity	\$ 1,425,447	\$ 1,363,942	\$ 1,413,008	\$ 61,505	4.5%

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS AND COMPREHENSIVE EARNINGS - ALL SERVICES - IFRS
APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21	ACTUAL YEAR TO DATE	From Prior Year	
	THIS YEAR	LAST YEAR	BUDGET	as % of	\$ Change	% Change
	'000	'000	'000	BUDGET		
Operating revenues						
Water	\$ 28,589	\$ 28,730	\$ 48,083	59.46%	\$ (141)	(0.49%)
Wastewater	41,682	42,111	70,365	59.24%	(429)	(1.02%)
Stormwater	5,844	5,822	9,882	59.14%	22	0.38%
Public fire protection	4,127	4,127	7,074	58.34%	0	0.00%
Private fire protection	522	514	884	59.05%	8	1.56%
Other operating revenue	1,113	1,445	2,327	47.83%	(332)	(22.98%)
	81,877	82,749	138,615	59.07%	(872)	(1.05%)
Operating expenditures						
Water supply and treatment	5,828	5,435	10,590	55.03%	393	7.23%
Water transmission and distribution	6,840	6,349	12,311	55.56%	491	7.73%
Wastewater collection	8,043	7,579	13,499	59.58%	464	6.12%
Stormwater collection	2,843	2,938	5,821	48.84%	(95)	(3.23%)
Wastewater treatment	11,411	11,344	21,413	53.29%	67	0.59%
Engineering and information services	5,377	5,792	9,204	58.42%	(415)	(7.17%)
Regulatory services	2,340	2,165	4,359	53.68%	175	8.08%
Customer services	2,854	3,086	5,414	52.72%	(232)	(7.52%)
Administration services	3,330	3,472	8,071	41.26%	(142)	(4.09%)
Pension services	5,953	4,674	10,204	58.34%	1,279	27.36%
Depreciation and amortization	27,754	25,787	41,357	67.11%	1,967	7.63%
	82,573	78,621	142,243	58.05%	3,952	5.03%
Earnings from operations before financial and other revenues and expenditures	(696)	4,128	(3,628)	19.18%	(4,824)	(116.86%)
Financial and other revenues						
Interest	149	618	87	171.26%	(469)	(75.89%)
Amortization of contributed capital	10,962	10,635	13,927	78.71%	327	3.07%
Other	324	367	533	60.79%	(43)	(11.72%)
	11,435	11,620	14,547	78.61%	(185)	(1.59%)
Financial and other expenditures						
Interest on long term debt	4,229	4,158	8,823	47.93%	71	1.71%
Amortization of debt discount	122	105	228	53.51%	17	16.19%
Dividend/grant in lieu of taxes	3,282	2,962	6,114	53.68%	320	10.80%
Other	26	(31)	32	81.25%	57	(183.87%)
	7,659	7,194	15,197	50.40%	465	6.46%
Total comprehensive earnings for the year	\$ 3,080	\$ 8,554	\$ (4,278)	(72.00%)	\$ (5,474)	(63.99%)

HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - NSUARB
OCTOBER 31, 2020 (in thousands)

	October 31 2020	October 31 2019	March 31 2020	From Prior Year \$ Change	% Change
Assets					
Current					
Cash and cash equivalents	\$ 66,569	\$ 33,034	\$ 49,953	\$ 33,535	101.5%
Receivables					
Customers charges and contractual	14,509	15,128	18,405	(619)	(4.1%)
Unbilled service revenues	19,627	20,001	17,367	(374)	(1.9%)
Halifax Regional Municipality	1,420	0	3,668	1,420	0.0%
Inventory	2,231	1,631	1,736	600	36.8%
Prepays	985	423	1,002	562	132.9%
	105,341	70,217	92,131	35,124	50.0%
Capital work in progress	46,791	68,528	18,104	(21,737)	(31.7%)
Utility plant in service	1,302,804	1,250,383	1,330,147	52,421	4.2%
Total assets	1,454,936	1,389,128	1,440,382	65,808	4.7%
Regulatory deferral account	2,701	2,893	2,812	(192)	(6.6%)
Total assets and regulatory deferral account	\$ 1,457,637	\$ 1,392,021	\$ 1,443,194	\$ 65,616	4.7%
Liabilities					
Current					
Payables and accruals					
Trade	15,415	15,352	28,756	63	0.4%
Interest on long term debt	2,749	2,414	2,139	335	13.9%
Halifax Regional Municipality	0	5,422	0	(5,422)	(100.0%)
Contractor and customer deposits	211	212	197	(1)	(0.5%)
Current portion of long term debt	21,184	24,709	21,184	(3,525)	(14.3%)
Unearned revenue	5,203	4,983	760	220	4.4%
	44,762	53,092	53,036	(8,330)	(15.7%)
Long term debt	213,084	165,664	197,962	47,420	28.6%
Deferred contributions	49,808	48,601	42,604	1,207	2.5%
Total liabilities	307,654	267,357	293,602	40,297	15.1%
Equity					
Accumulated capital surplus	1,096,394	1,063,869	1,094,580	32,525	3.1%
Accumulated operating surplus	42,573	44,459	52,573	(1,886)	(4.2%)
Operating surplus used to fund capital	12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures	(1,364)	3,956	(9,941)	(5,320)	(134.5%)
Total equity	1,149,983	1,124,664	1,149,592	25,319	2.3%
Total liabilities and equity	\$ 1,457,637	\$ 1,392,021	\$ 1,443,194	\$ 65,616	4.7%

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - ALL SERVICES - NSUARB
APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21 BUDGET		APR 1/20 MAR 31/21 FORECAST		ACTUAL YEAR TO DATE as % of BUDGET		ACTUAL YEAR TO DATE as % of FORECAST		From Prior Year \$ Change % Change		Budget to Forecast \$ Change % Change	
	THIS YEAR '000	LAST YEAR '000		'000		'000								
Operating revenues														
Water	\$ 28,589	\$ 28,730	\$ 48,083	\$ 48,141	59.46%	59.39%	\$ (141)	(0.49%)	\$ 58	0.12%				
Wastewater	41,682	42,111	70,365	70,401	59.24%	59.21%	(429)	(1.02%)	36	0.05%				
Stormwater site generated service	3,607	3,585	6,047	6,047	59.65%	59.65%	22	0.61%	0	0.00%				
Stormwater right of way service	2,237	2,237	3,835	3,835	58.33%	58.33%	0	0.00%	0	0.00%				
Fire protection (public and private)	4,649	4,641	7,958	8,410	58.42%	55.28%	8	0.17%	452	5.68%				
Other services and fees	811	924	1,416	1,371	57.27%	59.15%	(113)	(12.23%)	(45)	(3.18%)				
Late payment and other connection fees	60	270	520	304	11.54%	19.74%	(210)	(77.78%)	(216)	(41.54%)				
Miscellaneous	242	251	391	391	61.89%	61.89%	(9)	(3.59%)	0	0.00%				
	81,877	82,749	138,615	138,900	59.07%	58.95%	(872)	(1.05%)	285	0.21%				
Operating expenditures														
Water supply and treatment	5,828	5,435	10,590	10,478	55.03%	55.62%	393	7.23%	(112)	(1.06%)				
Water transmission and distribution	6,840	6,349	12,311	11,815	55.56%	57.89%	491	7.73%	(496)	(4.03%)				
Wastewater collection	8,043	7,579	13,499	13,139	59.58%	61.21%	464	6.12%	(360)	(2.67%)				
Stormwater collection	2,843	2,938	5,821	5,534	48.84%	51.37%	(95)	(3.23%)	(287)	(4.93%)				
Wastewater treatment	11,411	11,344	21,413	20,431	53.29%	55.85%	67	0.59%	(982)	(4.59%)				
Engineering and information services	5,377	5,792	9,204	8,953	58.42%	60.06%	(415)	(7.17%)	(251)	(2.73%)				
Regulatory services	2,340	2,165	4,359	4,111	53.68%	56.92%	175	8.08%	(248)	(5.69%)				
Customer services	2,854	3,086	5,414	5,156	52.72%	55.35%	(232)	(7.52%)	(258)	(4.77%)				
Administration services	3,330	3,472	8,071	7,779	41.26%	42.81%	(142)	(4.09%)	(292)	(3.62%)				
Depreciation and amortization	15,342	13,695	27,430	28,742	55.93%	53.38%	1,647	12.03%	1,312	4.78%				
	64,208	61,855	118,112	116,138	54.36%	55.29%	2,353	3.80%	(1,974)	(1.67%)				
Earnings from operations before financial and other revenues and expenditures	17,669	20,894	20,503	22,762	86.18%	77.62%	(3,225)	(15.44%)	2,259	11.02%				
Financial and other revenues														
Interest	149	618	87	226	171.26%	65.93%	(469)	(75.89%)	139	159.77%				
Other	323	367	533	533	60.60%	60.60%	(44)	(11.99%)	0	0.00%				
	472	985	620	759	76.13%	62.19%	(513)	(52.08%)	139	22.42%				
Financial and other expenditures														
Interest on long term debt	4,229	4,158	8,823	7,209	47.93%	58.66%	71	1.71%	(1,614)	(18.29%)				
Repayment on long term debt	11,845	10,666	21,880	20,894	54.14%	56.69%	1,179	11.05%	(986)	(4.51%)				
Amortization of debt discount	122	105	228	228	53.51%	53.51%	17	16.19%	0	0.00%				
Dividend/grant in lieu of taxes	3,282	2,962	6,114	5,953	53.68%	55.13%	320	10.80%	(161)	(2.63%)				
Other	27	32	32	42	84.38%	64.29%	(5)	(15.63%)	10	31.25%				
	19,505	17,923	37,077	34,326	52.61%	56.82%	1,582	8.83%	(2,751)	(7.42%)				
Earnings (loss) for the year	\$ (1,364)	\$ 3,956	\$ (15,954)	\$ (10,805)	8.55%	12.62%	\$ (5,320)	(134.48%)	\$ 5,149	(32.27%)				

HALIFAX WATER
 UNAUDITED STATEMENT OF EARNINGS - WATER - NSUARB
 APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
 ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21	APR 1/20 MAR 31/21	ACTUAL YEAR TO DATE	ACTUAL YEAR TO DATE	From Prior Year		Budget to Forecast	
	THIS YEAR	LAST YEAR	BUDGET	FORECAST	as % of	as % of	\$ Change	% Change	\$ Change	% Change
	'000	'000	'000	'000	BUDGET	FORECAST				
Operating revenues										
Water	\$ 28,589	\$ 28,730	\$ 48,083	\$ 48,141	59.46%	59.39%	\$ (141)	(0.49%)	\$ 58	0.12%
Public fire protection	4,127	4,127	7,074	7,336	58.34%	56.26%	0	0.00%	262	3.70%
Private fire protection	522	514	884	1,074	59.05%	48.60%	8	1.56%	190	21.49%
Bulk water stations	247	229	303	320	81.52%	77.19%	18	7.86%	17	5.61%
Late payment and other connection fees	40	146	238	139	16.81%	28.78%	(106)	(72.60%)	(99)	(41.60%)
Miscellaneous	92	105	163	163	56.44%	56.44%	(13)	(12.38%)	0	0.00%
	33,617	33,851	56,745	57,173	59.24%	58.80%	(234)	(0.69%)	428	0.75%
Operating expenditures										
Water supply and treatment	5,828	5,435	10,590	10,478	55.03%	55.62%	393	7.23%	(112)	(1.06%)
Water transmission and distribution	6,840	6,349	12,311	11,815	55.56%	57.89%	491	7.73%	(496)	(4.03%)
Engineering and information services	2,394	2,493	4,162	4,114	57.52%	58.19%	(99)	(3.97%)	(48)	(1.15%)
Regulatory services	626	482	1,195	1,144	52.38%	54.72%	144	29.88%	(51)	(4.27%)
Customer services	1,454	1,575	2,758	2,627	52.72%	55.35%	(121)	(7.68%)	(131)	(4.75%)
Administration services	1,595	1,788	4,112	3,963	38.79%	40.25%	(193)	(10.79%)	(149)	(3.62%)
Depreciation and amortization	6,084	5,308	10,993	11,219	55.34%	54.23%	776	14.62%	226	2.06%
	24,821	23,430	46,121	45,360	53.82%	54.72%	1,391	5.94%	(761)	(1.65%)
Earnings from operations before financial and other revenues and expenditures	8,796	10,421	10,624	11,813	82.79%	74.46%	(1,625)	(15.59%)	1,189	11.19%
Financial and other revenues										
Interest	88	278	39	134	225.64%	65.67%	(190)	(68.35%)	95	243.59%
Other	241	306	394	394	61.17%	61.17%	(65)	(21.24%)	0	0.00%
	329	584	433	528	75.98%	62.31%	(255)	(43.66%)	95	21.94%
Financial and other expenditures										
Interest on long term debt	1,182	1,031	3,127	2,071	37.80%	57.07%	151	14.65%	(1,056)	(33.77%)
Repayment on long term debt	3,089	2,694	6,465	5,612	47.78%	55.04%	395	14.66%	(853)	(13.19%)
Amortization of debt discount	42	36	84	84	50.00%	50.00%	6	16.67%	0	0.00%
Dividend/grant in lieu of taxes	3,207	2,962	5,654	5,497	56.72%	58.34%	245	8.27%	(157)	(2.78%)
Other	15	16	2	12	750.00%	125.00%	(1)	(6.25%)	10	500.00%
	7,535	6,739	15,332	13,276	49.15%	56.76%	796	11.81%	(2,056)	(13.41%)
Earnings (loss) for the year	\$ 1,590	\$ 4,266	\$ (4,275)	\$ (935)	(37.19%)	(170.05%)	\$ (2,676)	(62.73%)	\$ 3,340	(78.13%)

HALIFAX WATER
 UNAUDITED STATEMENT OF EARNINGS - WASTEWATER - NSUARB
 APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
 ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21 BUDGET	APR 1/20 MAR 31/21 FORECAST	ACTUAL YEAR TO DATE as % of BUDGET	ACTUAL YEAR TO DATE as % of FORECAST	From Prior Year		Budget to Forecast	
	THIS YEAR '000	LAST YEAR '000	'000	'000			\$ Change	% Change	\$ Change	% Change
Operating revenues										
Wastewater	\$ 41,682	\$ 42,111	\$ 70,365	\$ 70,401	59.24%	59.21%	\$ (429)	(1.02%)	\$ 36	0.05%
Leachate and other contract revenue	230	261	473	473	48.63%	48.63%	(31)	(11.88%)	0	0.00%
Septage tipping fees	317	369	505	505	62.77%	62.77%	(52)	(14.09%)	0	0.00%
Overstrength surcharge	0	13	30	20	0.00%	0.00%	(13)	(100.00%)	(10)	(33.33%)
Airplane effluent	17	52	105	53	16.19%	32.08%	(35)	(67.31%)	(52)	(49.52%)
Late payment and other connection fees	20	109	176	103	11.36%	19.42%	(89)	(81.65%)	(73)	(41.48%)
Miscellaneous	90	89	136	136	66.18%	66.18%	1	1.12%	0	0.00%
	42,356	43,004	71,790	71,691	59.00%	59.08%	(648)	(1.51%)	(99)	(0.14%)
Operating expenditures										
Wastewater collection	8,043	7,579	13,499	13,139	59.58%	61.21%	464	6.12%	(360)	(2.67%)
Wastewater treatment	11,411	11,344	21,413	20,431	53.29%	55.85%	67	0.59%	(982)	(4.59%)
Engineering and information services	2,693	2,837	3,769	3,708	71.45%	72.63%	(144)	(5.08%)	(61)	(1.62%)
Regulatory services	819	826	1,537	1,444	53.29%	56.72%	(7)	(0.85%)	(93)	(6.05%)
Customer services	1,245	1,300	2,352	2,234	52.93%	55.73%	(55)	(4.23%)	(118)	(5.02%)
Administration services	1,492	1,452	3,405	3,282	43.82%	45.46%	40	2.75%	(123)	(3.61%)
Depreciation and amortization	8,436	7,785	15,072	15,770	55.97%	53.49%	651	8.36%	698	4.63%
	34,139	33,123	61,047	60,008	55.92%	56.89%	1,016	3.07%	(1,039)	(1.70%)
Earnings from operations before financial and other revenues and expenditures	8,217	9,881	10,743	11,683	76.49%	70.33%	(1,664)	(16.84%)	940	8.75%
Financial and other revenues										
Interest	38	278	39	58	97.44%	65.52%	(240)	(86.33%)	19	48.72%
Other	82	61	139	139	58.99%	58.99%	21	34.43%	0	0.00%
	120	339	178	197	67.42%	60.91%	(219)	(64.60%)	19	10.67%
Financial and other expenditures										
Interest on long term debt	2,647	2,784	4,772	4,436	55.47%	59.67%	(137)	(4.92%)	(336)	(7.04%)
Repayment on long term debt	7,726	7,154	13,442	13,382	57.48%	57.73%	572	8.00%	(60)	(0.45%)
Amortization of debt discount	70	62	124	124	56.45%	56.45%	8	12.90%	0	0.00%
Dividend/grant in lieu of taxes	64	0	398	388	16.08%	16.49%	64	0.00%	(10)	(2.51%)
Other	12	16	30	30	40.00%	40.00%	(4)	(25.00%)	0	0.00%
	10,519	10,016	18,766	18,360	56.05%	57.29%	503	5.02%	(406)	(2.16%)
Earnings (loss) for the year	\$ (2,182)	\$ 204	\$ (7,845)	\$ (6,480)	27.81%	33.67%	\$ (2,386)	(1169.61%)	\$ 1,365	(17.40%)

HALIFAX WATER
 UNAUDITED STATEMENT OF EARNINGS - STORMWATER - NSUARB
 APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
 ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21 BUDGET	APR 1/20 MAR 31/21 FORECAST	ACTUAL YEAR TO DATE as % of BUDGET	ACTUAL YEAR TO DATE as % of FORECAST	From Prior Year		Budget to Forecast	
	THIS YEAR '000	LAST YEAR '000	'000	'000			\$ Change	% Change	\$ Change	% Change
Operating revenues										
Stormwater site generated service	\$ 3,607	\$ 3,585	\$ 6,047	\$ 6,047	59.65%	59.65%	\$ 22	0.61%	\$ 0	0.00%
Stormwater right of way service	2,237	2,237	3,835	3,835	58.33%	58.33%	0	0.00%	0	0.00%
Late payment and other connection fees	0	15	106	62	0.00%	0.00%	(15)	(100.00%)	(44)	(41.51%)
Miscellaneous	60	57	92	92	65.22%	65.22%	3	5.26%	0	0.00%
	5,904	5,894	10,080	10,036	58.57%	58.83%	10	0.17%	(44)	(0.44%)
Operating expenditures										
Stormwater collection	2,843	2,938	5,821	5,534	48.84%	51.37%	(95)	(3.23%)	(287)	(4.93%)
Engineering and information services	290	462	1,273	1,131	22.78%	25.64%	(172)	(37.23%)	(142)	(11.15%)
Regulatory services	895	857	1,627	1,523	55.01%	58.77%	38	4.43%	(104)	(6.39%)
Customer services	155	211	304	295	50.99%	52.54%	(56)	(26.54%)	(9)	(2.96%)
Administration services	243	232	554	534	43.86%	45.51%	11	4.74%	(20)	(3.61%)
Depreciation and amortization	822	602	1,365	1,753	60.22%	46.89%	220	36.54%	388	28.42%
	5,248	5,302	10,944	10,770	47.95%	48.73%	(54)	(1.02%)	(174)	(1.59%)
Earnings from operations before financial and other revenues and expenditures	656	592	(864)	(734)	(75.93%)	(89.37%)	64	10.81%	130	(15.05%)
Financial and other revenues										
Interest	23	62	9	34	255.56%	67.65%	(39)	(62.90%)	25	277.78%
	23	62	9	34	255.56%	67.65%	(39)	(62.90%)	25	277.78%
Financial and other expenditures										
Interest on long term debt	400	343	924	702	43.29%	56.98%	57	16.62%	(222)	(24.03%)
Repayment on long term debt	1,030	818	1,973	1,900	52.20%	54.21%	212	25.92%	(73)	(3.70%)
Amortization of debt discount	10	7	20	20	50.00%	50.00%	3	42.86%	0	0.00%
Dividend/grant in lieu of taxes	11	0	62	68	17.74%	16.18%	11	0.00%	6	9.68%
	1,451	1,168	2,979	2,690	48.71%	53.94%	283	24.23%	(289)	(9.70%)
Loss for the year	\$ (772)	\$ (514)	\$ (3,834)	\$ (3,390)	20.14%	22.77%	\$ (258)	50.19%	\$ 444	(11.58%)

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - REGULATED AND UNREGULATED ACTIVITIES - NSUARB
APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21		APR 1/20 MAR 31/21		ACTUAL YEAR TO DATE		ACTUAL YEAR TO DATE		From Prior Year		Budget to Forecast	
	THIS YEAR	LAST YEAR	BUDGET		FORECAST		as % of		as % of		\$ Change	% Change	\$ Change	% Change
	'000	'000	'000		'000		BUDGET		FORECAST					
REGULATED ACTIVITIES														
Operating revenues														
Water	\$ 28,589	\$ 28,730	\$ 48,083	\$	48,141		59.46%		59.39%	\$	(141)	(0.49%)	\$ 58	0.12%
Wastewater	41,682	42,111	70,365		70,401		59.24%		59.21%		(429)	(1.02%)	36	0.05%
Stormwater	5,844	5,822	9,882		9,882		59.14%		59.14%		22	0.38%	0	0.00%
Public fire protection	4,127	4,127	7,074		7,336		58.34%		56.26%		0	0.00%	262	3.70%
Private fire protection	522	514	884		1,074		59.05%		48.60%		8	1.56%	190	21.49%
Other operating revenue	533	741	1,206		997		44.20%		53.46%		(208)	(28.07%)	(209)	(17.33%)
	81,297	82,045	137,494		137,831		59.13%		58.98%		(748)	(0.91%)	337	0.25%
Operating expenditures														
Water supply and treatment	5,817	5,427	10,562		10,450		55.07%		55.67%		390	7.19%	(112)	(1.06%)
Water transmission and distribution	6,840	6,349	12,311		11,815		55.56%		57.89%		491	7.73%	(496)	(4.03%)
Wastewater collection	8,015	7,563	13,388		13,028		59.87%		61.52%		452	5.98%	(360)	(2.69%)
Stormwater collection	2,843	2,938	5,821		5,534		48.84%		51.37%		(95)	(3.23%)	(287)	(4.93%)
Wastewater treatment	11,138	10,900	20,571		19,764		54.14%		56.35%		238	2.18%	(807)	(3.92%)
Engineering and information services	5,377	5,792	9,204		8,953		58.42%		60.06%		(415)	(7.17%)	(251)	(2.73%)
Regulatory services	2,340	2,165	4,359		4,111		53.68%		56.92%		175	8.08%	(248)	(5.69%)
Customer services	2,818	3,063	5,374		5,116		52.44%		55.08%		(245)	(8.00%)	(258)	(4.80%)
Administration services	3,320	3,449	8,043		7,751		41.28%		42.83%		(129)	(3.74%)	(292)	(3.63%)
Depreciation and amortization	15,332	13,685	27,412		28,724		55.93%		53.38%		1,647	12.04%	1,312	4.79%
	63,840	61,331	117,045		115,246		54.54%		55.39%		2,509	4.09%	(1,799)	(1.54%)
Earnings from operations before financial and other revenues and expenditures	17,457	20,714	20,449		22,585		85.37%		77.29%		(3,257)	(15.72%)	2,136	10.45%
Financial and other revenues														
Interest	149	618	87		226		171.26%		65.93%		(469)	(75.89%)	139	159.77%
Other	7	94	32		32		21.88%		21.88%		(87)	(92.55%)	0	0.00%
	156	712	119		258		131.09%		60.47%		(556)	(78.09%)	139	116.81%
Financial and other expenditures														
Interest on long term debt	4,229	4,158	8,823		7,209		47.93%		58.66%		71	1.71%	(1,614)	(18.29%)
Repayment on long term debt	11,845	10,666	21,880		20,894		54.14%		56.69%		1,179	11.05%	(986)	(4.51%)
Amortization of debt discount	122	105	228		228		53.51%		53.51%		17	16.19%	0	0.00%
Dividend/grant in lieu of taxes	3,282	2,962	6,114		5,953		53.68%		55.13%		320	10.80%	(161)	(2.63%)
	19,478	17,891	37,045		34,284		52.58%		56.81%		1,587	8.87%	(2,761)	(7.45%)
Earnings (loss) for the year - Regulated	\$ (1,865)	\$ 3,535	\$ (16,477)	\$	(11,441)		11.32%		16.30%	\$	(5,400)	(152.76%)	\$ 5,036	(30.56%)

HALIFAX WATER
 UNAUDITED STATEMENT OF EARNINGS - REGULATED AND UNREGULATED ACTIVITIES - NSUARB
 APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
 ACTUAL YEAR TO DATE COMPLETE: 58.33%

	ACTUAL YEAR TO DATE		APR 1/20 MAR 31/21 BUDGET	APR 1/20 MAR 31/21 FORECAST	ACTUAL YEAR TO DATE as % of BUDGET	ACTUAL YEAR TO DATE as % of FORECAST	From Prior Year		Budget to Forecast	
	THIS YEAR '000	LAST YEAR '000	'000	'000			\$ Change	% Change	\$ Change	% Change
UNREGULATED ACTIVITIES										
Operating revenues										
Septage tipping fees	317	369	505	505	62.77%	62.77%	(52)	(14.09%)	0	0.00%
Leachate and other contract revenue	230	261	473	473	48.63%	48.63%	(31)	(11.88%)	0	0.00%
Airplane effluent	17	52	105	53	16.19%	32.08%	(35)	(67.31%)	(52)	(49.52%)
Miscellaneous	16	22	38	38	42.11%	42.11%	(6)	(27.27%)	0	0.00%
	580	704	1,121	1,069	51.74%	54.26%	(124)	(17.61%)	(52)	(4.64%)
Operating expenditures										
Water supply and treatment	11	8	28	28	39.29%	39.29%	3	37.50%	0	0.00%
Wastewater treatment	273	444	842	667	32.42%	40.93%	(171)	(38.51%)	(175)	(20.78%)
Wastewater collection	28	16	111	111	25.23%	25.23%	12	75.00%	0	0.00%
Sponsorships and donations	46	46	68	68	67.65%	67.65%	0	0.00%	0	0.00%
Depreciation and amortization	10	10	18	18	55.56%	55.56%	0	0.00%	0	0.00%
	368	524	1,067	892	34.49%	41.26%	(156)	(29.77%)	(175)	(16.40%)
Earnings from operations before financial and other revenues and expenditures	212	180	54	177	392.59%	119.77%	32	17.78%	123	227.78%
Financial and other revenues										
Other - leases and rentals	188	179	316	316	59.49%	59.49%	9	5.03%	0	0.00%
Other - energy projects	128	94	185	185	69.19%	69.19%	34	36.17%	0	0.00%
	316	273	501	501	63.07%	63.07%	43	15.75%	0	0.00%
Financial and other expenditures										
Other	27	32	32	42	84.38%	64.29%	(5)	(15.63%)	10	31.25%
	27	32	32	42	84.38%	64.29%	(5)	(15.63%)	10	31.25%
Earnings for the year - Unregulated	\$ 501	\$ 421	\$ 523	\$ 636	95.79%	78.77%	\$ 80	19.00%	\$ 113	21.61%
Total earnings (loss) for the year (Regulated and Unregulated)	\$ (1,364)	\$ 3,956	\$ (15,954)	\$ (10,805)	8.55%	12.62%	\$ (5,320)	(134.48%)	\$ 5,149	(32.27%)

Item 4.2 to Follow

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board as Trustees of the
Halifax Regional Water Commission Employees' Pension Plan

SUBMITTED BY: Louis de Montbrun Digitally signed by Louis de Montbrun
Date: 2020.11.20
14:43:46 -04'00'
Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

APPROVED: Cathie O'Toole Digitally signed by Cathie O'Toole
Date: 2020.11.20
14:39:45 -04'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: November 16, 2020

SUBJECT: **Proposed 2021 Halifax Regional Water Commission
Employees' Pension Plan Budget**

ORIGIN

The Halifax Regional Water Commission Board (the "Board"), as Trustees of the Halifax Regional Water Commission Employees' Pension Plan (the "Plan"), approves the annual budget for the Plan.

RECOMMENDATION

It is recommended the Board approve the proposed 2021 budget for the Plan covering the period January 1, 2021 to December 31, 2021.

BACKGROUND

The purpose of the 2021 budget, as reported in the attached statement of changes in net assets available for benefits, outlines the various revenues, contributions and expenses of the defined benefit pension plan established for the employees of the Halifax Regional Water Commission ("Halifax Water"). Supplemental plans, namely the defined contribution plan and notional retirement compensation agreements are not reported, since

budget implications related to these plans are included in the annual operating budget of Halifax Water.

DISCUSSION

The attached statement of changes in net assets available for benefits provides a comparison between the proposed 2021 budget, the approved 2020 budget, and the year-end audited results for 2019.

As reported in the attachment, for 2021 the net assets available for benefits are projected to increase by \$9.8 million compared to \$6.8 million in 2020, and \$15.1 million in 2019. This increase is driven by favourable results anticipated related to revenues and contributions, net of expenses.

Revenue:

Total revenue for 2021 is budgeted at \$8.6 million, representing a \$2.6 million or 42.8% increase compared to 2020, and a decrease of \$5.5 million or 39.1% compared to 2019. Revenue is derived from two (2) primary sources:

- Investment income, and
- Increase in the fair value of investment assets.

The greatest impact in 2021 affecting revenue compared with 2020 relates to the projected increase in the fair value of investment assets of \$5.1 million. In 2020, the increase was budgeted at \$3.0 million, and for 2019 the reported increase in the fair value of investment assets was \$10.6 million. Changes in the fair value of investment assets tend to be more volatile compared to investment income. Increases over the past 5 years have varied significantly, going from a high of \$10.6 million in 2019 to a low \$1.8 million in 2018. Results for 2020 show the fair value of investment assets have increased \$0.6 million for the 9-month period ending September 30, 2020, and were generally lower than anticipated because of the effect COVID-19 had on capital markets during the year. Although First Quarter results showed a decrease in the fair value of investment assets of (\$7.6) million, the Second and Third Quarter results have shown a recovery with increases of \$5.3 million and \$2.9 million respectively.

Investment income has been relatively consistent historically, averaging \$3.1 million during the 3-year period 2017-2019. Results for 2020 show investment income tracking at \$2.6 million for the 9-month period ending September 30, 2020. Investment income budgeted in 2021 of \$3.7 million represents a \$0.2 million increase compared to 2020, and an increase of \$0.1 million compared to 2019. Investment income budgeted for 2021 is based on the continued favourable results of the Halifax Regional Municipality Master Trust (the “Master Trust”). For the 12-month period ending June 30, 2020 the Master Trust earned a return of 4.8%.

Key assumptions:

- Investment Income
 - ❖ Based on annualized results for 2020, plus an estimated 5.1% growth factor
- Increase in the fair market of investment assets
 - ❖ Based on extrapolated results for 2020, plus an estimated 5.8% growth factor

Contributions:

Contributions are budgeted at \$6.7 million in 2021, representing an increase of \$0.4 million or 5.6% compared to 2020, and an increase of \$0.3 million or 4.9% compared to 2019. The increase is attributed to projected new hires during the year, normal salary/wage increases, and movement of personnel within salary bands.

Key assumptions:

- Projected 20 new hires
- Salary/ wage escalations
 - ❖ Non-union – based on projected CPI of 0.5%
 - ❖ Union – based on respective collective agreements
- Pensionable earnings capped at \$140,945 (until 2023)

Expenses:

Expenses of \$5.5 million are budgeted for 2021, a decrease of \$0.1 million or 1.4% compared to 2020, and an increase of \$0.1 million or 2.2% compared to 2019. Benefit payments are the main driver of total expenses, and consist of:

1. Benefits payments to pensioners and survivors,
2. Termination payments, and
3. Death benefit payments.

Benefits paid to pensioners and survivors increase annually as a result of employees retiring from the Commission, and as a result of indexation provided in the Plan. For 2021 budgeted payments to pensioners increase from \$4.6 million in 2020 to \$4.9 million based on projected retirements and indexation.

Termination payments are difficult to predict. In 2019 termination payments were \$1.0 million. Results for the 9-month period ending September 30, 2020 total \$0.4 million compared to an annual budget of \$0.8 million. For 2021 the budget has been decreased by \$0.3 million to a level within the range of the average paid out over the past 4 years.

Administrative expenses account for approximately 2.7% of the overall budgeted expenses. For 2021 total administrative expenses are \$0.1 million, which are comparable to 2020 and

2019. Actuarial and consulting fees represent the largest expense within the administrative grouping.

Key Assumptions:

- Indexing – based on projected CPI of 0.5%
- Projected 14 new retirements
- Termination payments
 - ❖ Based on 3-year historical average, and annualization of 2020 actuals
- Assume no death benefit payments for 2021

ATTACHMENT

Proposed 2021 HRWC Employees' Pension Plan Budget

Report Prepared by:

**Heather
Britten**

Digitally signed by
Heather Britten
Date: 2020.11.20
14:49:36 -04'00'

Heather Britten, B.Comm.
Quality Assurance Officer, (902) 490-1895

Halifax Regional Water Commission Employees' Pension Plan
Statement of changes in net assets available for benefits
January 1, 2021 to December 31, 2021

	Actual (Audited) 2019	Approved Budget 2020	Proposed Budget 2021
Revenue			
Net investment income:			
Total investment income	\$3,644,079	\$3,240,000	\$3,700,000
Investment manager fees	(\$202,574)	(\$230,000)	(\$220,000)
Increase in the fair value of investment assets	\$10,642,209	\$3,000,000	\$5,100,000
	<u>\$14,083,715</u>	<u>\$6,010,000</u>	<u>\$8,580,000</u>
Contributions			
Participants:			
Current service (includes additional voluntary contributions)	\$3,463,328	\$3,236,000	\$3,417,000
Sponsors:			
Current service	\$2,972,138	\$3,155,000	\$3,332,000
	<u>\$6,435,466</u>	<u>\$6,391,000</u>	<u>\$6,749,000</u>
Expenses			
Benefit payments:			
Benefit payments	\$4,226,855	\$4,642,000	\$4,866,000
Termination payments	\$960,187	\$800,000	\$500,000
	<u>\$5,187,041</u>	<u>\$5,442,000</u>	<u>\$5,366,000</u>
Administrative:			
Actuarial and consulting fees	\$118,659	\$75,000	\$55,000
Audit and accounting fees	\$8,530	\$9,000	\$9,000
Bank custodian fees	\$28,636	\$25,000	\$30,000
Insurance	\$8,760	\$9,000	\$9,000
Miscellaneous	\$20,610	\$15,000	\$20,000
Professional fees	\$23,261	\$15,000	\$20,000
Registration fees	\$2,500	\$3,000	\$3,000
Training (Trustees/ Administration/ Pension Committee)	\$0	\$2,000	\$2,000
	<u>\$5,397,997</u>	<u>\$5,595,000</u>	<u>\$5,514,000</u>
Increase in net assets available for benefits	<u><u>\$15,121,184</u></u>	<u><u>\$6,806,000</u></u>	<u><u>\$9,815,000</u></u>

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: **Jamie Hannam** Digitally signed by Jamie Hannam
Date: 2020.11.19 12:26:47 -04'00'

Jamie Hannam, P.Eng.
Director, Engineering & Information Services

APPROVED: **Cathie O'Toole** Digitally signed by Cathie O'Toole
Date: 2020.11.20 13:47:27 -04'00'

Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 18, 2020

SUBJECT: **Capital Project Funding Approval Policy - Revision**

ORIGIN

2020 Capital Project Funding Business Process Review

RECOMMENDATION

It is recommended that the Halifax Water Board approve the revised **Capital Project Funding Approval Policy** (dated November 18, 2020) as attached.

BACKGROUND

Halifax Water expenditures are capitalized when a newly acquired or constructed item (or pooled group of homogeneous assets) has a value greater than \$5,000 and has a life expectancy beyond one year.

Halifax Water develops an annual capital budget document that identifies the proposed capital projects to be funded within the given fiscal year. For each individual item, the capital budget defines the project description, required funding and funding source.

The annual capital budget consists of separate categories for water, wastewater, and stormwater assets as well as corporate projects (benefitting multiple asset categories).

In advance of each fiscal year, the Halifax Water Capital Budget is approved in principle by the Halifax Water Board and the Nova Scotia Utility and Review Board (NSUARB). The subsequent approval process for individual projects is detailed within the **Capital Project Funding Approval Policy**.

DISCUSSION

Consistent with the Public Utilities Act, the Halifax Water **Capital Project Funding Approval Policy** (the policy) requires Halifax Water to obtain approval from the NSUARB for individual capital projects over \$1 million in total project cost and approval from the Halifax Water Board for projects over \$5 million.

In addition, the current policy requires the General Manager to approve all individual projects up to \$1 million in value.

Halifax Water staff have reviewed the business processes centered around the approval and management of capital funds. Based on a review of best practices from other public sector entities, one of the areas identified for process improvement is the approval process for capital projects under \$1 million. It is recommended that individual capital projects of under \$1 million are approved with the Approval in Principle of the annual Capital Budget by the Halifax Water Board and the NSUARB. This process would streamline the approval of the large volume of smaller capital projects, reducing redundant administrative work that is currently adding limited value and shorten the delivery schedule for these projects.

The General Manager has the opportunity to review the capital projects under \$1 million in conjunction with preparation of the annual Capital Budget, as there are supporting documents for each project which describe the scope.

Any projects less than \$1million that are not identified in the annual Capital Budget, or where there is a scope change, would continue to require General Manager approval.

Halifax Water's capital budget has been steadily increasing and will continue to increase to meet the Integrated Resource Plan's recommended level of spend. Halifax Water has roughly doubled in size, in terms of assets and capital budget value, following the 2007 transfer of wastewater and stormwater services from the municipality.

BUDGET IMPLICATIONS

The approval of the policy revision has no impact on the capital or operating budget.

ALTERNATIVES

The Board could approve the NSUARB mandated change to the funding policy and maintain the current Halifax Water Board approval limit.

ATTACHMENT

1. Administrative Policy – Capital Project Funding Approval Policy – November 18, 2020

Report Prepared by:	<div style="display: flex; justify-content: space-between; align-items: flex-start;"><div style="margin-bottom: 5px;">Jamie Hannam</div><div style="font-size: 0.8em; text-align: right; color: #ccc;"><small>Digitally signed by Jamie Hannam Date: 2020.11.19 12:26:31 -04'00'</small></div></div> <div style="border-top: 1px solid black; margin-top: 5px; padding-top: 5px;">Jamie Hannam, P.Eng. Director, Engineering & Information Services, 902-490-4804</div>
Financial Reviewed by:	<div style="display: flex; justify-content: space-between; align-items: flex-start;"><div style="margin-bottom: 5px;">Louis de Montbrun</div><div style="font-size: 0.8em; text-align: right; color: #ccc;"><small>Digitally signed by Louis de Montbrun Date: 2020.11.20 13:11:37 -04'00'</small></div></div> <div style="border-top: 1px solid black; margin-top: 5px; padding-top: 5px;">Louis de Montbrun, CPA, CA Director, Corporate Services/CFO, 902-490-3685</div>

ADMINISTRATIVE POLICY
CAPITAL PROJECT FUNDING APPROVAL POLICY
Updated November 18, 2020

1. PREAMBLE

Funding approval for Halifax Water capital projects require the approval of both the Halifax Water Board and the Nova Scotia Utility and Review Board (NSUARB). This policy defines the specific requirements and approval protocols for capital funding approval to ensure accountability, accuracy, and compliance with Halifax Water's accounting standards and NSUARB requirements.

2. ANNUAL CAPITAL BUDGET

In accordance with Halifax Water's policy, expenditures are capitalized when a newly acquired or constructed item has a value greater than \$5,000 and has a life expectancy beyond one year.

Halifax Water develops an annual capital budget document that identifies the proposed capital projects to be funded within the given fiscal year. For each individual item, the capital budget defines the project description, required funding and funding source. Each line item shall also have a detailed supplemental budget sheet that provides a detailed description, project justification and detailed cost estimate. If the project is funded from a restrictive reserve, a brief narrative is provided detailing how the project meets the criteria to qualify for the reserve funding.

The annual capital budget consists of separate categories for water, wastewater, and stormwater assets as well as corporate projects (benefitting multiple asset categories). The budget also includes a summary table of Routine Capital Expenditures.

3. CAPITAL BUDGET APPROVAL

In advance of each fiscal year, the Halifax Water Capital Budget shall be approved by the Halifax Water Board and the NSUARB.

4. INDIVIDUAL PROJECT APPROVAL

No contracts shall be signed until all approvals have been received.

4.1 Projects Identified in the Approved Capital Budget

Subsequent to the Halifax Water Board and the NSUARB approving the Halifax Water Annual Capital Budget, each individual capital project must be formally approved as follows.

4.1.1 Projects of under \$1 million

Individual capital projects of under \$1 million are approved with the approval of the Annual Capital Budget by the Halifax Water Board and the NSUARB.

4.1.2 Projects of over \$1 million and under \$5 million

Individual capital projects of over \$1 million, and under \$5 million, in value shall be approved by the General Manager and subsequently the NSUARB.

4.1.3 Projects of over \$5 million

Individual capital projects of over \$5 million in value shall be approved by the Halifax Water Board and subsequently the NSUARB.

4.2 Projects NOT Identified in the Approved Capital Budget

For clarity, projects with a significant change in scope will be considered as new projects.

For capital projects that were not identified within the annual capital budget, (i.e. projects identified after the annual budget approval) the individual project approval requirements are as follows:

4.2.1 All Projects

All new capital funding approval reports shall be reviewed and approved by the Director, Engineering & IS and the Director of Corporate Services/CFO, or their designates, and the General Manager.

4.2.2 Projects of over \$1 million

Individual capital projects of over \$1 million in value shall be approved by the Halifax Water Board and subsequently the NSUARB.

4.3 Projects with a revised cost

In situations where the revised total project cost moves from below to above \$1 million in value, the project shall be considered a new project not identified in the approved capital budget and the individual project approvals as defined in section 4.2 above should be followed.

4.3.1 All Projects

All projects with a revised cost of 5% or more and greater than \$50 thousand shall be reviewed and approved by the Director, Engineering & IS and the Director of Corporate Services/CFO, or their designates, and the General Manager.

4.3.2 Projects with increases over the greater of 5% or \$250 thousand in value

Individual capital projects with increases that exceed the greater of \$250 thousand or 5% shall be approved by the Halifax Water Board and subsequently the NSUARB.

5. PROJECT SUBSTITUTIONS

As per Section 4251 of the NSUARB Water Utility Accounting & Reporting Handbook, no project may be substituted for another project, nor can the approved funding shift to a different project without prior approval in accordance with the above requirements.

However, any projects that were approved as part of a single capital request (i.e. multiple projects within the watermain renewal program funding); can utilize underspending on one project to cover additional funding required on another project with no application for NSUARB approval.

6. PROJECT ABANDONMENT

Subsequent to the approval in principle of the annual capital budget, any individual project that does not proceed to funding approval, and implementation, shall be formally abandoned from the budget (as per Section 4251 – NSUARB Water Utility Accounting & Reporting Handbook).

The application for the abandonment of a capital project shall be submitted to the NSUARB and must have at a minimum:

- a brief narrative describing the reason for the abandonment;
- how Halifax Water plans to address the issue that the project was intending to solve; and
- the date in which Halifax Water expects to undertake the abandonment project in the future, if applicable.

7. CAPITAL FUNDING AND EXPENDITURE TRACKING/REPORTING

All capital funding approval reports (including funding increases) shall be reviewed and approved as per section 4.

Subsequent to the formal approval of funding for a capital project, a Capital Work Order (CWO) will be opened to capture all costs related to the project. An initial CWO with a spending limit of \$25 thousand and with the approval of the Director may be opened for a given project prior to final funding approval to capture initial costs such as surveys and preliminary studies.

Individual capital projects with approved funding are implemented by the assigned project manager with payments tracked and approved by the project manager with additional approvals as required by Financial Approval Policy and the Signing Authority Policy. The formal approval for capital project invoices and project change orders shall be consistent with authorized approval levels for various staff.

No payments are to be approved if project totals materially exceed the approved funding. The total approved funding including any additional funding increases, as per this policy, shall be identified with the Capital Work order.

All Capital Work Orders, where substantial completion of the work has been achieved as of March 31 of the current year, shall be closed out and capitalized. If there are costs relating to the project that have been incurred but not invoiced, these costs shall be accrued and capitalized. If there are costs that are anticipated but not yet incurred, sufficient funding should remain in a Capital Work Order and the costs capitalized in a future fiscal year once they have incurred.

All costs of studies not leading to a capital project within a reasonable period should be recorded as an expense rather than a capital asset.

For all closed capital work orders, two annual capital project spending summary reports are prepared and submitted to the Halifax Water Board and NSUARB. The first report details all closed capital work orders and their aggregate surplus or deficit. The second report is a subset of the first and only contains projects that required NSUARB approval.

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: **Jamie Hannam** Digitally signed by Jamie Hannam
Date: 2020.11.19 15:46:36 -04'00'

Jamie Hannam, Director, Engineering & Information Services

APPROVED: **Cathie O'Toole** Digitally signed by Cathie O'Toole
Date: 2020.11.20 11:04:00 -04'00'

Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 24, 2020

SUBJECT: **Professional Services for Detailed Design and Tender Phase
Services (Phase 2) – Burnside Operations Centre**

ORIGIN

2009 Halifax Water Facilities Requirements Plan and the 2020/2021 Capital Budget.

RECOMMENDATION

It is recommended that the Halifax Water Board approve funding in the amount of \$810,000 for professional services for the detailed design and tender phase services (Phase 2) of the proposed Burnside Operations Centre for a revised total approved cost to date of \$5,402,000, and an estimated total project cost of \$31,900,000.

BACKGROUND

In 2009, the *Halifax Water Facilities Requirements Plan* reviewed the existing facilities inventory and the 20-year growth projections for the utility, assessed the limitations of the current facilities and provided recommendations to add additional space to meet anticipated operational needs.

In response to the recommendations from the above plan with respect to the East and Central Regions, an *Assessment of the Potential to Combine Central and Eastern Regions Water, Wastewater and Stormwater Operations Centers* report was prepared. . The report highlighted the reality that three of the four existing operational facilities within the east

and central regions were either at the end of their useful life, significantly undersized for current needs or being acquired by the province for highway right-of-way. This Assessment recommended a single combined operations facility to replace the existing four facilities.

A review of this recommendation and its impact on the utility in relation to its facility inventory and service areas was conducted through a *Facilities Consolidation Study* in 2014. The Study supported the assessment which concluded that a single combined East/Central Region, Water, Wastewater, and Stormwater operations facility optimally located within the Burnside Business Park area would offer numerous benefits, including:

- Provides a similar level of service for our customers within the two regions;
- Reduces life cycle costs compared to owning and operating the four (4) existing facilities or two new regional facilities;
- Provides building operational cost-savings;
- Offers economies of shared storage spaces, equipment and materials;
- Improves communication and knowledge sharing by physically sharing space;
- Yields minimal impact on travel/response time to the two service regions;
- Contributes to creating a cohesive culture by bringing employees from different departments and depots together
- Provides for the ease of managing fewer facilities;
- Promotes increased employee morale in a work environment that is sized appropriately and outfitted to modern standards
- New facility may promote additional diversity as it would be designed for a diverse workforce that includes washroom, storage and shower facilities appropriate for women, men and transgendered employees.
- Creates enhanced opportunities for Interdepartmental and integrated collaboration.

Additionally, a location within Burnside Business Park area would position the utility well for future areas of growth – the Dartmouth to Bedford corridor along the Magazine Hill, and the Dartmouth to Fall River corridor.

Based on the recommendation of the facility report, Halifax Water investigated available lots within the Burnside Business Park. The investigation identified a 14-acre site on Jennett Avenue that meet the project requirements and Halifax Water entered into a Purchase and Sale Agreement with the Halifax Regional Municipality.

In January 2020 the Halifax Water Board approved a recommendation to proceed with a land purchase and a single combined operations facility to replace four existing facilities.

Subsequent to the approval from the NSUARB (February 26, 2020), Halifax Water completed the land purchase from the Municipality for the new East/Central Regional Operations Facility. To date the facility study, lot investigation, purchase due diligence and the property acquisition have been completed within an approved budget of \$4,402,000.

The new Regional Operations Facility will become the amalgamated depot for the East and Central Water, and Wastewater & Stormwater depots. The new facility is now being referred to as the ***Burnside Operations Centre*** and is forecasted for occupancy the first quarter of 2024.

DISCUSSION

Since April, Halifax Water has prepared and issued a public Request for Qualifications for the Consulting Services associated with the new facility. Thirteen (13) submissions were received, and the review team selected four (4) proponents. The four (4) proponents were invited to submit on a Request for Proposals (RFP) for Consulting Services for the new facility that would be conducted via a Design-Bid-Build methodology. The RFP requested a full suite of professional services, including technical, architectural, engineering, asset management, building commissioning and life cycle analysis services. Two (2) qualified RFP submissions were received. Each submission was reviewed on their technical and financial merit. ***EastPoint Engineering*** was selected as the preferred proponent. EastPoint's proposal was within the expected cost range for a project of this magnitude.

Halifax Water plans to implement the Professional Services for the design, and construction portions of the project in three phases. Phase 1 includes the preliminary design, phase 2 includes the detailed design and tender phase services, and phase 3 includes construction and commissioning phase services.

Funding in the amount of \$190,000 was recently approved by Halifax Water for the preliminary design and an Agreement has been entered into with EastPoint for the phase 1 work.

The phase 2 detailed design and tender phase services includes the following summarized scope of work:

- Pre-defined Design Review Submissions including civil, structural, architectural, mechanical, electrical, landscape, fire protection, information technology, security and interior design plans;
- Building Information 3-D Modeling (BIM);
- Capital and Operating Life Cycle Modeling;
- Constructability Reviews;
- Asset Management Registry and Inventory Templates;

- Building & Equipment Commissioning Plans;
- Construction Tender Package including Specifications and Drawings;
- Construction Cost Estimates;
- Construction Tender Support, Evaluation and Recommendations; and
- Value Engineering (if required)

The estimated cost for the detailed design and tender phase services, based on the EastPoint proposal, is \$810,000.

Based on a proposed building size of 6,400 m² (69,000 ft²) the estimated cost of the building construction is \$26,500,000. Thus, inclusive of the land purchase, the current Professional Services work and the building construction the total estimated project cost is as follows:

Item	Estimated Cost	Total Estimated Cost
East/Central Regional Facility Study	\$60,000	60,000
Lot Investigation & Purchase Due Diligence	\$100,000	160,000
Land Purchase Approval	\$4,242,000	4,402,000
Phase 1 – Preliminary Design Services	\$190,000	4,592,000
Phase 2 – Detailed Design and Tendering Services	\$810,000	5,402,000
Phase 3 – Construction Management Services	\$26,500,000	31,902,000
Total Estimated Project Cost		31,902,000

For context, the West Operations Depot at 455 Cowie Hill, designed and constructed in 2013, cost \$12.7 million and is 3,143 m² (33,830 ft²).

The design and tender process is proposed to be completed by February 2022 with the final facility completion projected for January 2024.

BUDGET IMPLICATIONS

Funding in the amount of \$810,000, for this phase of the project, is included within the 2020/21 Capital Budget under *Corporate – Facility – East/Central Regional Operational Facility*.

The proposed expenditures all meet the “No Regrets – Unavoidable Needs” approach of the 2012 Integrated Resource Plan. The proposed work meets the NR-UN criteria of “Required to ensure infrastructure system safety and integrity”

Funding for the East-Central Regional Operations Facility is reflected within the Five-Year Business Plan. The Five-Year Operating Budgets reflect continued operation of the four depots. Operational cost savings will be updated once final project cost and timelines are known. Cost savings will be reported through Halifax Water's cost containment process.

ALTERNATIVES

The Halifax Water Board can provide alternate direction. This is not recommended however as that would increase costs and delay the facility completion date.

ATTACHMENT

None

Report Prepared by:

Original signed by:

Rob Gillis, Wastewater Treatment Facility Project Engineer

Financial Reviewed by:

**Louis de
Montbrun**

Digitally signed by Louis
de Montbrun
Date: 2020.11.19
15:48:07 -04'00'

Louis de Montbrun, CPA, CA

Director, Corporate Services/CFO, 902-490-3685

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: **Jamie Hannam** Digitally signed by Jamie Hannam
Date: 2020.11.20
15:31:30 -04'00'

Jamie Hannam, P.Eng., Director, Engineering & Information Services

APPROVED: **Cathie O'Toole** Digitally signed by Cathie O'Toole
Date: 2020.11.20
15:28:28 -04'00'

Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 18, 2020

SUBJECT: **Morris Lake/Russell Lake Forcemain Rehabilitation**

ORIGIN

2020/21 Capital Budget.

RECOMMENDATION

It is recommended that the Halifax Water Board approve the Construction phase of the Morris Lake/Russell Lake Forcemain Rehabilitation project, at an estimated cost of \$2,000,000.

BACKGROUND

The Morris Lake Pumping Station (PS) forcemain was installed in approximately 1986-87. The pipe is 600 mm in diameter, the material used was high density polyethylene (HDPE) and it is approximately 2.5 km long.

There have been several breaks on this HDPE forcemain over the past years. Operations staff have conducted repairs on the failed joints and bends. The impact of the failure events is significant related to the time and logistics of the repair. The typical emergency repair takes over 12 hours with a large crew and involves multiple wastewater pump trucks to keep the system flows managed for the duration. With each event there is also a significant environmental potential impact to the surrounding lands and watercourses from a wastewater discharge.

On November 19, 2019, the General Manager approved \$50,000 to investigate and determine rehabilitation options and CBCL Ltd was retained to develop the project design.

DISCUSSION

CBCL completed a hydraulic transient analysis in January 2020 and the transient pressures predicted for this forcemain appear to be well within the standard allowable surge pressure ratings for the pipeline material.

Staff explored possible causes of breaks with the Engineered Pipe Group (EPG), the local distributor of HDPE piping systems. Based on the findings of the analysis, it appears that the failures being experienced on this forcemain are primarily a result of deficiencies in the material thickness of the elbows, poor pipeline fusing practices and the corrosion and metal loss at the flange locations.

EPG recommended using Multi/Joints as a repair solution. This restrained coupling can connect various pipe materials with different outside diameters and is corrosion resistant.

EPG further advised that the pipe and fittings were all produced by the same manufacturer in the mid 1980's when they were installed. Since the Russell Lake forcemain is the same "vintage", the scope of work has been revised to replace the joints and bends on this forcemain as well. The Russell Lake forcemain is 350 mm in diameter, approximately 1.2 km long. The Russell Lake forcemain travels in parallel and close by to the Morris Lake forcemain.

Thus, the rehabilitation design was finalized to include the replacement of pipe components at a total of 20 locations, 12 bends and 8 joints. Attachment 1 shows the location of bends and joints on the Morris Lake forcemain (Locations 1 to 14) and the Russell Lake forcemain (Locations 15 to 20).

A Request for Qualifications was issued in June 2020, and Halifax Water identified two interested and qualified contractors to submit detailed proposals for the rehabilitation work on the HDPE pipe. A formal Request for Proposals was prepared providing technical details, tender form and specifications. This document was sent to the two pre-qualified contractors on October 30, 2020 with a tender closing date of November 20, 2020.

Halifax Water is also undertaking an upgrade of the Russell Lake PS in 2021. These two projects are being coordinated to minimize impacts within HRM's park (Portland Lakes Greenway Trail) and to reduce risks related to wastewater bypass. As the wastewater system has to remain in operation at all times to avoid system backups and/or overflows and each station is serviced by a single forcemain, this project includes temporary wastewater bypass pumping.

The Morris Lake forcemain leaked again in early November and staff had to conduct a temporary repair. It is important that this project be awarded as soon as possible to allow the Contractor to order and receive the necessary materials. Due to Covid, lead time is currently 8 to 9 weeks for the Multi/Joints. Furthermore, in order to coordinate this project with the Russell Lake PS upgrade, CBCL developed a sequencing plan and the Contractor must conduct some work before the end of April 2021.

The funding request is based on the estimated cost prepared by CBCL. This estimate includes the core rehabilitation work, CBCL's Construction Phase Engineering Services, construction contingency and associated staff costs and expenses as detailed in Attachment 2.

As discussed above, the tender for this project closes on November 20, 2020. Pending the tender opening and technical evaluation, staff will provide an update on the project status and an enhanced financial summary in advance of the Board meeting on Thursday November 26, 2020.

BUDGET IMPLICATIONS

Funding in the amount of \$500,000 is available within the 2020/21 Capital Budget. The additional \$1,500, 000 is requested as an advanced approval from the proposed 2021/22 Capital Budget under "Wastewater Forcemains – Morris Lake Forcemain Investigation and Rehabilitation".

The proposed expenditure meets the "NO REGRETS – UNAVOIDABLE NEEDS" approach of the 2012 Integrated Resource Plan. The proposed work meets the NR-UN criteria of "required to ensure infrastructure system integrity and safety". The project meets the criteria as the work is required in order to maintain an acceptable level of service.

ALTERNATIVES

None

ATTACHMENT

Attachment 1: Forcemain Repair Locations
Attachment 2: Construction Costs

Report Prepared by:

Original signed by:

Renée Roberge, P.Eng., Project Engineer

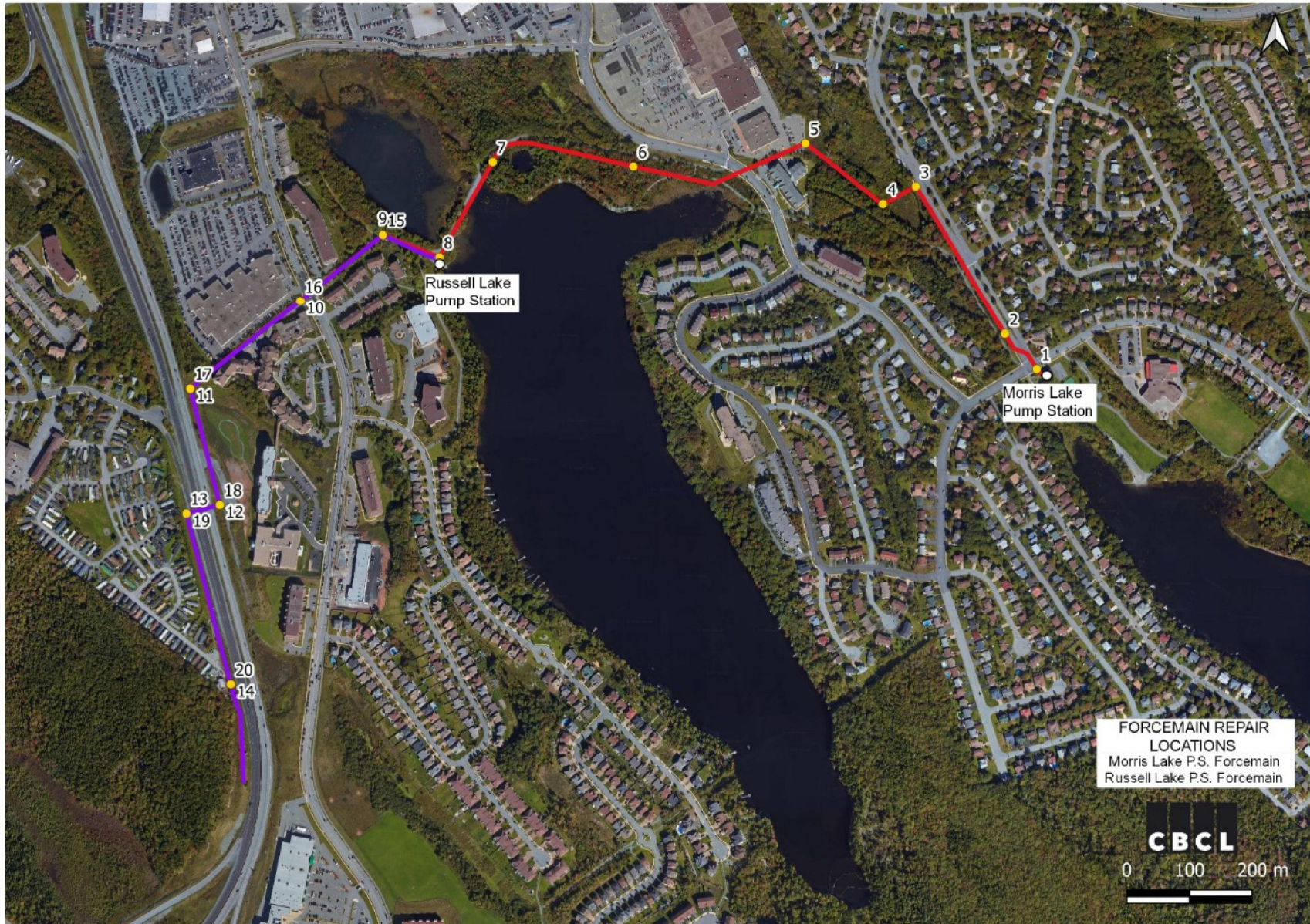
Financial Reviewed by:

Louis de
Montbrun

Digitally signed by Louis de
Montbrun
Date: 2020.11.20 15:30:19
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Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO, 902-490-3685

Page 3 of 3



Attachment 2
Morris Lake/Russell Lake Forcemain Repairs
Construction Phase Cost Estimate

	Cost
Consultant	\$25,000
Contractor	\$1,531,000
Sub-total	\$1,556,000
Contingency (20%)	\$311,200
Sub-total	\$1,867,200
Net HST (4.286%)	\$80,028
Sub-total	\$1,947,228
Halifax Water Staff and Related Expenses	\$25,000
Sub-total	\$1,972,228
Overhead (1%)	\$19,722
Total Construction Phase Cost Estimate	\$1,991,950
Rounded Total	\$2,000,000
Already approved in 2020/21 Budget	\$500,000
Additional funding required	\$1,500,000

Engineer's current estimate

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: **Jamie Hannam**
Digitally signed by Jamie Hannam
Date: 2020.11.20 15:32:54 -04'00'

Jamie Hannam, P.Eng.,
Director, Engineering & Information Services

APPROVED: **Cathie O'Toole**
Digitally signed by Cathie O'Toole
Date: 2020.11.20 15:35:09 -04'00'

Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 16, 2020

SUBJECT: **Fairview Cove Trunk Sewer – Construction Phase**

ORIGIN

The 2017 Halifax Water West Region Wastewater Infrastructure Plan and the 2020/21 to 2024/25 Five Year Capital Budget

RECOMMENDATION

It is recommended that the Halifax Regional Water Commission Board approve funding in the amount of \$16,660,000 for the construction phase of the Fairview Cove Trunk Sewer Project for a revised estimated total project cost of \$17,760,000.

BACKGROUND

In the 1970's, a 6.3 km regional trunk sewer was constructed from Duffus Street to Kearney Lake Road. The intent of the sewer was to intercept sanitary and combined sewer discharges to Bedford Basin/Halifax Harbour and convey them to the Duffus Street Wastewater Pumping Station. The interceptor was generally designed to convey four times dry weather flows based on estimated flow generation rates for the year 2000. The system also included several combined sewer overflows (CSOs) designed to discharge wet weather flows. The alignment generally parallels the shore of the Bedford Basin to Fairview Cove and then to the intersection of Barrington Street and Duffus Street. The Duffus Street Pump Station (PS) now conveys flow from this trunk sewer to the Halifax Wastewater Treatment Facility (WWTF).

The original trunk sewer was built in two phases: the first phase was the "Harbour Storm and Sanitary Interceptor Sewer" and the second phase was the "Bedford Highway Interceptor Sewer". In general, these sewers are 1,800mm diameter (Harbour Storm and Sanitary Interceptor Sewer) and 2,100mm x 1,600mm (Bedford Highway Interceptor Sewer) in size. As indicated on the

attached plan (Attachment 1), there is a 620m section of 1,050mm diameter sewer between the apex of Fairview Cove and MacKintosh Street. This smaller diameter sewer was adequately sized at 1050mm diameter at the time of design to meet the anticipated flows.

In 2017, Halifax Water (working with GM BluePlan Consultants) developed the West Region Wastewater Infrastructure Plan (WRWIP). The WRWIP identified the 1,050mm diameter section of the trunk sewer as a hydraulic constraint. This constraint acts as a bottleneck causing significant surcharging leading to combined sewer overflows. Flows from future growth will increase the frequency and volume of discharge at the CSOs. The WRWIP recommended the elimination of this constraint should be a priority for Halifax Water to mitigate CSO discharges to Bedford Basin, reduce potential local area flooding and improve capacity in the regional trunk system.

GM BluePlan provided a conceptual design that proposed that the 1,050mm diameter sewer be twinned with a new 1,200mm diameter sewer to provide equivalent capacity as the upstream and downstream section of the existing tunnel. The concept scope of work included a new tunnel with an approximate length of 900m installed at depths up to 22m. Micro tunneling was identified as the potential method of construction.

In August 2018, Halifax Water issued a Request for Qualifications (RFQ) for the related engineering services for the Fairview Cove tunnel design. The top three ranked respondents were invited to respond to a Request for Proposals (RFP). In April 2020 Robinson Consultants Inc. (RCI) were awarded the contract for engineering services for the design and construction phase services of the Fairview Cove Trunk Sewer project.

DISCUSSION

RCI undertook the preliminary and detailed design process to identify and select the preferred design approach to best achieve the project goals. The attached Concept Design Report (Attachment 2) provides a full summary of the process and outcomes. RCI's design specifies the installation of a new adjacent tunnel section at the approximate length of 850m and sized at 1,500mm in diameter. The proposed construction methodology has been determined to be micro tunneling. RCI is currently on schedule to complete and submit the final detailed design report and the final design drawings and tender documents are due to be completed and delivered prior to the end of the calendar year.

A formal Request for Qualifications (RFQ) procurement process was undertaken to identify interested and qualified tunnel contractors. This contractor pre-qualification process will be complete by the end of November 2020.

The pre-qualified contractors will be invited to participate in the construction tender process. The current schedule proposes the construction tender to be issued in January 2021 and the award of the work to the successful contractor at the beginning of March 2021. The project is planned to be completed by March of 2022.

Although the final delivery of the detailed design is pending, the estimated cost of the Construction Phase of this project, based on the final detailed design, is \$16,660,000 (Attachment 3). The construction phase cost includes the core tunnel construction, a 10% construction contingency, construction phase engineering services, Halifax Water staff costs, net HST, and overhead as

detailed in the attached cost estimate. The construction phase of the project brings the estimated total project cost to a value of \$17,760,000.

The project is being brought forward for funding approval at this time, in advance of the 21/22 capital budget approval, to help ensure the tender award can proceed as early as practical in 2021 to allow access to a full construction season for the tunnel construction.

BUDGET IMPLICATIONS

Funding in the amount of \$16,660,000 is requested as an advanced approval from the proposed 2021/22 Halifax Water Capital Budget under the Wastewater – Trunk Sewers - Fairview Cove Trunk Sewer – Tunnel Construction. This budget will be brought forward for formal Board approval in January 2021.

This project is identified within the current Integrated Resource Plan as a growth-related project with 75% funding allocated from the Regional Development Charge reserve account based on the increased capacity for the regional wastewater trunk sewer system. The remaining 25% funding is allocated to normal utility funds based on the Benefit to the Existing customers.

The proposed expenditure meets the “NO REGRETS – UNAVOIDABLE NEEDS” approach of the 2012 Integrated Resource Plan. The proposed work meets the NR-UN criteria of “Required to ensure infrastructure system integrity and safety”. The project meets the criteria as the work is required in order to maintain an acceptable level of service.

ALTERNATIVES

None

ATTACHMENTS

Attachment 1 - Site Plan

Attachment 2 – RCI Concept Design Report

Attachment 3 - Cost Estimate

Report Prepared by:

Original signed by:

Roger Levesque

Wastewater Stormwater Infrastructure Project Engineer 902-490-6941

Financial Reviewed by:

**Louis de
Montbrun**

Digitally signed by Louis

de Montbrun

Date: 2020.11.20

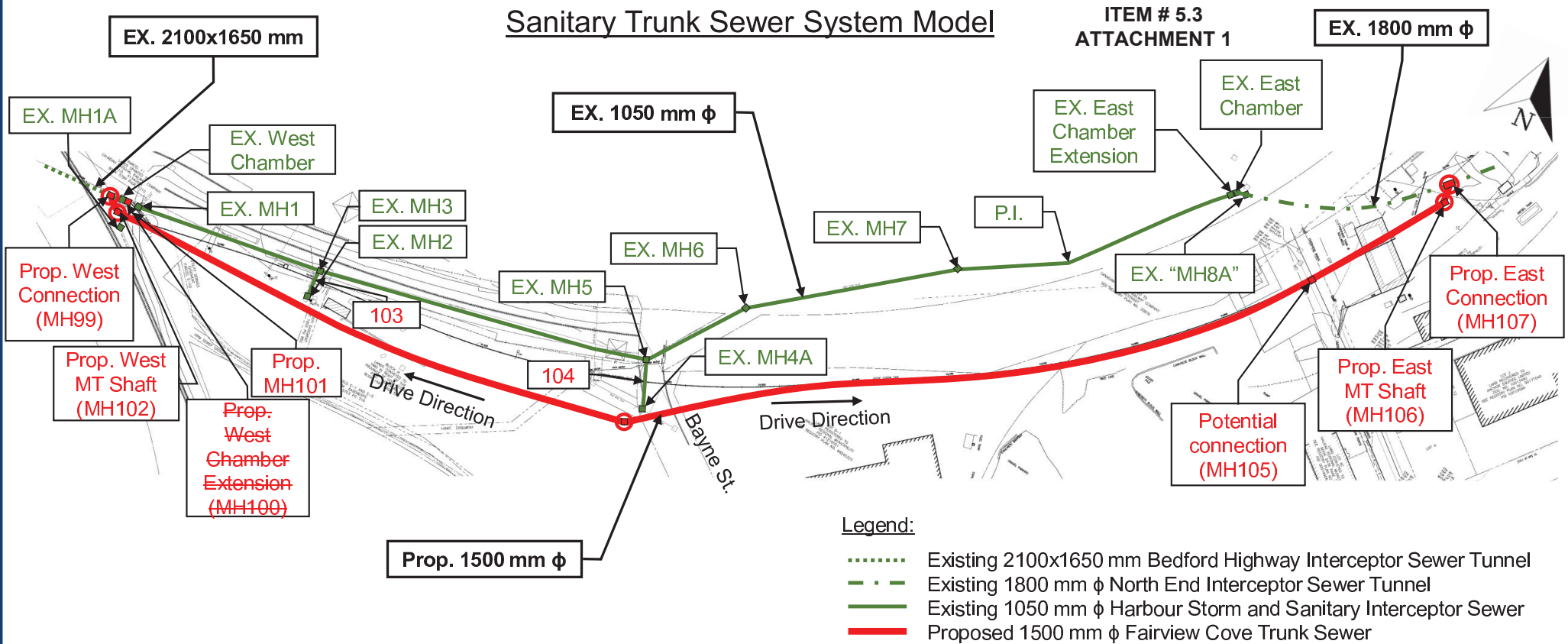
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Louis de Montbrun, CPA, CA

Director, Corporate Services/CFO, 902-490-3685

Sanitary Trunk Sewer System Model

ITEM # 5.3
ATTACHMENT 1



Legend:

- Existing 2100x1650 mm Bedford Highway Interceptor Sewer Tunnel
- - - Existing 1800 mm φ North End Interceptor Sewer Tunnel
- Existing 1050 mm φ Harbour Storm and Sanitary Interceptor Sewer
- Proposed 1500 mm φ Fairview Cove Trunk Sewer

Description:

Dual 1500 mm φ microtunnel drive from Bayne Street proceeding east and west, approximately 750 m total length, with no interconnection points.



Robinson
Consultants

ALDEA
ENGINEERING SERVICES LTD



Fairview Cove Trunk Sewer
-Construction Phase
GM Board Report - Nov 2020
Attachment 1 - Site Plan



Halifax Water
6-1646 Fairview Cove Trunk Sewer

Conceptual Design Report

September 2019
RCI File: 19002



Robinson
Consultants

Robinson Consultants Inc.
911 Golf Links Road, Suite 111
Ancaster, Ontario L9K 1H9
Contact Person: Troy Bauman, P.Eng., MBA
Email: tbauman@rcii.com

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1 INTRODUCTION

1.1 Background Information

Halifax Regional Water Commission (Halifax Water) plans to increase the capacity of the existing trunk sewer along Fairview Cove due to a hydraulic constraint in the system, comprising an existing 620 m long, 1050 mm combined sewer line. A preliminary conceptual assessment performed in 2017 by GM Blueplan presented a design concept to twin the existing 1050 mm section with a new 1200 mm ID sewer using microtunnel construction with a pressurized face Slurry Microtunnel Boring Machine (MTBM). The preliminary concept for the sewer is approximately 900 m long constructed at depths ranging from 5 m to 23 m below the existing ground surface.

Halifax Water retained Robinson Consultants Inc. in partnership with Aldea Engineering Services Ltd. and CBCL Limited to advance the design concept and ultimately prepare the detailed design to increase the capacity of the 1050 mm trunk sewer along Fairview Cove to eliminate the hydraulic constraint in the system.

This Conceptual Design Report has been prepared for Halifax Water to review the preliminary design concept, develop and evaluate alternative design concepts, and recommend a preferred conceptual design to advance forward and proceed through preliminary and detailed design. The report includes a desktop review of existing information which will be verified during the preliminary design stage of this project.

1.2 System Constraints and Opportunities

The Project will replace or twin the existing 620 m long 1050 mm diameter trunk sewer, herein referred to as the Fairview Cove Trunk Sewer. This sewer links the 2100 x 1700 mm concrete lined Bedford Highway Interceptor Sewer tunnel (upstream) with the 1800 mm diameter North End Interceptor Sewer tunnel (downstream) through the Fairview Cove Area. Flows conveyed through the Fairview Cove Trunk Sewer are received at the Duffus Street Pumping Station. Refer to Attachment 1 (overleaf) for an overall site plan. The West Region Wastewater Infrastructure Plan (GM Blueplan, 2017) identified that the 1050 mm diameter Fairview Cove Trunk Sewer is a hydraulic constraint in the interceptor system. Therefore, to provide continuity in the conveyance capacity between the existing tunnels, this section of trunk sewer is planned to be modified to increase its hydraulic capacity.

Currently, during wet weather the existing 1050mm trunk sewer is a hydraulic restriction causing a backup of the interceptor system and resulting in overflows through the combines sewer overflows (CSOs) located along the interceptor and trunk sewer, and maintenance holes on the Bedford Highway. It is expected that improving the hydraulics to the interceptor system will result in additional flow to the Duffus Street Pump Station. Pumping station capacity and other downstream impacts (e.g., Duffus Street CSO) will be considered by others.

The new trunk sewer must connect the Bedford Highway Interceptor Sewer tunnel and the North End Interceptor Sewer tunnel. The slope of the line will be a function of existing inverts at the connection points. The existing Bedford Highway Interceptor Sewer tunnel (upstream) runs at a slope of 0.10% and has a terminus invert elevation of -1.661 m geodetic (94.55 ft Halifax Datum). The North End Interceptor Sewer tunnel (downstream) has a slope of 0.21% with a starting invert of -3.365 m geodetic (88.96 ft Halifax Datum). The existing Fairview Cove Trunk Sewer is shown with a slope of 0.15%, a total length of 617.4 m and total vertical drop of 0.927 m (3.04 ft). The new sewer alignment will generally fall along the south side of the CN main track and will be longer than the existing trunk sewer as a result. However, there appears to be a vertical drop of 1.704 m available between the tunnels which is greater than 0.927 m vertical utilized by the existing Fairview Cove Trunk Sewer. As a result, there is an opportunity for a similar, or greater slope on the new trunk sewer, depending on the length of alignment.

The existing 1050 mm Fairview Cove Trunk sewer has three combined sewer overflows (CSOs) which will be referred to as Kempt Road Inlet Regulation (MacLaren MH #3), Bayne Street Inlet Regulation (MacLaren MH #5) and Mackintosh Rd Overflow. Flows to the Fairview Cove Trunk Sewer through Kempt and Bayne Street CSOs are regulated by 450 mm diameter piping that restricts flows into the Fairview Cove Trunk sewer during high flow events. Excess flows are diverted to the adjacent storm system and ultimately discharge to the Bedford Basin. The Mackintosh CSO is a primary overflow relief along the tunnel system and consists of an overflow weir that overflows to the Bedford Basin when the system is surcharged.

1.3 Project Area and Land Use

The project area is bounded by the CNR main tracks and Fairview Cove Container Terminal to the north, Bedford Highway and the Mackay Bridge Connector to the south, and the North End Interceptor Sewer tunnel to the East. The project area is also constrained by a number of landowners including: CNR, Halifax Port Authority (HPA) and their tenants, Nova Scotia Transportation and Infrastructure Renewal (NSTIR) and its tenant, Halifax Regional Municipality, and private land owners (commercial and residential). HPA Tenants include Cerescorp, which operates the Fairview Cove Container Terminal, and Abassatours Gray Line Ltd. HPA has a long-term lease agreement with the NSTIR lands for which it sub-leases to Cerescorp.

The lands are currently developed and have been impacted by historical uses. Each landowner and property have specific constraints including: land use, future development, existing infrastructure, buildings. Historical uses of these lands include aboveground hydrocarbon storage tanks, railway right-of-way, incineration, and highways maintenance garages. Anecdotally, it is believed that some of these lands have also been used for solid waste transfer and it is understood that creosote contamination was found on NSTIR lands.

HRM is in the design stage for a new transportation depot on lands adjacent to the existing depot with construction anticipated in 2020. Redevelopment of the existing

HRM MacKintosh Depot lands (PID 00019612) may provide for more flexible options for locating tunnel access shafts within these lands. Specific stakeholder and land use constraints are discussed further in Section 2 of this report.

1.4 Utilities

There are a number of utilities in the project area including: storm, sewer, water, gas transmission, underground communication/power, and overhead communications and power. The new Fairview Cove Trunk Sewer Tunnel will generally be lower than most buried utilities with depths of cover to the new sewer varying from a low of approximately 4.4 m in the NSTIR Lands to as much as 30 metres at the east end of the project area, depending on alignment. However, there are two large storm ducts (2700 x 2100 and 2750 x 1850) in the NSTIR lands where the separation from the top of the Tunnel to the bottom of the storm ducts will be limited. There are also two 900 mm diameter lateral spurs that connect the existing 1,050mm Trunk Sewer to the Kempt and Bayne Street Inlet regulation CSO's with inverts similar to the existing trunk sewer. Therefore, the spurs that cross a new trunk sewer alignment will be in conflict with some of the proposed tunnel alignments. The inlet regulation occurs upstream of the spurs; however, construction would be constrained by the need to maintain flow in these spurs during construction.

A Nova Scotia Power (NSP) high voltage power transmission line transverses the project area generally following the CN main track. Two NSPI towers are located within the project area which constrain alignments due to required offsets from the towers.

Halifax Water has an existing 900 mm diameter water transmission main located within an unlined (open rock face) tunnel that borders the project area. An existing shaft at the southeast corner of the NSTIR lands provides access to the water tunnel. Alignments that are in proximity to the water tunnel infrastructure will need to consider impacts to the existing water tunnel. Halifax Water is currently planning to decommission or twin the existing water transmission main via the construction of a new water transmission main. The new water transmission main routing will fall within a similar project area and routing as the new sewer tunnel within NSTIR lands. However, construction of the new transmission main is planned for after the construction of the sewer tunnel and is not anticipated to constrain the design of the new Fairview Cove Trunk Sewer tunnel. Possible integration of the aspects of the water transmission main (i.e. a CN crossing using trenchless methods) will be considered in further stages of the Fairview Trunk Sewer design.

2 DESIGN CRITERIA

2.1 Sanitary Sewer

2.1.1 Reference Design Standards and Guidelines

The design and installation of the trunk sewer and its system components will be in accordance with the following:

- Halifax Regional Water Commission (HRWC) Design Specification and Supplementary Standard Specification for Water, Wastewater and Stormwater Systems, 2018 Editions
- Nova Scotia Environment (NSE) requirements
- HRWC Act
- HRWC Regulations and applicable bylaws
- West Region Wastewater Infrastructure Plan (WRWIP)

Specific to the trunk sewer design:

- Minimum self-cleansing velocity should be 0.60 m/s
- Maximum velocity should be 3.0 m/s
- Maximum length of sewer section should be subject to review with respect to access and operational constraints

2.1.2 Wastewater Main Material

Based on HRWC Design Specification and Supplementary Standard Specifications, potential materials of the trunk sewer include:

- Polyvinyl Chloride (PVC) pipe and fittings type PSM to CSA B1800
- Reinforced concrete pipe to ASTM C76M or CSA A257.2, used only in large diameter applications as approved by the Engineer
- Polyethylene pipe and fittings to AWWA C901 or AWWA C906, used only in special circumstances as approved by the Engineer
- Polypropylene pipe and fittings to AWWA C901 or AWWA C906, used only in special circumstances as approved by the Engineer

Although not listed as an approved pipe material, for the proposed design concept, a 1200 mm sewer installed via microtunnel at depth up to 23 m, concrete Class V (140D) microtunnelling pipe is recommended. This type of pipe is commonly used for this application.

Fiberglass jacking pipe may also be considered. In such case, the design of the pipe will include calculation of the earth loads and the effects of concentrated and distributed superimposed (live) loads on the carrier pipe considering jacking forces on installation and long-term effects of earth loading and potential rock squeezing.

Special coatings or concrete admixtures may also be considered to combat H₂S biogenic corrosion if warranted.

2.1.3 Existing Sanitary Sewer Flows

Details for existing flow information are summarized in Table 1. A map of Halifax Water's Flow Monitors located in close proximity upstream of the Fairview Cove Trunk Sewer is provided in Attachment 2.

Table 1 Flow Monitoring Summary Data

Flow Monitor	Start Date (YYMMDD)	End Date (YYMMDD)	Max Velocity (m/s)	Average Velocity (m/s)	Max Flow (L/s)	Average Flow (L/s)
FG498	181203	190429	0.5	0.0783	143.5	14.4
FG449	181101	190429	1.2	0.4	265.1	34.5
FG19	181101	190429	2.7	0.9366	351.2	69.7
FG426	181101	190429	2.0	0.9509	536.9	117.8
Total Observations					1,296.7	236.4

It is recognized that these flow measurements do not account for all of the flows that reach the existing 1050 mm trunk sewer, as there are contributing catchment areas that do not have flow monitors. Nevertheless, testing the sanitary sewer design at conceptual level, from upstream connection point (Bedford Highway Interceptor Sewer tunnel) to downstream connection point (North End Interceptor Sewer tunnel) (without evaluating individual sewer sections), reveals that the existing 1050 mm trunk sewer does not have sufficient capacity for the existing peak flows (see Table 2 for details).

Table 2: Existing Sanitary Sewer Flows

Location	Total	Dia.	Slope	Length	Capacity	Actual	Full Flow	Ratio
Manhole From To	Flow (l/s)	(nominal) (mm)	(%)	(m)	(L/s)	Velocity (m/s)	Velocity (m/s)	Q/Q full
Bedford Highway Interceptor Sewer tunnel USMH DSMH	1296.7	1050	0.28	617.4	1434.6	1.95	1.66	0.90
North End Interceptor Sewer tunnel								

2.1.4 Downstream Capacity Considerations

It is recognized that the proposed system improvements may provide conveyance of greater capacity than the downstream system can currently accommodate, including the Northend Interceptor, the Duffus St Pumping Station and the Halifax Wastewater Treatment Facility. There are no downstream upgrades incorporated into this study and it is expected that the downstream system constraints will become the future limiting factor in the operation of system.

2.1.5 Sanitary Trunk Sewer Sizing

The minimum trunk sewer size shall be in accordance with the HRWS Design Specification and Supplementary Standard Specifications and it must provide for flow projections through to 2046.

System constraints are evaluated and infrastructure planning is accomplished for the Halifax Water sewer network via modelling, and it was determined (GM BluePlan 2017) that the new Fairview Cove Trunk Sewer shall be:

- a minimum size of 1800 mm if replacing the existing 1050 mm sewer; or
- a minimum size of 1200 mm diameter if operating in parallel with the existing 1050 mm sewer.

Hydraulic review of the existing 1050 mm diameter trunk sewer and its appurtenances along Fairview Cove will be completed during preliminary design. This analysis will provide estimation of changes in overflow via existing piped connections from the sewer system to Bedford Basin.

2.1.6 Operations

Operational concerns will be explored further during preliminary design. Primary considerations include:

- Maintaining minimum flows in the existing trunk sewer to achieve self-cleansing
- Intercepting or connecting to the existing combined sewer overflows
- Odour generation potential
- Tunnel access for maintenance

It is recommended that Operations personnel should be included among parties providing input through the design phases.

2.1.7 Odour Control

There are currently no odour concerns generally in this area, however, the addition of additional sewer from Bedford West and Beechville-Lakeside-Timberlea (BLT) could result in a differing condition resulting in some odour generation. Source of potential odour release could be turbulent mixing and grade changes which can release H₂S from

the wastewater. Accordingly, the design will provide best practice to limit grade changes and turbulence within the new sewer tunnel and at the connection points. Samples will be collected during low flow periods to determine the odour generation potential of the wastewater currently entering the Fairview Cove system during detail design.

2.2 Existing Subsurface Condition

2.2.1 Regional Geology

Figure 1 illustrates Bedrock Geology Map of the Halifax area prepared by White et. al. in 2014. A larger scale geology map excerpt of the project area is shown in Figure 2.

The project alignment is located within Goldenville Group of bedrock comprising of two subgroups of Beaverton Formation and Taylor Head Formation. The Goldenville Group occurs in the northern and eastern side of the Halifax map area and consist of grey to greenish-grey, thickly bedded metasandstone, locally interlayered with green to grey, cleaved metasilstone and rare black slate. Metasandstone beds range from <0.5 m to several metres in thickness, whereas metasilstone and slate beds are typically <0.5 m thick. Sedimentary structures are generally lacking in the metasandstone. Towards the stratigraphic top of this unit, metasilstone beds are more abundant and metasandstone beds are thinner. Sedimentary structures, such as ripple marks, cross-bedding, graded-bedding, and fluke/sole marks, are more common (White et. al. 2007). The approximate location of one fault is indicated on this map. Based on observations made during construction of North End Feeder (NEF) tunnel the potential for the presence of another fault is inferred.

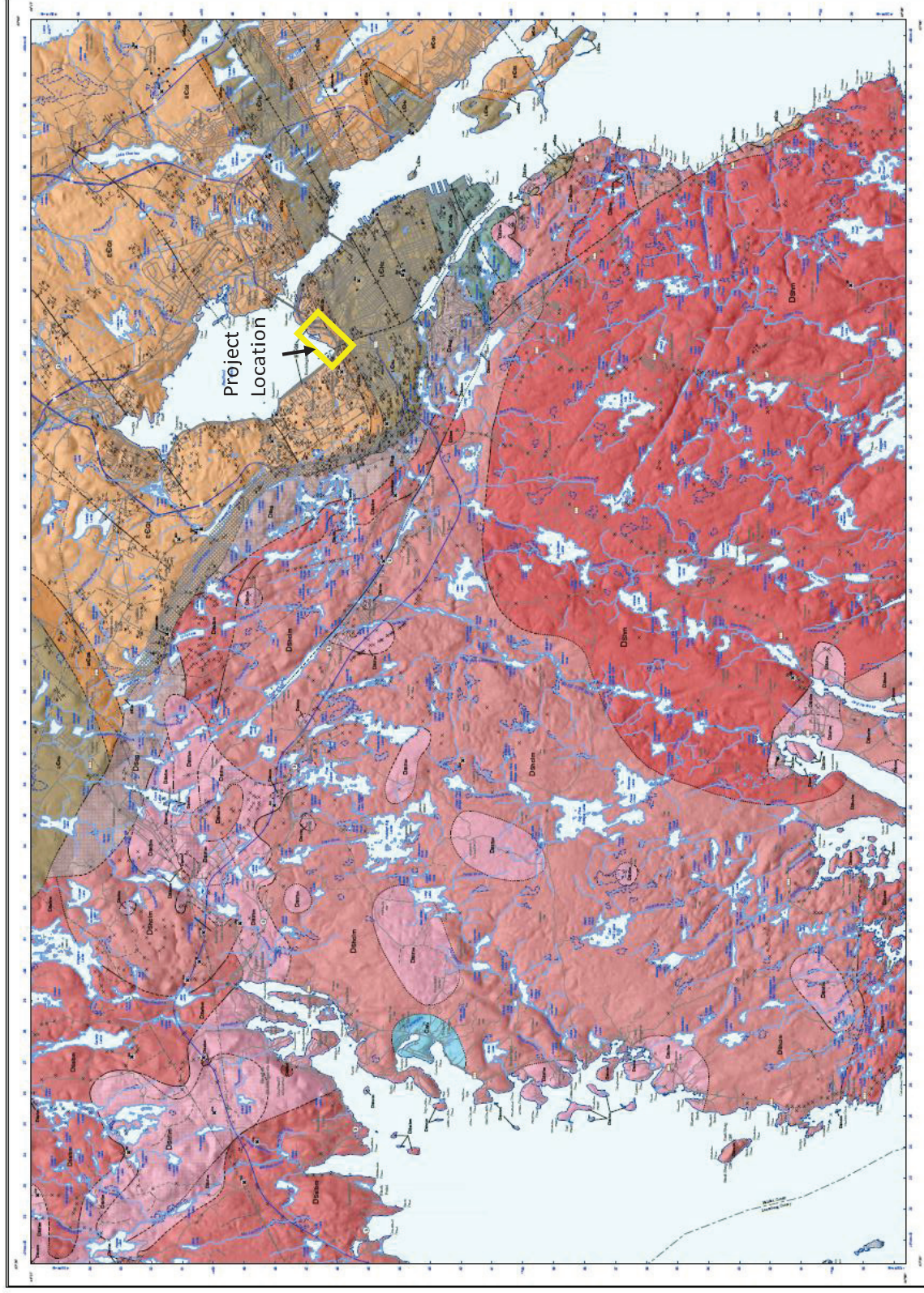


Figure 1 Bedrock Geology of Halifax Area (White et. al., 2014)

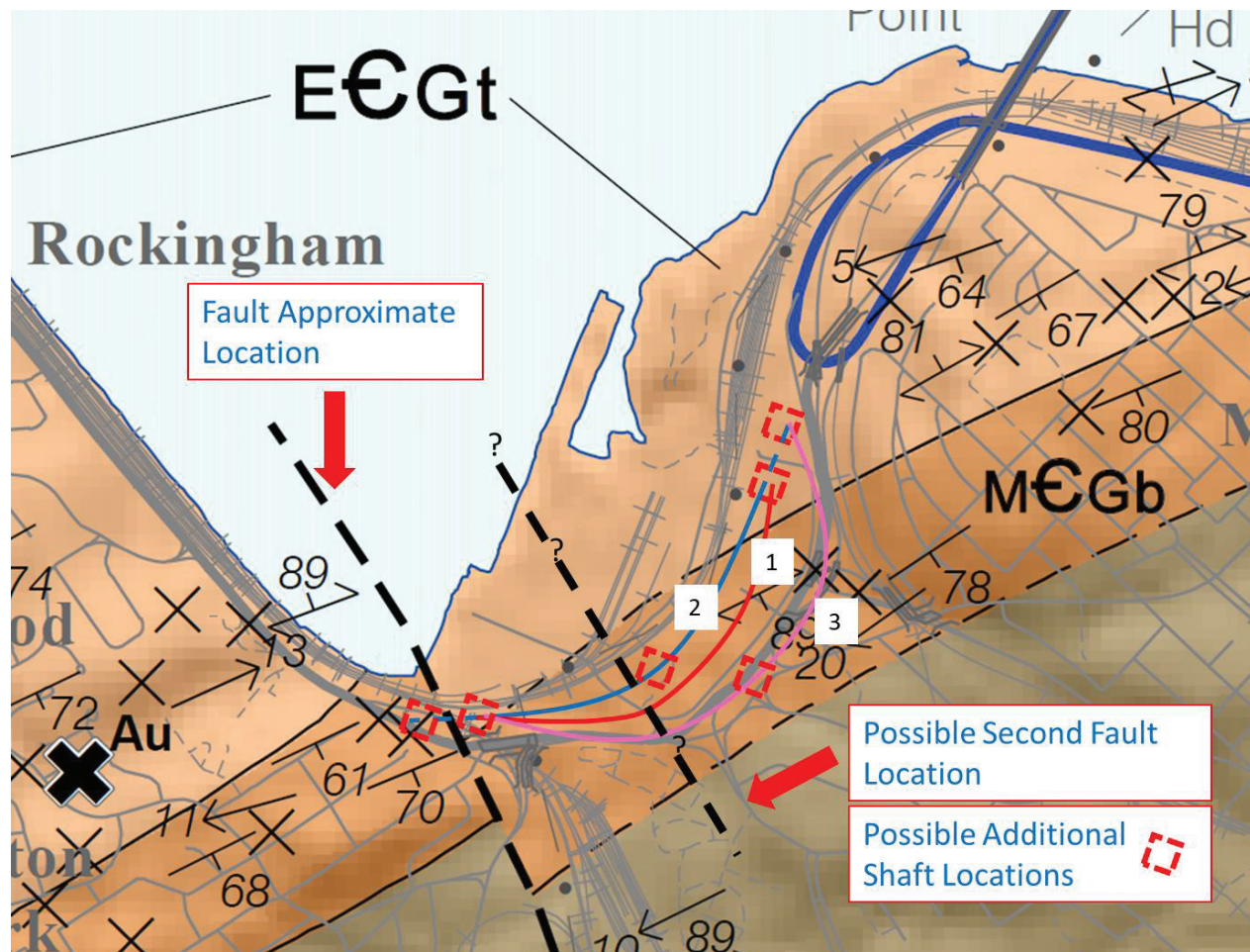


Figure 2 Larger Scale Bedrock Geology at the Project Location

2.2.2 Ground Profile and Water Table

A complete desk study of available historical field investigations was performed using the following documents as the main sources of information:

- North End Feeder – Tunnel Section, by R. McAlpine Ltd. For Public Service Commission of Halifax, Pockwock Water Supply, Halifax, NS, 1974.
- Subsoil Investigation, North End Feeder Tunnel Route, Pockwock Water System, Maritime Testing Ltd., Halifax, NS, January 1974.
- North End Feeder Tunnel, As-Built Drawings, Peninsula Water System for Public Service Commission of Halifax, Halifax, NS, 1974-1979.
- Bedford Highway Interceptor Sewer, Record Drawings, CANPLAN Consulting Limited, Halifax, NS, 1975.
- Fairview Overpass Project, Record Drawings, FENCO, Halifax, NS, 1981.
- Phase II Environmental Site Assessment HPA Fairview Cove Lumber Yard, Strum, Halifax, NS, April 26, 2010.

- Halifax Harbour Solution Project, Geotechnical Investigations for Land Based Tunnels, Halifax/Dartmouth, Jacques, Whitford and Associates Limited, NS, July 8, 2000.
- Halifax Approaches, Design Drawings, Sheet 1/3, Pratley and Dorton, Halifax Dartmouth Bridge Commission, Halifax, NS, 1971.

Figure 3 shows a plan view of selected previous geotechnical boreholes based on closest proximity to the project location. Ground profile, bedrock elevation and water table are inferred based upon these boreholes for the proposed conceptual alignments as presented in Section 3. Figure 4 illustrates the NEF tunnel ground stratigraphy which provides a preliminary evaluation of the ground profile anticipated. Based on the available information the following general observations can be made:

- Overburden. Comprises of fill and native soil up to 5 m deep overlying bedrock of Slate and Metasandstone.
 - Overburden comprises loose to very dense silty gravel, sand till, and mixture of cobbles/boulders/sand and silt.
 - At one location (the Robie St interchange adjacent to Bayne Street) presence of sandy Clay was reported.
- Boulders. Encountered in borings as large as 0.9 m as recorded at the project location.
- Bedrock Weathering. A layer of highly weathered bedrock is anticipated on top of the fresh to slightly weathered bedrock up to 1.5 m in thickness.
- Top of Rock. Bedrock depth is anticipated to be deeper at the west end in comparison with the east end.
- Rock Quality. Highly fractured zones are expected within rock mass especially at in the vicinity of possible fault locations.
- Groundwater. Water level is recorded at relatively shallow depth between 1 m to 4 m deep below grade. Bedrock is anticipated to be water bearing.

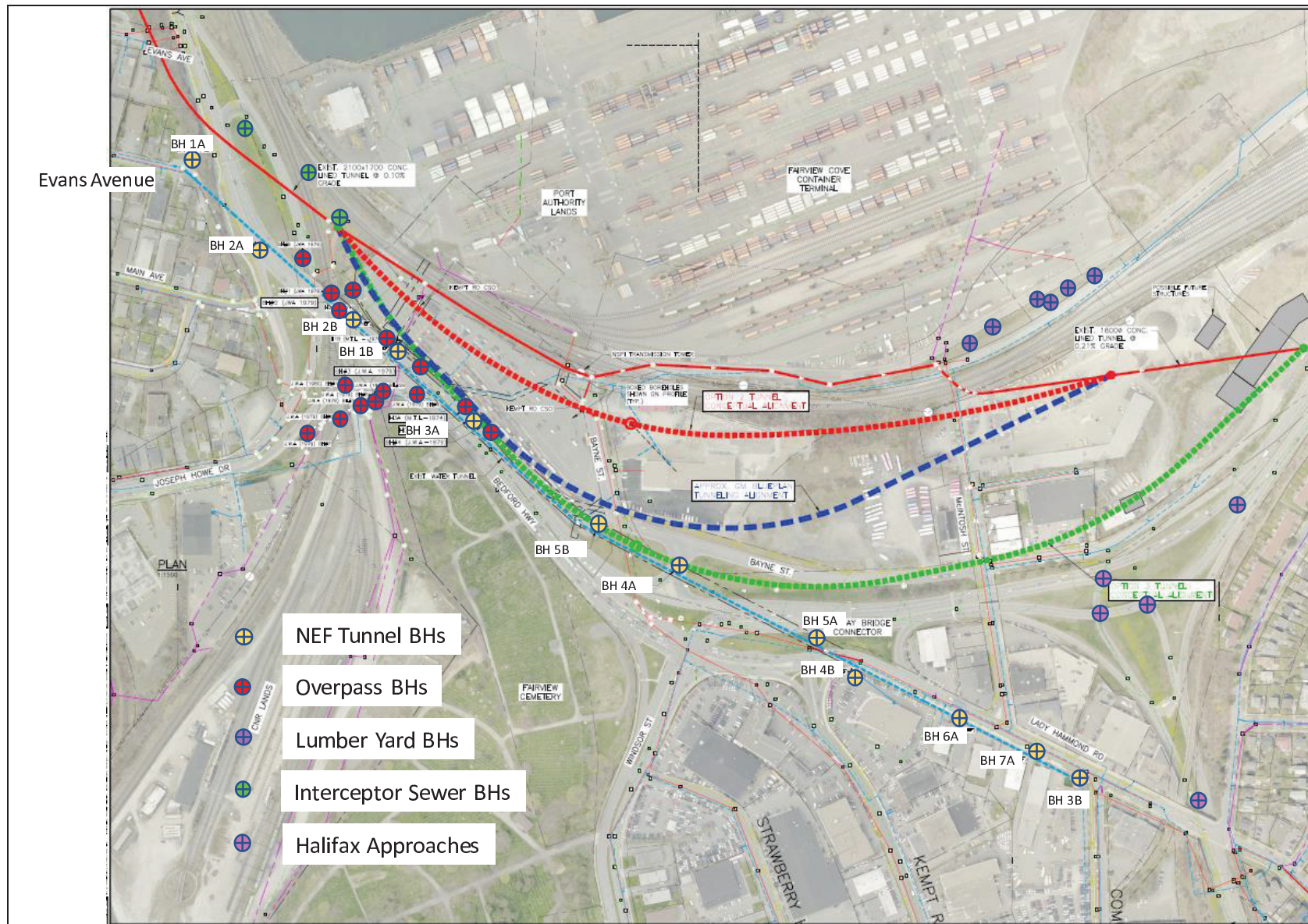


Figure 3 Plan View of Previous Geotechnical Boreholes Collected from Available References

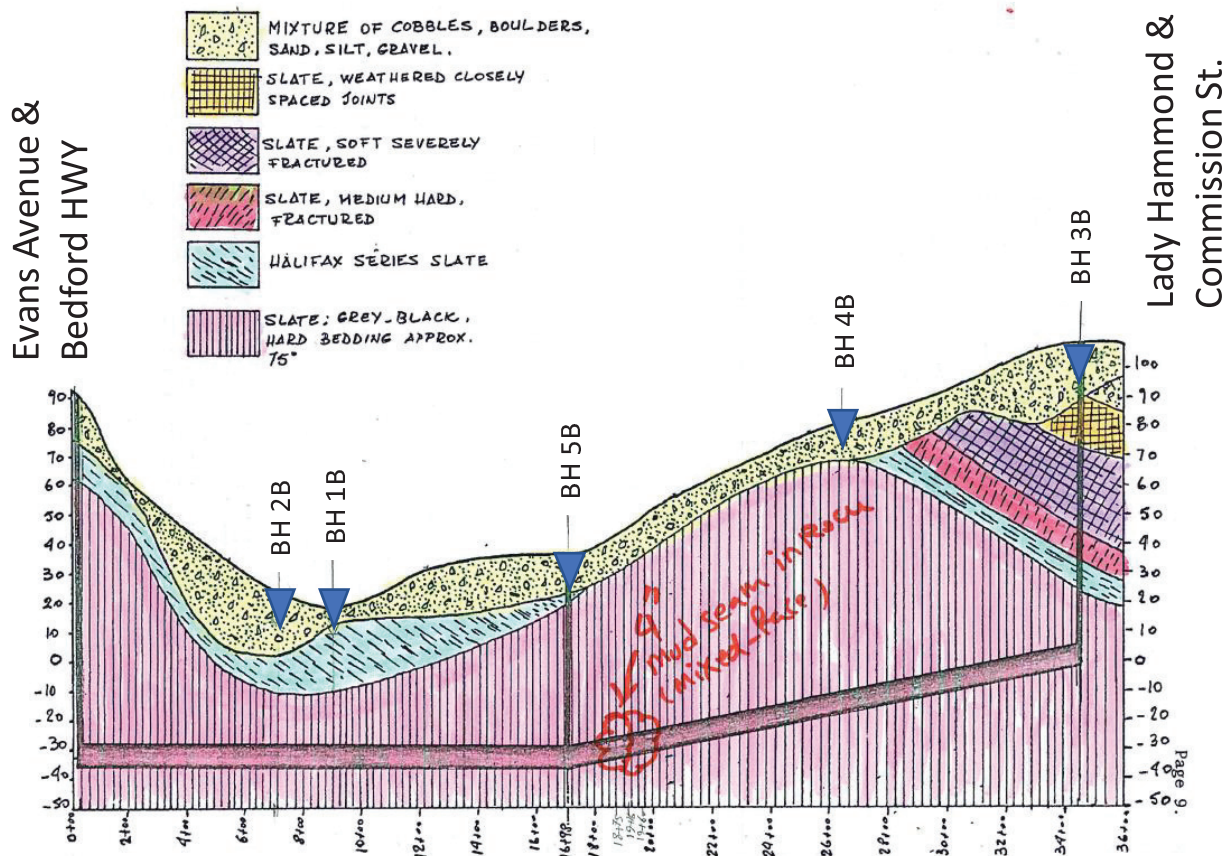


Figure 4 Ground Profile Along the NEF Tunnel Axis (NEF Tunnel Section, 1974)

2.2.3 Overburden and Bedrock Characteristics

As previously discussed, granular overburden soils are expected at the site location. The challenges associated with this type of ground conditions that need to be addressed properly during tunneling and shafts excavation are as follows:

- Groundwater. Presence of water within granular material was recorded.
- High Permeability. Presence of granular material may result in high water inflow during shaft excavation.
- Ground Support. Unstable ground (limited stand-up time) to be supported by adequate Support of Excavation (SOE).
- Protection of Adjacent Structures. Horizontal and Vertical settlement to be minimized to mitigate for construction induced impacts at utility, road, and structure crossings within the construction zone of influence.

Bedrock comprising predominantly of Slate is expected along the project alignment. Figure 5 shows an example of instability due to bedrock discontinuities. General intact and rock mass properties based upon geotechnical information collected during past projects are as follows:

- UCS - 9-160 MPa (Weak to Very Strong) – mostly between 25 to 88 MPa.
- Density - 27-28 kN/m³
- RQD - 0-100% (Very Poor to Excellent)
- RMR - 50-70 (Fair to Very Good Rock)
- Permeability - 1x10⁻⁶ cm/s to 3x10⁻⁴ cm/s, typically in the 10⁻⁵ cm/s range
- Abrasivity - Slate, CAI 0.19 (very low abrasivity), Meta-Siltstone, CAI 2.4 to 3.55 (High Abrasivity)
- Acid Rock Drainage (ARD)

Risks associated with underground construction (shafts and tunnels) within Slate to be eliminated during detailed design stage are:

- Hard Layers. Presence of hard layers interbedded within Slate with higher UCS and abrasivity
- Weak Layers/Poor Rock Quality. Impact of low RQD rock mass and presence of mud seams within the Slate
- Mixed Face. Presence of both soil and rock (mixed face ground) within the excavation envelope.
- Shear Zones. Location and extents of Shear Zones
- Rock Mass Quality. Presence and distribution of poor quality rock (e.g., rock blocks, Figure 5)
- Gas. Presence of combustible gas – to be investigated.
- Time-Dependent Deformation (TDD) – to be investigated.
- In-Situ Stress/Swelling – to be investigated.

There are additional risks pertaining to Acid Rock Drainage (ARD) (White et. al. 2013), including:

- Contamination. Environmental contamination, mostly in the form of ARD with the transfer of large amounts of acidity and potential dissolved metals into the surface and groundwater systems.
- Water Quality. Degradation of water quality.
- Corrosion. Excessive premature corrosion of concrete and metal infrastructure
- Hazardous Material. Rocks having sulphide contents equal to or greater than 0.4 wt. % are considered as hazardous ARD material (Ref: Sulphide Bearing Material Disposal Regulations, 1995).
- Disposal. Excavated bedrock to be handled to prevent the production of acid drainage.



Figure 5 Example of bedrock discontinuities/blocks

2.2.4 Faults

As shown on Figure 2 two faults are anticipated at the project location. Where faults are located, the bedrock is anticipated to be highly fractured which leads to higher volume of water inflow, instable face of excavation and possibility of mixed face. Location and extent of the fault zones needs to be identified during the detailed geotechnical investigation.

The presence of water bearing open cut excavations at tie-in location (upstream and downstream) and possible intermediate CSO tie-in locations need to be designed to account for the site-specific ground conditions.

2.3 Microtunnel

2.3.1 General Methodology

Microtunnelling (MT) is a steerable, remotely controlled, guided technique of installing pipeline by consecutively pushing pipes and Microtunnel boring machine (MTBM) through the ground using a jacking system for thrust. MT requires shafts construction to

launch and receive the MTBM at two ends of each drive. Figure 6 illustrates an example of slurry MTBM built by Herrenknecht manufacturer (AVN series). Slurry MTBM convey mucks from a crusher/excavation chamber situated immediately behind the cutting wheel/face using conveying fluids. Slurry MTBM provides face pressure counterbalancing the in-situ stress which controls ground loss into the face of excavation. Summary of MT major advantages are:

- Continuous Ground Support – The carrier pipe jacked in place immediately and continuously as tunnel excavation progresses limiting surface settlement potential.
- MTBM Face Pressure - Positive face support is provided through pressurized slurry which counteract earth and water face pressures and further limits surface settlement.
- MTBM Cutterhead - cutterhead and cutting tool configuration design can be optimized for expected ground conditions (soil, mixed face of soil and rock and bedrock).
- MTBM Overcut – design of overcut to limit frictional resistance and ability to effectively mine curved drives.
- Automated Guidance System and MTBM Articulation Joint – ability to steer the MTBM through curved and composite curved alignments.
- Access to the Face – For MTBM 1200 mm and larger access to the face of excavation is available which makes cutting tools replacement and maintenance possible.
- Automated Lubrication System – reduces jacking loads between the casing pipe and ground.
- High Installation Accuracy – MT can install the casing with accuracy of less than 1% which is essential with gravity lines where grade and tin-in points has limited room for deviations.



Figure 6 Slurry Microtunnel Machine

2.3.2 Drive Length

Table 3 provides achievable drive length corresponding to certain pipe diameter using MT approach. Longer drives are achievable using automated lubrication, continuous guidance system and Intermediate Jacking Station (IJS). IJS can be located inside casing pipes along length of tunnel to be driven to increase jacking force needed. IJS will be controlled and linked to total system to match excavation rate of the MTBM shield.

Table 3 Microtunnel Construction – MTBM Diameter vs Drive Lengths (No IJS & with IJS)

Pipe ID (mm)	Typical Drive Length without IJS (m)	Typical Drive Length with IJS (m)
1200	600	800
1350	700	900
1500	800	1000
1800	1150	1500

It should be noted that even for drive lengths less than the “Typical Drive Length without IJS” the Contractor and/or Design Engineer may elect to add IJS’s close to the MTBM as a risk mitigation measure.



Figure 7 Intermediate Jacking Station

2.3.3 Radius of Curvature

For smooth MT operation radius of curvature above 400 m is recommended. Tighter curvatures have been achieved however more skilled MT operator and additional costs

of pipe manufacturing will be added to the project constraints. For tight radius drives additional requirements have to be considered for pipe manufacturing such as shorter pipe length or skew ended pipe or specialized joints.

With larger joint articulation angles under tighter curve radii (Figure 9), regular timber based joints between MT pipes, may quickly reach their limits, which means that only significantly reduced jacking forces can be transferred from pipe to pipe without damaging the pipes. As a result, the Microtunnel performance can decrease decisively when taking this into account. Joint articulation angles between the jacking pipes arise not only as a result of a curved alignment but also as a result of steering movements of the machine, as a result of changing geological conditions and also due to manufacturing tolerances of the jacking pipes. The characteristic, irreversible behaviour of a wooden pressure transfer ring leads to stress concentrations on the inside of an articulated pipe joint that can exceed the material strength if handled inadequately while no pressure is transferred on the outside of the articulated joint, because it is gaping (Figure 8). As a further consequence, the resulting jacking force acts eccentrically on the articulated jacking pipe. Due to the moment equilibrium, the pipe is pushed against the surrounding soil, inducing lateral bedding forces B. These lateral bedding forces superimposed to the external actions (soil load, earth pressure, water pressure and traffic loads) in radial direction. The research conducted on reinforced concrete jacking pipes have shown that these lateral bedding forces B represent the main cause of the most frequently observed pipe damages.

The use of hydraulic joints such as Jack Control System (JCS) improves stress distribution under tight curvature which results in decrease of stress level and allows for longer drive. Figure 10 compares stress distribution of regular joints and specialized hydraulic joints. JCS was first used in Canada for West Don Sanitary Trunk Sewer project by Ward and Burk for the City of Toronto. The project included installation of 1200mm ID RCP sewer 350 m long drive with tight curvature of 250 m. Shafts were 20m deep with 15 m water head which imposes considerable in-situ stress on joints.

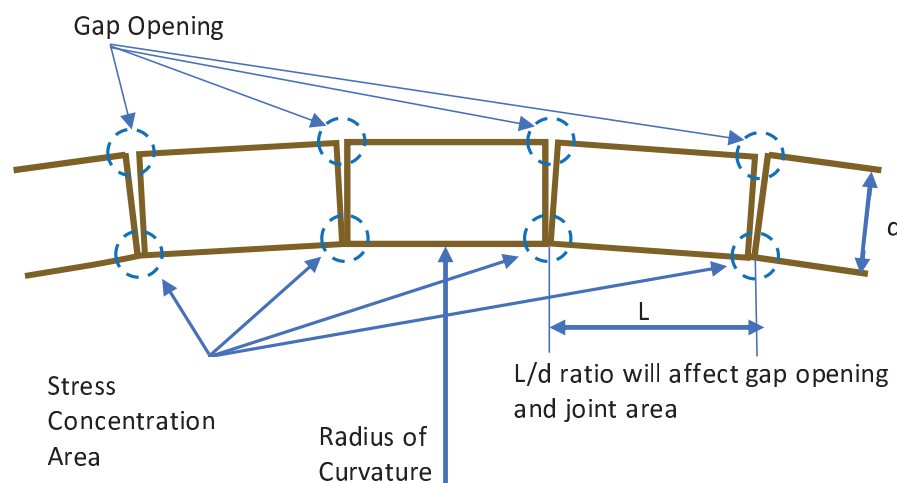


Figure 8 Radius of Curvature and Pipe Joints Articulation

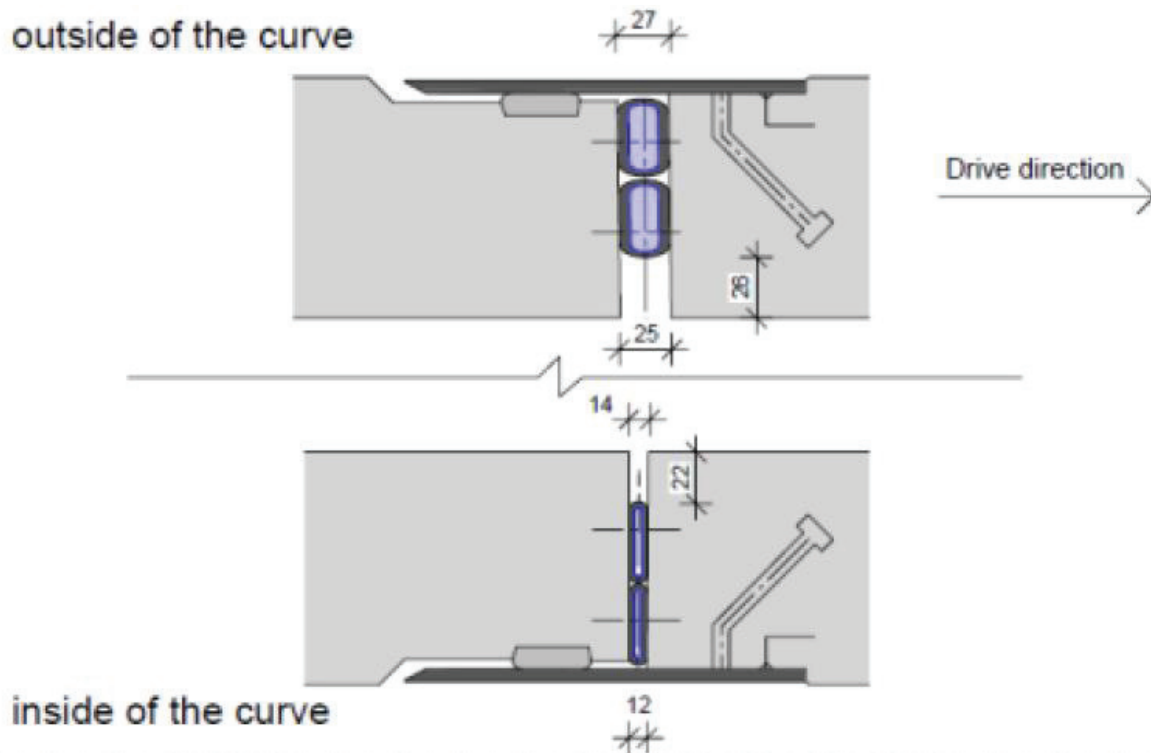


Figure 9 Joint Articulation Under Tight Curvature

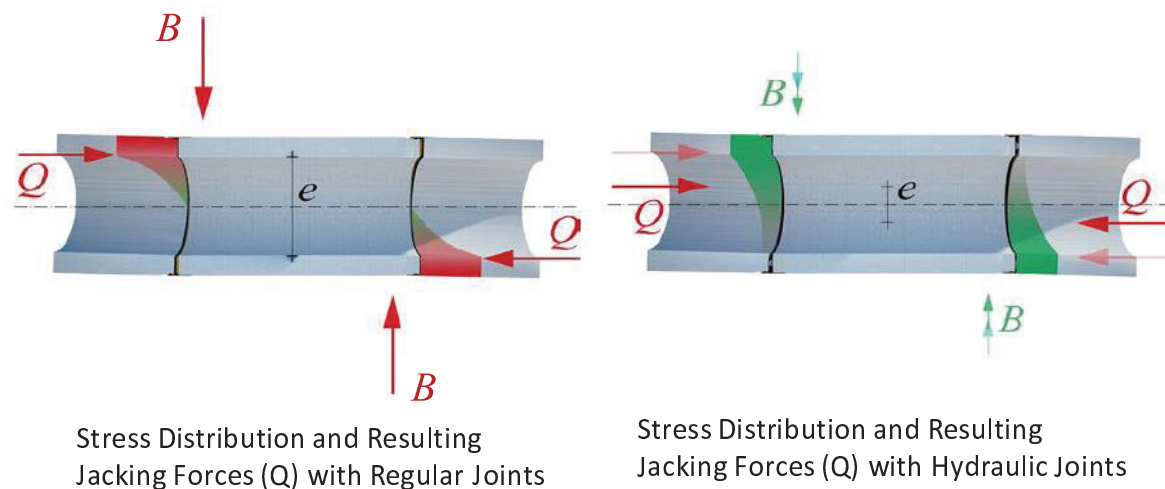


Figure 10 Stress Distribution Around the MT Pipe Joints under Curved Alignment – Regular Joints Vs Hydraulic Joints

2.3.4 Applicable Ground Condition

MT is applicable to a variety of ground conditions as shown in Table 4. Desk study of available geotechnical investigation at the vicinity of the project shows that the Microtunnelling is expected to be dominantly within bedrock of Slate interbedded with Metasandstone and Metasiltstone. The tunnel alignment is expected to be within slate starting at the east end and remains dominantly within bedrock for the majority of the

profile. Depth of overburden increases at the west end of the project. Presence of granular overburden of sand and silt with cobbles and boulders is anticipated at the face of the tunnel excavation on the west side. Therefore, transition from bedrock to soil, mixed face of rock and soil, is anticipated as tunnel boring gets close to the west end.

The bedrock falls into category of weak to very strong with UCS value of 9 to 160 MPA recorded. Microtunnel is being successfully used for bedrock excavation within this range of UCS. The MTBM cutting head will need to be adjusted to suite the bedrock characteristics over the length of the excavation.

Since MT maintains face pressure, tunneling in water bearing granular material and water bearing fractured bedrock can be managed with minimized ground loss into the face of excavation. The method is watertight and therefore no dewatering is required for tunnelling. Boulders can be problematic depends on their frequency and size, by impacting steering capability, causing excessive wear of cutting blades and obstructing the boring operation. Proper identification of number of boulders and extend can help the contractor to select proper tooling. Having access to the face of excavation also provide great help to remove obstruction or replace the cutting tools when needed.

Table 4 Microtunnelling Applicable Ground Condition

GROUND TYPE	APPLICABILITY
soft to very soft clays, silt, and organic deposits	○
medium to very stiff clays and silts	○
hard clays and highly weathered shales	○
very loose to loose sands (below water table)	○
very loose to loose sands (above water table)	○
medium to dense sands (below water table)	○
medium to dense sands (above water table)	○
gravels and cobbles less than 50-100 mm diameter	○
soils with significant cobbles, boulders, and objects larger than 100 – 150 mm diameter	●
weathered rocks, marls, chalks, and firmly cemented soils	○
significantly weathered to unweathered rocks	○

○ YES ● NO ● MARGINAL APPLICABILITY

2.3.5 Shafts Laydown Areas and Construction

Figure 11 illustrates typical microtunnel site arrangements and MTBM configuration. Launch shaft sites require larger laydown area which can be approximately 1000 m² to 2000 m². Laydown areas at exit shafts are typically smaller in comparison requiring approximately 800 m² to 1500 m².

During site visits, areas were identified as potential locations for tunnel shafts. The west end of the alignment would require a tunnel shaft within CN ROW which has relatively limited space available due to an overpass bridge crossing. A launch shaft is proposed to be located at the east end of the project. Two possible shaft locations have been selected; the location will depend on the selected tunnel alignment. Figure 12 presents two areas as mentioned both provide enough space required for laying down Microtunnelling equipment (Figure 11). Figure 13 illustrates potential locations at the west end for exist shafts. Street view for each location is also presented. The triangular area has relatively flat topography which make this location more suitable. The rectangular area, between Bedford Highway and Joseph Howe Dr, is located on a steep slope which make this location less favorable. Figure 14 shows an aerial view of potential location for intermediate shaft if required. Number of shafts and their location will be finalized during preliminary stage of the design.

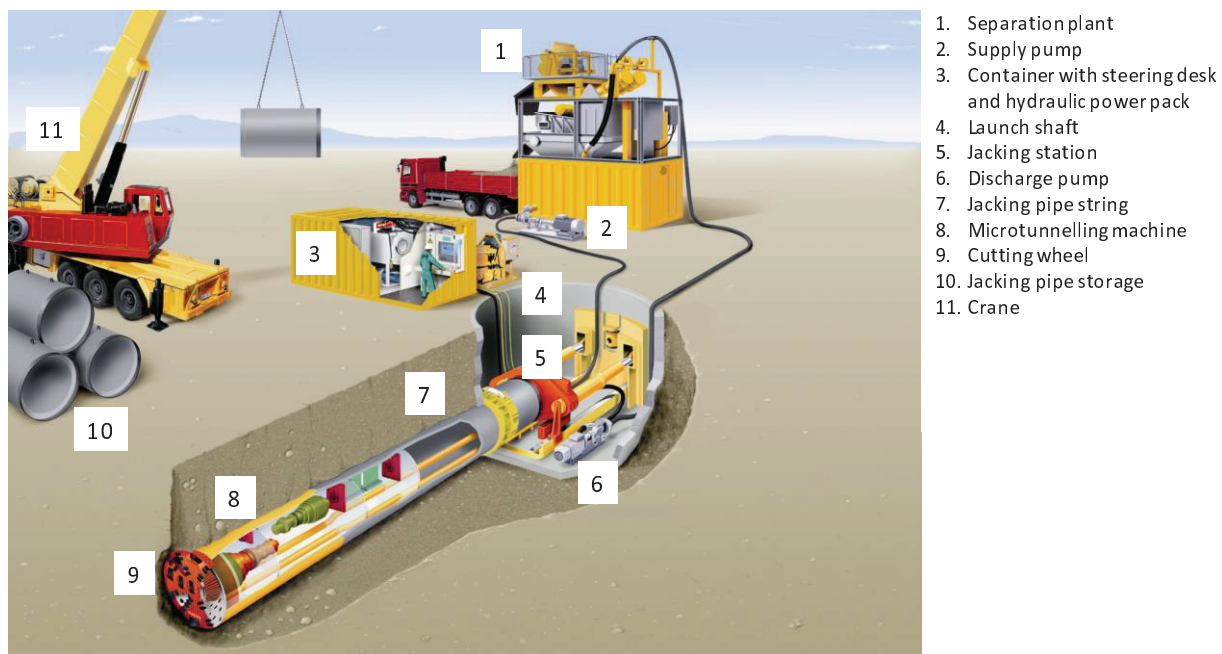


Figure 11 Typical Microtunnel Launch Shaft Layout



Figure 12 Potential Launch Shafts Area (West End of Tunnel)



Figure 13 Potential Locations for Receiving Shafts (East End of Tunnel)



Figure 14 Potential Locations for an Intermediate Shaft if Needed

There are several approaches available to construct a tunnel shaft Support of Excavation. There are several factors in selecting the most suitable SOE method such as the presence and elevation of the groundwater table, is dewatering allowed, type of ground, space availability, contractor's past experience. Previous site record of tunnel and shafts construction for North End Feeder (NEF) tunnel showed high volume of ground water inflow into the shaft and tunnel. To illustrate the high volume of water anticipated, Figure 15 shows a picture of the existing 900 mm diameter water transmission main located within an unlined (open rock face) tunnel that borders the project area.



Figure 15 NEF tunnel Post Construction Photo

The key considerations for shaft design are as follows:

Shaft Siting - available land & space, Staging area requirements, site access & traffic control, required space for support equipment, underground utilities (location, depth, & alignment), overhead utilities (location & alignment), noise, vibration, dust, and fumes considerations/impacts to surrounding public/businesses, access requirements, employee parking requirements, wheel wash location, muck disposal (storage & haulage routes), contamination presence (soil/groundwater), water treatment requirements and plant location.

Shaft Size - shaft type (launching/jacking, retrieval/receiving, or drop shaft), shaft shape (circular or rectangular) space for frames, utilities, stairs, vents; initial & final lining (pipe, concrete segments, initial support), space for welding/connections, spoil handling method, pumping equipment, utilities (power, water, slurry etc.)

Shaft Design - temporary structure vs. permanent structure (temporary shaft support designed to become part of permanent structure), required size to effectively perform work, required/necessary excavation support method (non-watertight or watertight), groundwater control requirements, loads/pressures on support systems (soil/rock, water, live, & surcharge), thrust resistance for launching MTBM, and launch and entry requirements (seals or grouted blocks), special measures to prevent loss of ground during MTBM entry and exits to shafts, mechanical seals (inside shaft wall) and/or grouted blocks (outside shaft wall), provide support to mitigate for surface settlement and inflow of flowing soils and groundwater into the shafts and inundating the tunnel construction operation.

Shaft Groundwater Control – Sealed method which requires no dewatering, well points, eductor well point system, deep wells, sump pumps, ground freezing, & groundwater cut-off.

A summary of the various shaft construction methods available in the marketplace and applicability based upon diameter, depth, and ground conditions is presented in Table 5.

Table 5 Primary Considerations for Shaft Construction Method

Type	Size and Shape	Typical Depth	Type of Ground	Watertight	Remarks
Soldier Piles and Wood Lagging (or Steel Plates)	Any size (width limited only by	20m	Any	No	Used above groundwater; limited cantilever depth; sequential excavation and lagging installation
Liner Plates	Any size (up to 10m dia.)	30m	Soil with stand-up time	No	Flexible; adaptive to various sizes; can be expensive

Type	Size and Shape	Typical Depth	Type of Ground	Watertight	Remarks
Conventional Excavation with Rock Dowels and Shotcrete	Any size: up to 8m dia. (deep); up to 15m dia. (shallow)	300m+(deep), 65m (shallow)	Rock	No	Flexible; adaptive to various sizes; relatively low cost
Interlocking Sheet Piles	Any size (width limited only by internal bracing)	15m	Most soils but trouble in cobbles and boulders and hard rock	Yes	Can be reused; inexpensive; used below groundwater; limited by crossing utilities; predrilling required in rock or boulder rich ground
Secant Piles	Circular (up to 10m dia.)	30m	Most soils and weak rock	Yes	High cost; requires specialized equipment; limited by crossing utilities, Not suitable for hard rock
Drilled Shafts	Circular (up to 10m dia.)	65m	Most soils and weak rock	Yes	High cost; requires specialized equipment; limited by crossing utilities
Pre-Cast Concrete Segments	Any size (up to 10m dia.)	40m	Most soils and Rock	Yes	Typically, part of the permanent works; can be used below the water table; limited by crossing utilities
Caissons	Any size (up to 10m dia.)	40m	Most soils and Rock	Yes	Typically, part of the permanent works; can be used below the water table; limited by crossing utilities

The Caisson method of shaft construction has been used successfully by microtunnel contractors, and typically offers significant advantage in terms of surface space requirements and more rapid shaft construction. The method is sealed and does not require dewatering. Table 5 presents minimum launch and exit shaft size requirements for different sizes of the MTBM. Depending on final location of the shafts, acceptable approaches will be evaluated. For example, if the design requirements identify a deep launch shaft at the east end, predominantly, bedrock is anticipated at that location. In this circumstance using rock bolts and shotcrete could be more economical. As discussed, granular material of sand and gravel is anticipated along the height of the exit shaft at the west end of the project which makes Caisson method more favorable approach.

2.4 Other

2.4.1 Utilities and Agencies

The location of this project is within an industrial area that sees heavy truck traffic as well as freight trains and HRM service vehicles. An important part of the design process will be identifying access requirements as limiting truck or rail traffic at one of the busiest container terminals in Eastern Canada will not be acceptable.

Other utility providers including NSP, Bell, Eastlink, Heritage Gas, will also to be contacted to confirm locations of utilities. All utility companies will be contacted to provide locates prior to conducting survey work to allow for utilities to be picked up in the survey in both plan and profile.

The utility owners and requirements anticipated in this corridor include:

- | | |
|---|--|
| <ul style="list-style-type: none"> • Canadian National (CN) Railway | CN work permit (within 30 ft., 9 m from centreline of outermost track)

Flagging/cable (within 30 ft., 9 m from centerline of outermost track)

Permit for geotechnical field work |
| <ul style="list-style-type: none"> • Nova Scotia (NS) Power | Call/Click Before You Dig (request underground power line locates)

Overhead Safe Clearance/Cable Locate Request |
| <ul style="list-style-type: none"> • Heritage Gas | Gas line locate request |
| <ul style="list-style-type: none"> • Halifax Port Authority | Permit requiring Board Approval |
| <ul style="list-style-type: none"> • Nova Scotia Environment (NSE) | Wastewater and Sewage Disposal – Application for Approval (applicable for 3 years) |
| <ul style="list-style-type: none"> • Transportation and Infrastructure Renewal | Boreholes ROW Permit

Highway ROW Permit

Structures/Retaining Wall Permit |

2.4.2 Local Stakeholders and Property Owners

The work scope will require construction of access shafts at both ends of the tunnel and possibly one more along the tunnel route. The modification of the sewer system will require approvals and permits from landowners and regulators. There could be three or more access points, one at the north end, one in the middle, and one at the south end. Property owners that will be affected by this work include CNR, NSTIR, the Port Authority, and HRM. Subject to selection and refinement of the preferred alignment there are some private property owners in the area that may also be affected.

Discussions have commenced with all public sector property owners and key stakeholders to introduce the project and discuss the preliminary conceptual alignments. Discussions will continue throughout the design process to apprise property owners and stakeholders and to evaluate property impacts for the preferred alignment.

2.4.3 Property Requirements

As is typical for utility construction, property requirements can be satisfied for short-term (e.g., temporary during construction) and long-term needs by way of acquisition, easement, lease or licence. Utility easements may be further classified as aerial, surface or subterranean depending on the nature of the utility requirement. For this assignment, it is presumed that property requirements will be satisfied by licence, surface easement or subterranean easement, as may be negotiated with the applicable property owner.

Licence

A licence for the use of real property gives permission (usually contractually) for one party to occupy another party's property in a specified manner for a specified period of time, that would otherwise be considered trespassing. It is expected that some form of licence agreement with CN will be required for any encroachment on CN-owned property, covering all construction and maintenance matters, and adhering to CN standards. The anticipated form of agreement will have negotiated elements pertaining to access, duration and renewability, among other things. A nominal amount has been assumed to be applicable for a licence fee.

Surface Easement

A surface easement is the most common form of property right associated with underground utility infrastructure, and it safeguards the utility by constraining any development or construction that may occur above it on the corresponding ground surface. Furthermore, a surface easement provides for potential access to the utility from the surface for any future repair or maintenance as may become necessary. The preferred easement requirement for this project, a trunk wastewater main, would be minimum 12 m in width along the sewer alignment, in accordance with the HRWS Design Specification and Supplementary Standard Specifications.

Surface easements however have the greatest potential to impact the use or utility of the affected property, thereby typically requiring compensation to offset the burden that encumbers the land. For the purpose of this exercise, a price of \$161 per square metre was used for preliminary costing, in accordance with recent property valuations. It is assumed that surface easements will be applicable for all property requirements that have no apparent surface impact.

Subterranean Easement

A subterranean easement is similar to a surface easement in that it safeguards the underground infrastructure, but only at a prescribed depth or elevation, and with no surface entry or surface use rights that a surface easement otherwise protects. The premise of a subterranean easement is that no activity on the surface (or to the prescribed depth) will adversely impact the underground infrastructure, and conversely that the affected property derives its value exclusively or nearly so from the surface utilization of the site (or to some definable depth). If these conditions are true for both existing and future land use conditions (i.e., highest and best use) then a subterranean easement may be appropriate and should demand lesser compensation when compared with a surface easement. There are examples of subterranean easements that have been established along the existing Bedford Highway Interceptor Sewer tunnel. The valuation assumed for subterranean easements is \$75 per square metre. It is assumed that subterranean easements will be applicable for all property requirements that have apparent surface impacts, e.g., existing or future building.

The most common form of property right associated with underground utility infrastructure such as a tunnel is a surface easement, as it provides protection of the infrastructure by constraining any development or construction on the ground surface above it.

2.4.4 Traffic Management

The access shafts are currently proposed to be on CNR lands and HRM lands with access to the CNR lands through the Port Authority lands. The Port Authority operates 24hrs per day while ships are in port. During this time no disruption to traffic flow would be acceptable. The project team will engage the Port Authority to determine how construction can be managed when a ship is in.

CNR have strict regulations about working within their ROW and require spotters to be present. There may be a need for work to stop within the ROW when trains pass the site. Engaging CNR to determine their requirements will be important in evaluating routing options as well as generating tender documents that fully outline CNR requirements in terms of working limitation but also costs associated with spotters.

HRM will be impacted at their Public Works Garage and could also be impacted if the tunnel is moved closed to Bedford Highway. Conversations with HRM indicate that one lane closure with a reversing am/pm lane might be acceptable or narrowing the lane width temporarily to maintain four lanes. Other options could also be considered and

discussed with HRM. The area around the Public Work Garage will be difficult to work in as this area has heavy traffic. It is also possible that this building will be replaced with a new building to the north. Once the new building is built the existing building will be demolished. The new building is currently under design and it could be constructed prior to the construction commencement of the Fairview Cove Trunk Sewer tunnelling project, which would help eliminate this issue. Discussion with HRM on timelines and impacts to the tunnel project and their project will be important to have early on in the project to allow for routing options to account for the location of the new building.

2.4.5 Environmental Impacts

Based on the historic data there are a number of potential contaminants of concern at these locations including petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), metals, volatile organic compounds (VOCs), glycols, phenols and PCBs. To assess the environmental condition of the soils at the Launching and Receiving Sites the project team will collect two (2) soils samples from the geotechnical boreholes located in these areas during the subsequent geotechnical investigation. A report presenting the findings of the field program will be provided which will identify contaminants of concern, location of approved disposal sites, and a unit rate disposal cost. Any relevant information will be relayed through the design to the contractor.

3 CONCEPTUAL DESIGN OPTIONS

3.1 Horizontal Alignment and Vertical Profile Options

The conceptual design options have been developed following the original preliminary concept (GM BluePlan 2017), denoted as Option 1, together an option that runs as close to the harbour as possible (subject to minimum CNR offset), denoted as Option 2, and an option that endeavours to stay as much as possible in existing road ROW, denoted as Option 3. Options 2 and 3 are further split into curved (A) and straight (B) alignments

A plan view drawing of the curved microtunnel alignment options 1, 2A and 3A is provided in Attachment 3 to provide contextual overview of the design concepts. For convenience, 'Project North' has been defined as a - 45° rotational offset. The west shaft is located between multiple CN tracks, between Joseph Howe Dr. and the Fairview Container Terminal, directly connected to the existing 2100x1700 mm diameter concrete lined tunnel. The east shaft is located approximately 143 m east (perpendicular to MacKintosh St.) and 87 m north (parallel to MacKintosh St.) from the intersection of MacKintosh St. and Forrester St.

Curved alignment options 2A and 3A share a common shaft location at the project west end. The common west shaft location is located on CN property, between multiple CN tracks, between Joseph Howe Dr. and the Fairview Container Terminal, offset 13.6 m south of the existing 2100x1700 mm diameter concrete lined tunnel.

The east shaft location of alignment 2A (curved) is located approximately 82 m east of MacKintosh St. along Forrester St. and 78 m north of Forrester St. Alignment 3A (curved) has a distinctive shaft location at the east end of the project located approximately 331 m east (perpendicular to MacKintosh St.) and 75 m north (parallel to MacKintosh St.) from the intersection of MacKintosh St. and Forrester St. The east and west shaft locations of the straight alignments, options 2B and 3B, are the common with their associated curved option shaft locations. However, both Options 2B and 3B require an additional shaft located near Bayne St.

The horizontal alignment and vertical profile options for the straight and curved alignment options will be identified hereunder, inclusive of alignment specific concerns and constraints.

3.2 Option 1 Curved

A conceptual alignment was completed by others as part of the Increased Capacity of the Trunk Sewer along Fairview Cove Conceptual Design Technical Memorandum dated November 2017. This memorandum evaluated trenchless construction techniques to increase the capacity of the Fairview Cove trunk sewer. Trenchless technologies included in the evaluation were Horizontal Auger Boring (Jack and Bore), Axis-Guided Boring, Horizontal Directional Drilling (HDD), and Microtunnelling. The recommended method of construction was microtunnelling for the construction of a new 893 m long, 1200 mm diameter trunk sewer with an arc radius of 285 m.

A plan view drawing of the option 1 curved alignment is provided in Attachment 3, along with curved alignment options 2A and 3A. The curved trunk sewer alignment for option 1 begins westerly on CN property and travels easterly closely parallel to a concrete retaining wall associated with the Fairview Overpass. It continues in close proximity to the Ambassadors Gray Line facility and travels beneath HRM's Western Operation facility as well as HRM's proposed MacKintosh Depot building 55 m west of HRM's existing MacKintosh Depot building. The alignment passes through properties owned by NSTIR, Halifax Port Authority, leased land by Ambassadors Gray Line, and land owned by Halifax Regional Municipality.

The depth of the alignment beginning west is approximately 8 m to 9 m, travelling east at depths of approximately 14 m to 16 m. Although it is possible to construct a microtunnel at these depths underneath existing infrastructure, it is recommended wherever possible to avoid alignments beneath existing or planned infrastructure to avoid access constraints for maintenance or repairs. The alignment of the sewer should also consider its intersection through a property to minimize property impact with regards to future construction works and reduction in economic property value.

3.3 Option 2A Curved

Due to infrastructure constraints and land encumbrance in option 1, curved alignment 2A was developed to mitigate the sewer travelling underneath existing or future planned infrastructure. Based on stakeholder communications with the Halifax Port Authority, it was understood that the land leased to the Ambassadors was to remain unhindered as much as possible. Therefore, the purpose of alignment 2A was to remain as close as possible to the north property line. (See Attachment 4.)

As discussed earlier in this report, the preferred radius of curvature for a constructible microtunnel is greater than 400 m in any section of the alignment. Alignment 2A was to maintain a radius of curvature greater than 400 m and it was recently identified that a distance of 10 m away from the base of Nova Scotia Power high voltage tower is to be maintained. This 10 m offset will be revised on the preliminary design drawings.

The curved trunk sewer alignment for option 2A begins westerly on CN property and travels easterly, underneath the Ceres security building, runs parallel to CN tracks and travels beneath HRM's existing paint shop. The alignment passes through properties

owned by NSTIR, Halifax Port Authority, leased land by Ambassadors Gray Line, CN Lands, and land owned by Halifax Regional Municipality.

The depth of the alignment beginning west is approximately 8 m to 9 m in depth travelling east at depths of approximately 14 m to 16 m. Although it is possible to construct a microtunnel at these depths underneath existing infrastructure, it is recommended wherever possible to avoid alignments beneath existing or planned infrastructure to avoid access constraints for maintenance or repairs. The alignment of the sewer should also consider its intersection through a property to minimize property impact with regards to future construction works and reduction in economic property value.

3.4 Option 2B Straight

To allow for a larger bidding pool of contractors with capabilities of constructing only straight microtunnel(s) and to mitigate some risk pertaining to constructability, alignment option 2B was developed. The east and west shaft locations of the straight alignment option 2B are common with the shaft locations of the curved alignment option 2A. A third shaft is required and is located in the southwest portion of the HRM Future Depot Lands (PID 41358037).

It is understood that the bidding pool of qualified contractors capable of constructing curved microtunnel alignments is smaller than that of straight alignments. However, the straight alignment 2B shown in Attachment 5 has additional risk due to its crossing underneath existing and proposed future buildings and infrastructure.

The straight trunk sewer alignment for option 2B begins westerly on CN property and travels easterly, parallel to the Ceres security building, underneath the Ambassadors building and underneath HRM's proposed MacKintosh Depot building.

The alignment passes through properties owned by NSTIR, Halifax Port Authority, leased land by Ambassadors Gray Line, and land owned by Halifax Regional Municipality.

The depth of the alignment beginning west is approximately 8 m to 9 m in depth travelling east at depths of approximately 14 m to 16 m.

3.5 Option 3A Curved

Due to infrastructure constraints, land encumbrance, and easement requirements in alignments 1, 2A and 2B, curved alignment 3A was developed. The majority of this alignment travels away from CN tracks apart from its west shaft location, does not travel underneath existing or proposed future infrastructure, does not intersect property which would decrease its economic value, follows the existing road structure, and has a radius of curvature of approximately 465 m. (See Attachment 6.)

The curved trunk sewer alignment for option 3A begins westerly on CN property and travels easterly, closely parallel to a concrete retaining wall associated with the Fairview Overpass, has an intermediate jacking station within the road boulevard between Bayne St. and Bedford Highway, runs closely parallel to an existing highway overpass, is in close proximity to the private property of Bird Stairs Plumbing, Heating and Electrical, and has an east shaft located within HRM's property currently being used for above ground storage.

The alignment passes through properties owned by NSTIR, and land owned by Halifax Regional Municipality.

The depth of the alignment beginning west is approximately 8 m to 9 m in depth travelling east at depths of approximately 30 to 35 m.

3.6 Option 3B Straight

To allow for a larger bidding pool of contractors with capabilities of constructing only straight microtunnel(s), alignment option 3B was developed, shown in Attachment 7. The east and west shaft locations of the straight alignment option 3B are common with the shaft locations of the curved alignment option 3A. A third shaft is required and is located in traffic island between Bayne Street and Bedford Highway.

The straight trunk sewer alignment for option 3B begins westerly on CN property and travels easterly, parallel to a concrete retaining wall associated with the Fairview Overpass, underneath the Ambassadors building, and underneath HRM's proposed MacKintosh Depot building, below the existing Depot and closely adjacent to the HRM White Building (Paint Shop).

The alignment passes through properties owned by NSTIR, leased land by Ambassadors Gray Line, and land owned by Halifax Regional Municipality.

The depth of the alignment beginning west is approximately 8 m to 9 m in depth travelling east at depths of approximately 30 to 35 m.

4 EVALUATION CRITERIA

The following evaluation criteria were used to facilitate a quantitative evaluation of the five (5) alignment options. Each criterion has an associated weighting with regards to its importance and impact to the project.

4.1 Evaluation method

Evaluation criteria including constructability, stakeholders, property, risk, ground conditions, cost, environmental, and schedule further described in Section 4.2, were used to develop a numerical comparison of the five (5) alignment options. Each criterion has an associated weighting from 1 to 5, with 1 being the least critical and 5 being the most critical with regards to its influence to the project. The alignment option scores are also rated from 1 to 5, with 1 having the greatest impact and 5 having the least impact.

Through the evaluation process, the lowest score will reveal the least preferred option and the highest score will reveal the most preferred option.

Table 6 below includes the evaluation criteria and assigned criticality weighting for each evaluation criterion. Subsequent alignment option scores relative to the evaluation criteria are assigned in Section 5.

Table 6 Alignment Evaluation Table

Evaluation Criteria	Criticality Weighting
Constructability	5
Property	3
Risk Mitigation	4
Ground Conditions	3
Cost	5
Environmental	5
Schedule	3

The resulting evaluation scores from the Alignment Evaluation Table 6 are then provided in a visual summary table and are further discussed in Section 5.

4.2 Evaluation criteria

4.2.1 Constructability

The constructability of each alignment options is primarily impacted by the radius of curvature and the microtunnel drive length. As discussed in Section 3, a decrease in radius of curvature, tangential changes in alignment and longer microtunnel drive

lengths directly impact the constructability of the microtunnel as the alignment becomes more complex and a high skill level from a qualified contractor is required.

Constructability has a criticality weighting of 5.

4.2.2 Stakeholders

This category assesses the impact to key stakeholders directly related to each alignment option.

As stakeholder engagement is a key aspect of this project, this category has a criticality weighting of 4.

4.2.3 Property

The property weighting is based on the alignments' impact to the properties it intersects, including its reference to property line. Accordingly, property is a key influence to the alignment options, but it is anticipated that property licences or easements can be managed and reasonably negotiated.

Property has a criticality weighting of 3.

4.2.4 Risk

The risk is evaluated based on the key criteria identified during the comparative risk workshop held on 10 April 2019. The risk evaluation for the alignments include its horizontal alignment underneath existing or proposed infrastructure, proximity to underground utilities, proximity to overhead power lines, proximity to highway retaining wall, proximity to existing structures, microtunnel curvature and drive length(s), mixed face tunnelling conditions, potential for obstructions, encountering sulphide bearing strata during excavation, encountering soil contamination predominantly during shaft excavation, damage to buildings in close proximity to the alignment, operational impacts, easements, permits, impact to North End Interceptor Sewer tunnel, proximity to CN rail, and risk of obtaining an unqualified contractor.

Risk has a criticality weighting of 4 and a high rating indicates a lower anticipated effect.

4.2.5 Ground Conditions

The ground conditions category includes a desktop review of the existing borehole information to analyze each alignment option. It is anticipated that alignments closer to the harbour or with less cover will be susceptible to increasingly variable or uncertain ground conditions.

Ground conditions has a criticality weighting of 3.

4.2.6 Cost

A cost model was developed to estimate the construction cost for each of the five (5) alignment options. The cost consists of 2 (two) categories: for property costs and construction costs. Property cost factors include cost to obtain a licence, surface easement, subsurface easement, and acquisition as applicable. Construction cost factors include shaft depth (with the option to include an intermediate shaft), microtunnel drive length, microtunnel premium (for long microtunnel drive lengths that require increased diameter), connections to existing utilities (upstream, downstream, and intermediate locations as applicable), restoration at the shaft locations (including intermediate shaft location as applicable), mobilization and demobilization, and contingency.

Cost has a criticality weighting of 2.

The template for cost model is provided in Table 7 below.

Table 7 Option Cost Model, Class D

Option	X
---------------	----------

CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ -
Shaft 1		vm	\$ 50,000	\$ -
Shaft 2		vm	\$ 50,000	\$ -
Shaft 3		vm	\$ 50,000	\$ -
Microtunnel		m	\$ 5,600	\$ -
Microtunnel Premium (curved)		m	\$ 1,000	\$ -
Microtunnel Premium (dia. driven by length)		m	\$ 4,100	\$ -
Connections Upstream		vm	\$ 20,000	\$ -
Downstream		vm	\$ 20,000	\$ -
Intermediate 1		vm	\$ 20,000	\$ -
Intermediate 2		vm	\$ 20,000	\$ -
Restoration 1		sq m	\$ 100	\$ -
Restoration 2		sq m	\$ 100	\$ -
Restoration 3		sq m	\$ 100	\$ -
Mob/demob	1		10%	\$ -
Construction Contingency	1		25%	\$ -
Total Construction Cost				\$ -
Engineering Upset Limit				\$ -
Halifax Water Project Management and Administration				\$ -
Grand Total				\$ -

4.2.7 Environmental

It is believed that some of these lands in the subject area have been used for solid waste transfer and that creosote contamination has also been found. Accordingly, any excavation, including spoils removal from the microtunnel operation, may be found to be contaminated, requiring special disposal. Impacts are expected to increase for alignments closer to the harbour and for options requiring intermediate shafts (due to the sheer volume of excavated material).

Environmental has a criticality weighting of 5.

4.2.8 Schedule

Although schedule impact does have overall importance and needs to accommodate other potential projects such as the HRM depot and future HRM road projects, there have been no critical deadlines established for completion of the proposed trunk sewer. Accordingly, a relative rating was applied among the options.

Schedule has a criticality weighting of 3.

5 EVALUATION OF CONCEPTUAL DESIGN OPTIONS

The design options have been evaluated by the project team in accordance with the preceding evaluation criteria.

In Sections 5.1 to 5.5 below, the evaluation categories with scores less than or equal to 2 (two) for each alignment are discussed as they are considered as fundamental impacts to the alignments' overall score.

It is anticipated that the impact of alignments travelling beneath HRM's Western Operation facility (The "White Building" or paint shop) is manageable as it is understood HRM plans to demolish this building after the redevelopment of HRM's proposed MacKintosh Depot building.

5.1 Option 1 Curved

Option 1 has ratings less than or equal to 2 (two) in most evaluation categories as shown in Table 8. This alignment has lower ratings in the evaluation categories of constructability, stakeholder acceptability, property, risk mitigation, and environmental. Alignment 1 has a radius of curvature of 285 m which is considerably less than the preferred microtunnel radius of 400 m for constructability purposes. As discussed in Section 4, this alignment option produces high stakeholder impact as the alignment directly intersects various properties and travels beneath proposed infrastructure. Although the alignment travels beneath HRM's Western Operation facility, this detail has been negated in the evaluation as it is anticipated that this building will be demolished as previously mentioned. The ability to mitigate risk of this alignment option is minimal due to its radius of curvature and alignment underneath proposed infrastructure.

A summary of option 1 evaluation scoring is provided in Table 8 below.

Table 8 Option 1 Evaluation Table

Evaluation Criteria	Criticality Weighting	Option1
		Score
Constructability	5	2
Property	3	1
Risk Mitigation	4	2
Ground Conditions	3	4
Cost	5	3
Environmental	5	2
Schedule	3	3

A breakdown of the cost model for option 1 is provided in Table 9 below.

Table 9 Option 1 Cost Model

Option	1			
CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ 1,233,000
Shaft 1	9	vm	\$ 50,000	\$ 450,000
Shaft 2	15	vm	\$ 50,000	\$ 750,000
Shaft 3	0	vm	\$ 50,000	\$ -
Microtunnel	893	m	\$ 5,600	\$ 5,001,000
Microtunnel Premium (curved)	893	m	\$ 1,000	\$ 893,000
Microtunnel Premium (dia. driven by length)	0	m	\$ 4,100	\$ -
Connections Upstream	9	vm	\$ 20,000	\$ 180,000
Downstream	15	vm	\$ 20,000	\$ 300,000
Intermediate 1	0	vm	\$ 20,000	\$ -
Intermediate 2	0	vm	\$ 20,000	\$ -
Restoration 1	800	sq m	\$ 100	\$ 80,000
Restoration 2	2000	sq m	\$ 100	\$ 200,000
Restoration 3	0	sq m	\$ 100	\$ -
Mob/demob	1		10%	\$ 786,000
Construction Contingency	1		25%	\$ 1,964,000
Total Construction Cost				\$ 10,604,000
Engineering Upset Limit				\$ 1,525,418
Halifax Water Project Management and Administration				\$ 85,873
Grand Total				\$ 13,448,291

5.2 Option 2A Curved

Option 2A has ratings greater than 2 (two) in most evaluation categories as shown in Table 10. This alignment has high ratings in all categories except environmental which is consistently scored for each alignment option. Alignment option 2A has high constructability rating as its radius of curvature is above 400 m and its drive length is considered reasonable for a curved microtunnel. This alignment option has minimal stakeholder impact as it travels along the stakeholders' property line and does not travel beneath proposed infrastructure. Although the alignment travels beneath HRM's Western Operation facility, this detail has been negated in the evaluation as it is anticipated that this building will be demolished as previously mentioned.

A summary of option 2A evaluation scoring is provided in Table 10 below.

Table 10 Option 2A Evaluation Table

Evaluation Criteria	Criticality Weighting	Option 2A Curved
		Score
Constructability	5	4
Property	3	3
Risk Mitigation	4	3
Ground Conditions	3	3
Cost	5	4
Environmental	5	1
Schedule	3	4

A breakdown of the cost model for option 2A is provided in Table 11 below.

Table 11 Option 2A Cost Model

Option	2A			
CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ 1,124,000
Shaft 1	9	vm	\$ 50,000	\$ 450,000
Shaft 2	15	vm	\$ 50,000	\$ 750,000
Shaft 3	0	vm	\$ 50,000	\$ -
Microtunnel	754	m	\$ 5,600	\$ 4,223,000
Microtunnel Premium (curved)	754	m	\$ 1,000	\$ 754,000
Microtunnel Premium (dia. driven by length)	0	m	\$ 4,100	\$ -
Connections Upstream	9	vm	\$ 20,000	\$ 180,000
Downstream	15	vm	\$ 20,000	\$ 300,000
Intermediate 1	8	vm	\$ 20,000	\$ 160,000
Intermediate 2	10	vm	\$ 20,000	\$ 200,000
Restoration 1	800	sq m	\$ 100	\$ 80,000
Restoration 2	2000	sq m	\$ 100	\$ 200,000
Restoration 3	0	sq m	\$ 100	\$ -
Mob/demob	1		10%	\$ 730,000
Construction Contingency	1		25%	\$ 1,825,000
Total Construction Cost				\$ 9,852,000
Engineering Upset Limit				\$ 1,525,418
Halifax Water Project Management and Administration				\$ 85,873
Grand Total				\$ 12,587,291

5.3 Option 2B Straight

Option 2B has ratings less than or equal to 2 (two) in some evaluation categories as shown in Table 12. This alignment has lower ratings in the evaluation categories of stakeholder acceptability, property and environmental. As discussed in Section 4, this alignment option produces high stakeholder impact as the alignment directly intersects various properties, travels beneath existing infrastructure and beneath proposed infrastructure. Although the alignment travels beneath HRM's Western Operation facility, this detail has been negated in the evaluation as it is anticipated that this building will be demolished as previously mentioned. The ability to mitigate risk of this alignment option is minimal due to its alignment underneath both existing and proposed infrastructure.

A summary of option 2B evaluation scoring is provided in Table 12 below.

Table 12 Option 2B Evaluation Table

Evaluation Criteria	Criticality Weighting	Option 2B Straight
		Score
Constructability	5	5
Property	3	1
Risk Mitigation	4	4
Ground Conditions	3	3
Cost	5	4
Environmental	5	1
Schedule	3	3

A breakdown of the cost model for option 2B is provided in Table 13 below.

Table 13 Option 2B Evaluation Table

Option	2B			
CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ 812,000
Shaft 1	9	vm	\$ 50,000	\$ 450,000
Shaft 2	15	vm	\$ 50,000	\$ 750,000
Shaft 3	18	vm	\$ 50,000	\$ 900,000
Microtunnel	821	m	\$ 5,600	\$ 4,598,000
Microtunnel Premium (curved)	0	m	\$ 1,000	\$ -
Microtunnel Premium (dia. driven by length)	0	m	\$ 4,100	\$ -
Connections Upstream	9	vm	\$ 20,000	\$ 180,000
Downstream	15	vm	\$ 20,000	\$ 300,000
Intermediate 1	0	vm	\$ 20,000	\$ -
Intermediate 2	0	vm	\$ 20,000	\$ -
Restoration 1	800	sq m	\$ 100	\$ 80,000
Restoration 2	2000	sq m	\$ 100	\$ 200,000
Restoration 3	800	sq m	\$ 100	\$ 80,000
Mob/demob	1		10%	\$ 754,000
Construction Contingency	1		25%	\$ 1,885,000
Total Construction Cost				\$ 10,177,000
Engineering Upset Limit				\$ 1,525,418
Halifax Water Project Management and Administration				\$ 85,873
Grand Total				\$ 12,600,291

5.4 Option 3A Curved

Option 3A has ratings less than or equal to 2 (two) in some evaluation categories as shown in Table 14. This alignment has lower ratings in the evaluation categories of risk mitigation, cost, environmental, and schedule. Option 3A produces a higher level of risk due to its longer curved microtunnel drive length of 1181 m. Although this option is constructible based on its curved length, it does however impose a greater risk with a drive length greater than 800 m. It is anticipated the project schedule would be affected by this option based on the complexity of this curved alignment.

A summary of option 3A evaluation scoring is provided in Table 14 below.

Table 14 Option 3A Evaluation Table

Evaluation Criteria	Criticality Weighting	Option 3A Curved
		Score
Constructability	5	3
Property	3	4
Risk Mitigation	4	2
Ground Conditions	3	4
Cost	5	1
Environmental	5	2
Schedule	3	2

A breakdown of the cost model for option 3B is provided in Table 15 below.

Table 15 Option 3A Cost Model

Option	3A			
CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ 947,000
Shaft 1	9	vm	\$ 50,000	\$ 450,000
Shaft 2	30.5	vm	\$ 50,000	\$ 1,525,000
Shaft 3	0	vm	\$ 50,000	\$ -
Microtunnel	1181	m	\$ 5,600	\$ 6,614,000
Microtunnel Premium (curved)	1181	m	\$ 1,000	\$ 1,181,000
Microtunnel Premium (dia. driven by length)	1181	m	\$ 4,100	\$ 4,842,100
Connections Upstream	9	vm	\$ 20,000	\$ 180,000
Downstream	30.5	vm	\$ 20,000	\$ 610,000
Intermediate 1	0	vm	\$ 20,000	\$ -
Intermediate 2	0	vm	\$ 20,000	\$ -
Restoration 1	800	sq m	\$ 100	\$ 80,000
Restoration 2	2000	sq m	\$ 100	\$ 200,000
Restoration 3	0	sq m	\$ 100	\$ -
Mob/demob	1		10%	\$ 1,569,000
Construction Contingency	1		25%	\$ 3,921,000
Total Construction Cost				\$ 21,172,100
Engineering Upset Limit				\$ 1,525,418
Halifax Water Project Management and Administration				\$ 85,873
Grand Total				\$ 23,730,391

5.5 Option 3B Straight

Option 3B has ratings less than or equal to 2 (two) in some evaluation categories as shown in Table 16. This alignment has lower ratings in the evaluation categories of stakeholder acceptability, property and environmental. As discussed in Section 4, this alignment option produces high stakeholder impact as the alignment directly intersects various properties, travelling beneath numerous existing infrastructure and proposed infrastructure and travels in close proximity to a concrete retaining wall.

A summary of option 3B evaluation scoring is provided in Table 16 below.

Table 16 Option 3B Evaluation Table

Evaluation Criteria	Criticality Weighting	Option 3B Straight
		Score
Constructability	5	5
Property	3	2
Risk Mitigation	4	3
Ground Conditions	3	4
Cost	5	3
Environmental	5	1
Schedule	3	3

A breakdown of the cost model for option 3B is provided in Table 17 below.

Table 17 Option 3B Cost Model

Option	3B			
CONSTRUCTION				
Item	Quantity	Unit	Unit Cost	Total Cost
Property Allowance				\$ 1,277,000
Shaft 1	9	vm	\$ 50,000	\$ 450,000
Shaft 2	30.5	vm	\$ 50,000	\$ 1,525,000
Shaft 3	17	vm	\$ 50,000	\$ 850,000
Microtunnel	1084	m	\$ 5,600	\$ 6,071,000
Microtunnel Premium (curved)	0	m	\$ 1,000	\$ -
Microtunnel Premium (dia. driven by length)	0	m	\$ 4,100	\$ -
Connections Upstream	9	vm	\$ 20,000	\$ 180,000
Downstream	30.5	vm	\$ 20,000	\$ 610,000
Intermediate 1	0	vm	\$ 20,000	\$ -
Intermediate 2	0	vm	\$ 20,000	\$ -
Restoration 1	800	sq m	\$ 100	\$ 80,000
Restoration 2	2000	sq m	\$ 100	\$ 200,000
Restoration 3	800	sq m	\$ 100	\$ 80,000
Mob/demob	1		10%	\$ 1,005,000
Construction Contingency	1		25%	\$ 2,512,000
Total Construction Cost				\$ 13,563,000
Engineering Upset Limit				\$ 1,525,418
Halifax Water Project Management and Administration				\$ 85,873
Grand Total				\$ 16,451,291

5.6 Summary of Options

A summary of the evaluation results for all options are found in Table 18 below.

Table 18 Summary of Options Evaluation Table

Evaluation Criteria	Criticality Weighting	1 Curved	2a Curved	2b Straight	3a Curved	3b Straight
		Score	Score	Score	Score	Score
Constructability	5	2	4	5	3	5
Property	3	1	3	1	4	2
Risk Mitigation	4	2	3	4	2	3
Ground Conditions	3	4	3	3	4	4
Cost	5	3	4	4	1	3
Environmental	5	2	1	1	2	1
Schedule	3	3	4	3	2	3

Table 19 below provides a visual summary of Table 18 and includes preference marker based on the following legend.












































	Least preferred
	Preferred
	Most Preferred

Table 19 Visual Summary of Options Evaluation Table

Evaluation Criteria	Criticality Weighting	1 Curved	2a Curved	2b Straight	3a Curved	3b Straight
		Score	Score	Score	Score	Score
Constructability	5					
Property	3					
Risk Mitigation	4					
Ground Conditions	3					
Cost	5					
Environmental	5					
Schedule	3					
	Total	 67	 87	 87	 68	 84

A summary of the total cost results for all options are found in Table 20 below.

Table 20 Summary of Options Cost Table

Option	1	2A	2B	3A	3B
Total Cost	\$ 13,448,291	\$ 12,587,291	\$ 12,600,291	\$ 23,730,391	\$ 16,451,291

6 RECOMMENDATIONS AND NEXT STEPS

It is recommended by the technical team that Halifax Water proceed with option 2A **subject to stakeholder acceptability** as it provides reasonable constructability if completed by an experienced curved microtunnel contractor, provides mitigated property impact, allows for risk mitigation with regards to microtunnel drive length and radius of curvature, has the least cost among all options, and has the least schedule impact of all options.

Next steps for the Fairview Cove Trunk Sewer project include a presentation by the technical team to present all options along with the preferred alignment to Halifax Water and proceed to preliminary design with an agreed alignment subject to successful negotiation of property impacts with affect property owners.

7 DOCUMENT CONTROL

Version History

Version	Date Created	Author	Date Reviewed	Reviewer	Comment
0.01	190515	YH	190727	NL	Draft for internal review.
0.02	190527	NL			WIP
1.0	190528	NL	190528	TB	TOC circulated to project team.
2.0	190711	NL	190711	TB	Draft version circulated to project team.
3.0	190712	NL	190712	AB, JC	Circulated to Halifax Water.
3.01	190712	NL	190721	PH	Revised per PH comments.
3.02	190724	NL			WIP
4.0	190909	NL	191003	TB	Final version circulated to project team.

Fairview Cove Trunk Sewer - Tunnel Construction Phase

	Actual numbers	Averaged
Total	\$14,294,500	\$14,300,000
10% Contingency	\$1,429,450	\$1,430,000
Consultant*	N/A	N/A
Subtotal	\$15,723,950	\$15,730,000
4.286% HST	\$673,928	\$675,000
Halifax Water Staff Cost**	\$90,000	\$90,000
Subtotal	\$16,487,878	\$16,495,000
1% Interest and Overhead	\$164,879	\$165,000
Total	\$16,652,757	\$16,660,000

Total for Construction Phase - Funding \$16,652,757 **\$16,660,000**

Consultant - Design and Contruction Services \$1,100,000 **\$1,100,000**

Overall Project Total \$17,752,757 **\$17,760,000**

Halifax Staff- assuming 20 hours per week x 60 weeks x \$75 ave \$ 90,000

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: Heidi Schedler Digitally signed by Heidi Schedler
Date: 2020.11.20
11:00:15 -04'00'
Heidi Schedler, General Counsel and Corporate Secretary

APPROVED: Cathie O'Toole Digitally signed by Cathie O'Toole
Date: 2020.11.20
10:50:41 -04'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 19, 2020

SUBJECT: **Code of Conduct Policy**

ORIGIN

June 20, 2012 approval of the Conflict of Interest, Outside Employment, and Gifts Policy #8.17.

April 20, 2017 approval of Code of Conduct Policy #8.24.

March 28, 2019 approval of Halifax Water Fraud Policy #8.32.

RECOMMENDATION

It is recommended that the Halifax Water Board:

1. approve the Code of Conduct Policy, as attached,
2. rescind the Conflict of Interest, Outside Employment, and Gifts Policy #8.17 and the Code of Conduct Policy #8.24,

subject to review of the Code of Conduct Policy by the Halifax Water Labour Management Committee.

BACKGROUND

On September 5, 2006, the Board approved the Conflict of Interest, Outside Employment, and Gifts Policy #8.17, and then later amended the policy on June 20, 2012. On April 20, 2017, the Board approved the Code of Conduct Policy #8.24. These policies remain in place.

DISCUSSION

In the Fall of 2018 the Halifax Water Board asked for an analysis of how Halifax Water's financial management, governance and control environment compared to the IWK Health Centre, in the context of the December 2018 report from the Provincial Office of the Auditor General (OAG) "IWK Health Centre – Financial Management Controls and Governance." The analysis was conducted and a memo with recommendations was presented at a January 2019 meeting of the Halifax Water Audit and Finance Committee.

The Audit and Finance Committee directed staff to return with an Action Plan to address the recommendations. That plan was presented at an Audit and Finance Committee meeting on March 25, 2019 along with a proposed Fraud Policy and some other related policy changes.

In March 2019 (Item#7) it was recommended the Board approve a Fraud Policy, as well as a) approve a revision of the threshold for gifts in the Conflict of Interest Policy from \$125 to \$250 to align with Section 16 of the Conflict of Interest Act; and revise the process around annual Conflict of Interest Statements, and b) educate all staff on the Conflict of Interest Policy in conjunction with the Fraud Policy, and implement a process to ensure annual policy reminders occur.

The Board approved the Fraud Policy but directed that some further analysis around changes to the Code of Conduct. This work was delayed due some retirements in key positions and has now been completed by the new General Manager and new General Counsel and Corporate Secretary.

At issue was simply changing the dollar value threshold within the Conflict of Interest Policy, without doing a complete review of the policy.

In 2019, Halifax Water reviewed and updated the employee Code of Conduct and associated policies, for the purpose of ensuring the policy remains relevant and effective. In particular, Halifax Water wants to bring the policies in line with the \$250 gift threshold found in the *Conflict of Interest Act*, S.N.S., 2010, c. 35. of.

Subject to Board approval of the attached policy, Halifax Water will follow standard procedures for internal review of updated policies, which includes review by the Labour Management Committee and Halifax Water executive. If any substantial changes are recommended during the internal review process, Halifax Water will return to the Board with an update and request for approval of amendments.

BUDGET IMPLICATIONS

None

ALTERNATIVES

None recommended

ATTACHMENT

Code of Conduct Polic

Report Prepared by:

**Heidi
Schedler**

Digitally signed by Heidi
Schedler
Date: 2020.11.20
11:00:34 -04'00'

Heidi Schedler, General Counsel and Corporate Secretar

Purpose

The purpose of this policy is to assist employees with understanding acceptable conduct and consequences of misconduct and to protect the reputation and integrity of Halifax Water.

Definitions

“Conflict of interest” means when an employee is placed in a situation where their personal or financial interest, or that of a family member or a close, personal contact, conflicts with the interests of Halifax Water or with the employee’s responsibility to Halifax Water. A conflict of interest can be actual or perceived and depends on the situation, not on the character or actions of the employee.

“Employee” means any Halifax Water employee and does not include independent contractors

Scope

This policy applies to all Halifax Water employees.

This policy sets Halifax Water’s expectations for employee conduct. This policy represents the minimum standards for employee conduct and provides guidance to employees on what is appropriate conduct.

Supervisors and Managers are expected to be role models of acceptable conduct, and to encourage and promote compliance with this policy.

Employee Responsibilities

Employees must comply with this policy.

Upon beginning employment with Halifax Water all employees must acknowledge in writing, that they have read, understand and will comply with this policy, and disclose any and all actual or perceived conflicts of interest in accordance with this policy, using the attached Employee Acknowledgement and Disclosure form.

Halifax Water Responsibilities

Halifax Water must provide this policy to all employees upon beginning employment with Halifax Water and must make this policy available to all employees on an ongoing basis via the Halifax Water intranet or other such means as deemed appropriate by Halifax Water.

Halifax Water will update employees at least annually on this policy, including any training or education to help employees understand and comply with this policy.

Standard of Conduct

Honesty and Integrity

Employees are expected to act honestly and with integrity at all times. This includes upholding and respecting the law and not knowingly engaging in illegal activities.

Any employee charged with or found guilty of a criminal offence must immediately notify their supervisor/manager, who must in turn notify the Human Resources Manager.

Loyalty

Employees owe primary business loyalty to Halifax Water. Employees must disclose to and seek the consent of Halifax Water for any and all outside business interests and/or enterprise.

Conflict of Interest

Employees are expected to avoid conflicts of interest. The standard that will be applied to determine whether a conflict of interest exists is that of an independent observer who might reasonably question whether the employee's actions or decisions are influenced by or could result in a gain or benefit to the employee, family member or close, personal contact.

A conflict of interest will arise in the following situations:

- When the employee has a financial interest, beyond their employment income and benefits, in the outcome of a decision of Halifax Water.
- When the employee is related to, in a close personal relationship, or in a financial relationship with a supplier or contractor conducting business with Halifax Water.
- When the employee uses information gained from their employment for personal gain.
- When the employee's duties include regulatory, inspection, or other discretionary decision-making and the decision relates to a family member and/or close, personal contact.
- When the employee accepts monetary or other payment from an external source for duties performed in the course of their employment.

Employees must not apply for membership on the Halifax Water Board of Commissioners.

Any other situation that could lead to a conflict of interest must be disclosed by the employee, in accordance with this policy, and discussed with their manager/supervisor.

Accepting Gifts or Payments

Employees are not permitted to accept a gift, payment or service in connection with their employment or employment duties that exceeds \$250 in value. An employee who is unsure of the value of the gift and/or whether to accept it should disclose the gift to their manager/supervisor and seek direction.

Representing Halifax Water and Speaking Publicly

Employees are expected to represent Halifax Water in accordance with this policy.

Employees must not speak publicly on behalf of Halifax Water unless authorized to do so by the General Manager. Employees must seek approval from their manager/supervisor to speak in a professional capacity at an event such as a conference.

Employees are expected to use the Halifax Water brand only as part of their regular duties, or as approved by their manager/supervisor.

Employees must not disparage, defame, embarrass or harass customers, employees or Halifax Water when speaking publicly, whether in a professional or personal capacity. This includes any comments made via social media.

Confidentiality and Privacy and Information Security

Employees are expected to maintain the confidentiality and privacy of all Halifax Water information. Employees must access and use Halifax Water information only for the intended purpose and share it only with those who need to know.

Employees will use Halifax Water systems and resources only for the purpose of fulfilling their job duties. Employees must not use Halifax Water systems or resources to access, download or distribute information that may be considered offensive, illegal, unethical, discriminatory or harmful to Halifax Water in any way.

Employees agree that, at any time during or after their employment, Halifax Water may require them to return any and all Halifax Water information, devices, supplies, equipment, uniforms or property of any kind.

Political or Religious Activity

Employees are not permitted to carry on political and/or religious activities or advocacy at Halifax Water facilities or while officially representing Halifax Water. This includes seeking contributions, campaigning, and/or promoting political or religious causes, beliefs or practices.

Duty to Disclose

Employees must report to their manager/supervisor any incidences or suspicions of conduct contrary to this policy. Employees must work collaboratively with Halifax Water to resolve and/or manage any actual or potential breaches of this policy.

Employees must make written, full, timely and ongoing disclosure to Halifax Water of conflicts of interest. The attached Employee Acknowledgement and Disclosure form must be completed by every employee upon beginning employment with Halifax Water. Thereafter, ongoing, written disclosure must be made by employees as conflicts of interest arise. Failure to disclose a conflict of interest may result in disciplinary action being taken, up to and including termination of employment.

Violations

Any violation of this policy by an employee may result in discipline up to and including termination for cause. Depending on the severity of the violation, an employee who violates this policy could also be subject to civil or criminal liability.

Any employee who engages in retaliation against an employee who has or is believed to have reported potential or real violations of this policy or assisted with any investigation of a violation of this policy will be subject to discipline up to and including termination.

Related Policies

Civility and Respect in the Workplace Policy #4.04

Public Relations Policy #8.08

Fraud Policy #8.32

Employee Acknowledgement and Disclosure Form (Policy #_____)

I _____, have read and understand the Code of
Conduct Policy #_____.

Please check the applicable box:

☐ I do not have any information to disclose in relation to the Code of Conduct Policy #_____,
including conflicts of interest.

☐ I have information to disclose in relation to the Code of Conduct Policy #_____.

Description and details:

**I confirm that the above is a true statement and provides a complete disclosure as required
under the Halifax Water Code of Conduct Policy #_____.**

Signature: _____ Date: _____

Print name: _____

Item 7 is a verbal report.

**2021/22 Board & Sub-Committee
Meeting Dates****Board Meeting Dates**

Date	Topic/Discussion
2021 - May 6	Governance/Strategic Planning
2021 - June 17	Board Meeting
2021 - July 15	Annual General Meeting
2021 – September 23	Board Meeting
2021 – November 25	Board Meeting
2021 – December 9	Governance/Strategic Planning
2022 – January 27	Board Meeting
2022 – March 24	Board Meeting

Committee Meeting Dates

Enterprise Risk Management	Environment, Health and Safety	Audit & Finance	Executive
Date	Date	Date	Date
2021 - June 2	2021 - June 3	2021 - June 3	2021 - May 27
2021 - September 1	2021 - September 2		2021 - September 2
2021 - November 9	2021 - November 10	2021 - November 10	2021 – November 4
		2022 - January 13	2022 - January 6
2022 - March 9	2022 - March 10	2022 - March 10	2022 - March 3



TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun

Digitally signed by Louis de Montbrun
Date: 2020.11.19 12:00:49 -04'00'

Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

Reid Campbell

Digitally signed by Reid Campbell
Date: 2020.11.19 11:48:06 -04'00'

Reid Campbell, P.Eng. Director, Water Services

Susheel Arora

Digitally signed by Susheel Arora
Date: 2020.11.19 14:19:12 -04'00'

Susheel Arora, M.A.Sc., P.Eng. Director, Wastewater & Stormwater Services

Kenda MacKenzie

Digitally signed by Kenda MacKenzie
Date: 2020.11.19 10:42:48 -04'00'

Kenda MacKenzie, P.Eng. Director, Regulatory Services

APPROVED:

Cathie O'Toole

Digitally signed by Cathie O'Toole
Date: 2020.11.19 14:47:26 -04'00'

Cathie O'Toole, MBA, CPA, CGA, ICD.D, General Manager

SUBJECT: Financial and Operations Information Report

INFORMATION REPORT

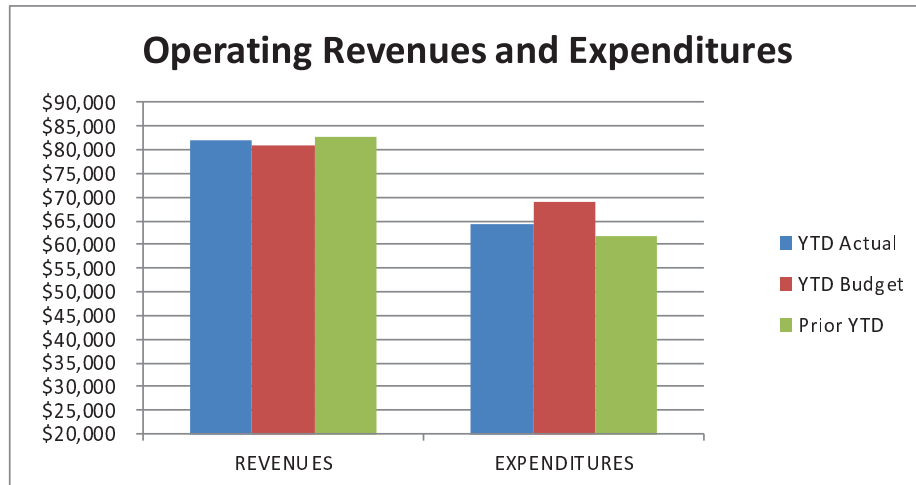
ORIGIN:

Regular update.

This report provides a high-level overview of financial and operational performance for the utility. Financial results are presented first, followed by indicators and statistics for water and wastewater.

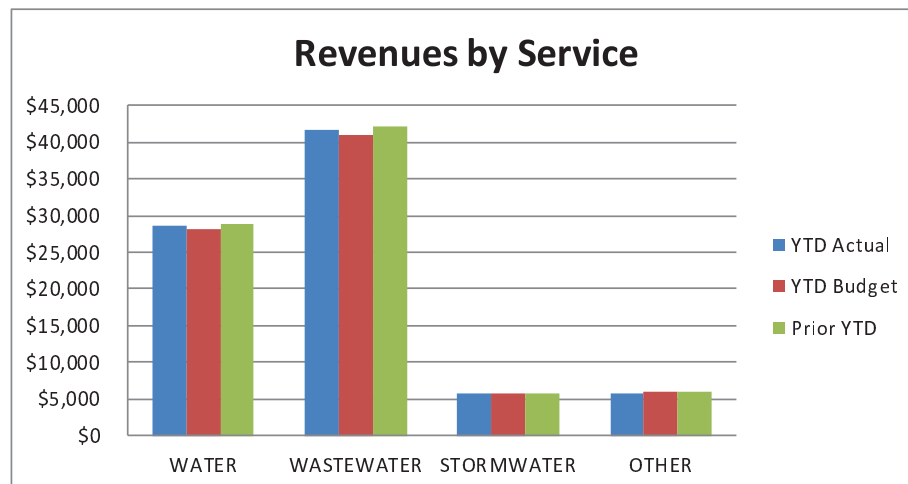
FINANCIAL

HALIFAX WATER
UNAUDITED FINANCIAL INFORMATION
APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
'000



OPERATING REVENUES AND EXPENDITURES

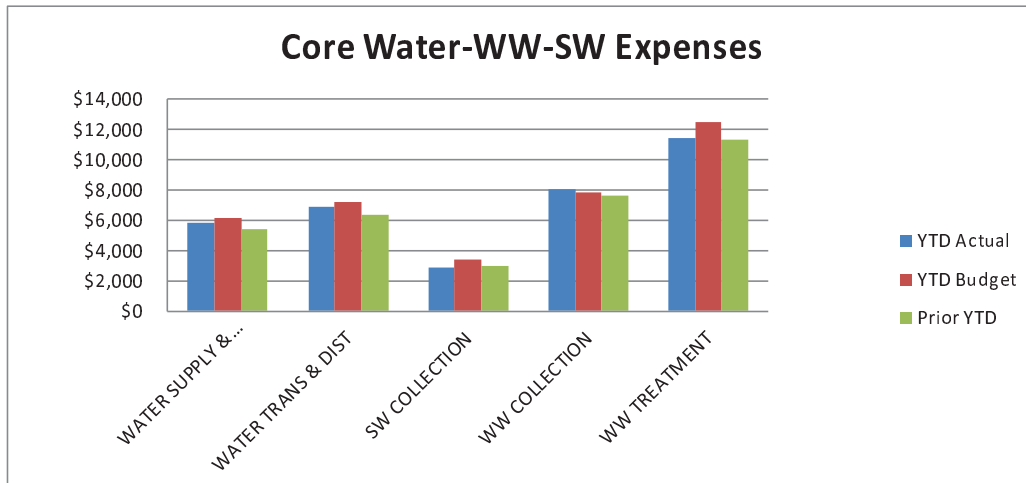
	YTD Actual	YTD Budget	Prior YTD	% of Budget
REVENUES	\$81,877	\$80,854	\$82,749	59.07%
EXPENDITURES	\$64,208	\$68,895	\$61,855	54.36%
	\$17,669	\$11,959	\$20,894	86.18%



REVENUES BY SERVICE (METERED SALES AND SITE GENERATED CHARGE)

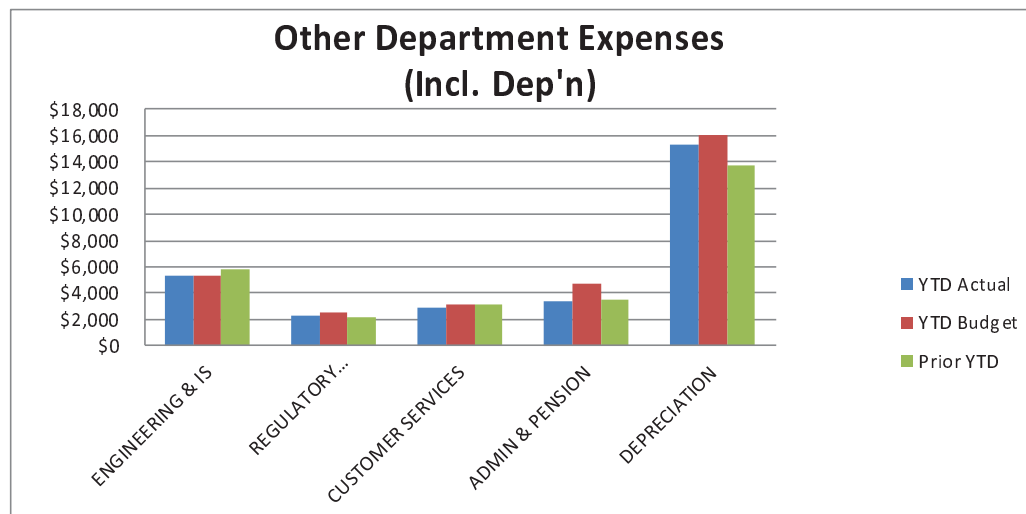
	YTD Actual	YTD Budget	Prior YTD	% of Budget
WATER	\$28,589	\$28,047	\$28,730	59.46%
WASTEWATER	\$41,682	\$41,044	\$42,111	59.24%
STORMWATER	\$5,844	\$5,764	\$5,822	59.14%
OTHER	\$5,762	\$5,999	\$6,086	56.02%
	\$81,877	\$80,854	\$82,749	59.07%

HALIFAX WATER
UNAUDITED FINANCIAL INFORMATION
APRIL 1, 2020 - OCTOBER 31, 2020 (7 MONTHS)
'000



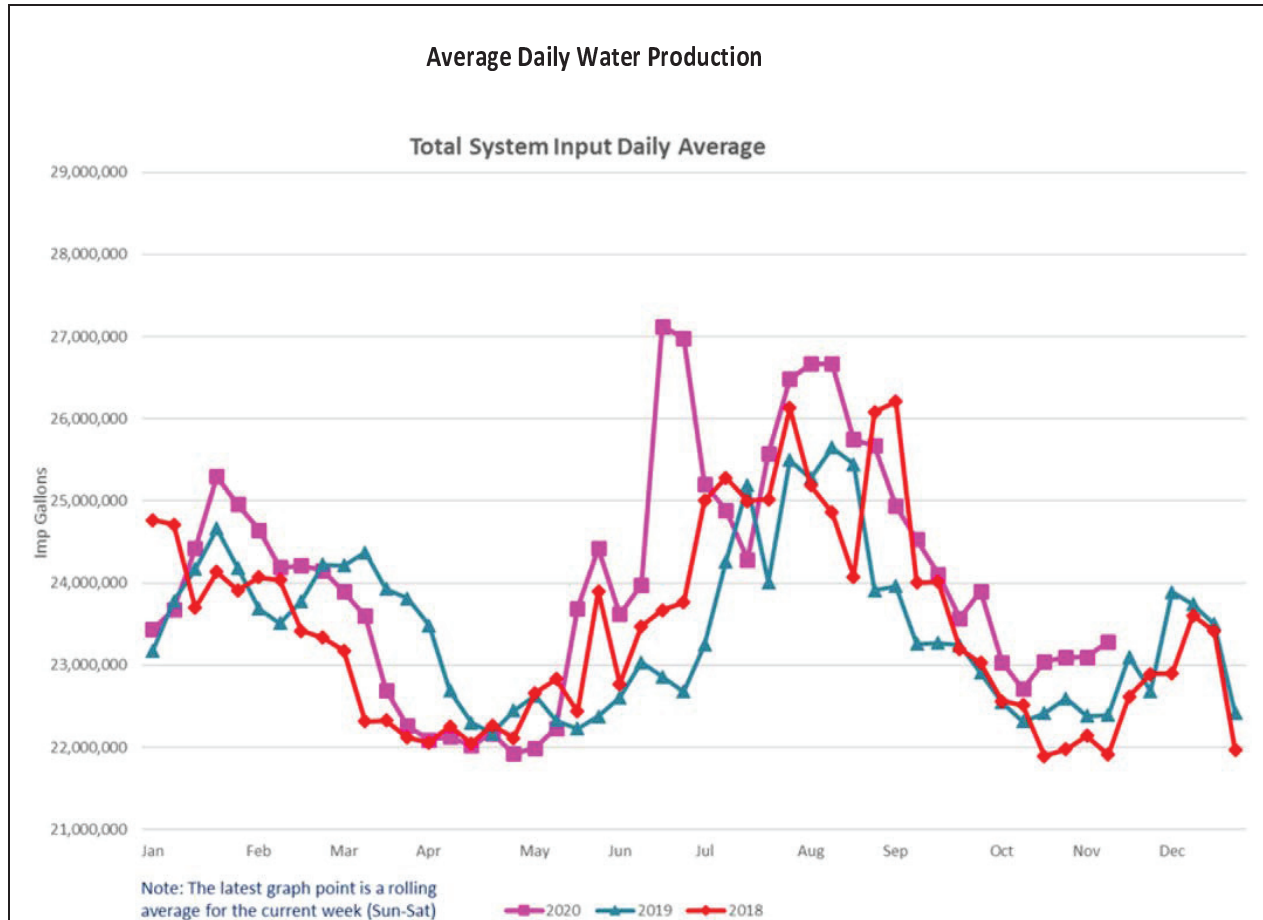
CORE WATER-WW-SW EXPENDITURES

	YTD Actual	YTD Budget	Prior YTD	% of Budget
WATER SUPPLY & TRTMNT	\$5,828	\$6,177	\$5,435	55.03%
WATER TRANS & DIST	\$6,840	\$7,181	\$6,349	55.56%
SW COLLECTION	\$2,843	\$3,395	\$2,938	48.84%
WW COLLECTION	\$8,043	\$7,874	\$7,579	59.58%
WW TREATMENT	\$11,411	\$12,490	\$11,344	53.29%
	\$34,965	\$37,117	\$33,645	54.95%



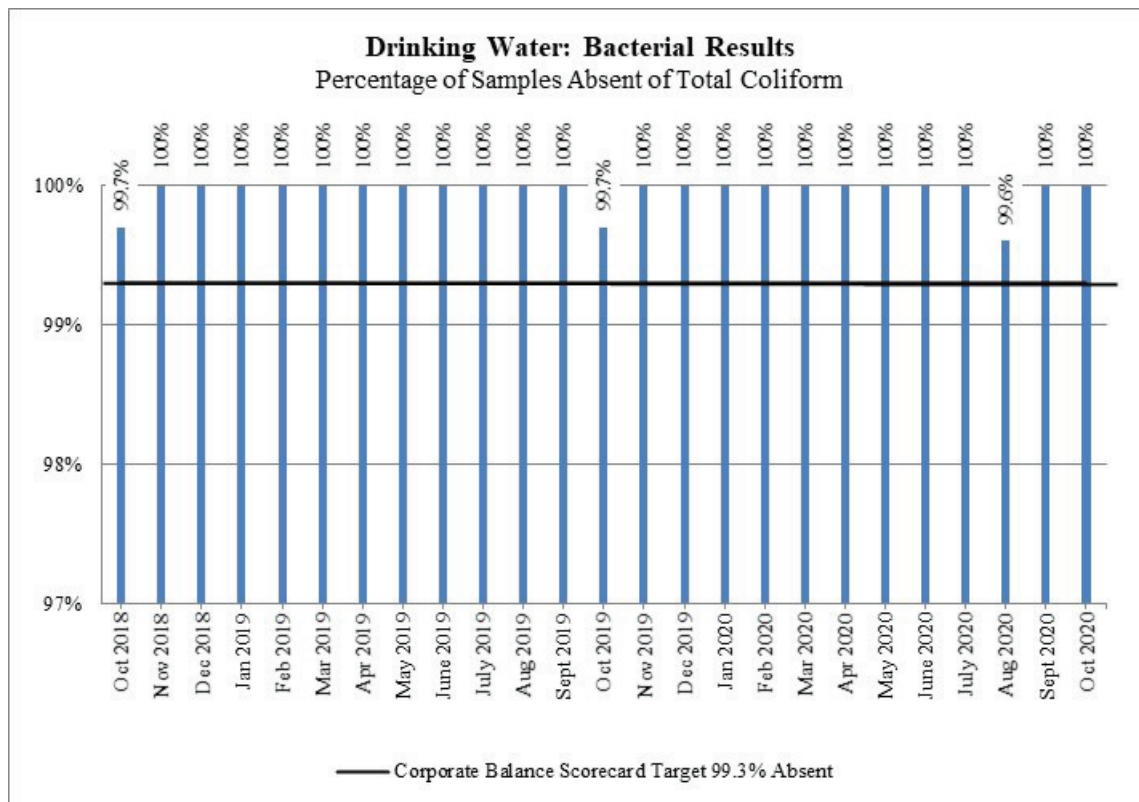
OTHER DEPARTMENT EXPENSES (INCL DEP'N)

	YTD Actual	YTD Budget	Prior YTD	% of Budget
ENGINEERING & IS	\$5,377	\$5,369	\$5,792	58.42%
REGULATORY SERVICES	\$2,340	\$2,543	\$2,165	53.68%
CUSTOMER SERVICES	\$2,854	\$3,158	\$3,086	52.72%
ADMIN & PENSION	\$3,330	\$4,708	\$3,472	41.26%
DEPRECIATION	\$15,342	\$16,000	\$13,695	55.93%
	\$29,243	\$31,778	\$28,210	53.68%



Regional Water Main Break/Leak Data		
Year	Total Breaks/Leaks	Current 12 Month Rolling Total (up to October 31, 2020)
2019/20	191	185
2018/19	226	
2017/18	206	
2016/17	216	
2015/16	226	
Total	1071	
Yr. Avg.	214.2	

Water Accountability
Losses per Service Connection/Day (International Water Association Standard)
<i>Period Ending September, 2020</i>
Real Losses: 190 litres
CBS Target: 160



Water Quality Master Plan Objectives				
2020-2021 Q2				
Objective	Total Sites	% Sites Achieving Target	All Sites: 90th Percentile < 15 µg/L	CBSC Awarded Points
Disinfection	63	92%	---	12
Total Trihalomethanes	25	80%	---	3
Haloacetic Acids	21	100%	---	20
Particle Removal	5	96%	---	16
Corrosion Control	105	---	4.28	20
Summary Total				71

In this report each facility is assessed using monthly or quarterly averages, depending on the averaging period specified in its Approval to Operate.

Wastewater Treatment Facility	Wastewater Treatment Facility Compliance Summary																	Toxicity	Trend
	Rolling Averages - August, September and October 2020																		
	CBOD ₅ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		Ammonia (mg/L)		Phosphorous (mg/L)		TRC (mg/L)		Dissolved Oxygen (mg/L)				
NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.	NSE Limit	Avg.				
Halifax	50	48	40	23	5000	6,918	6-9	6.8	-	-	-	-	-	-	-	Not acutely lethal	Continued		
Dartmouth	50	68	40	45	5000	1,464	6-9	6.7	-	-	-	-	-	-	-	Not acutely lethal	Declined		
Herring Cove	50	43	40	19	5000	46	6-9	6.8	-	-	-	-	-	-	-	Not acutely lethal	Continued		
Eastern Passage	25	11	25	8	200	42	6-9	7.1	-	-	-	-	-	-	-	Not acutely lethal	Continued		
Mill Cove	25	30	25	25	200	95	6-9	6.4	-	-	-	-	-	-	-	Not acutely lethal	Improved		
Springfield	20	53	20	337	200	136	6-9	7.1	-	-	-	-	-	-	-	-	Improved		
Frame	20	4	20	1	200	22	6-9	7.0	-	-	-	-	-	-	-	-	Continued		
Middle Musq.	20	5	20	12	200	10	6-9	7.4	-	-	-	-	-	-	-	-	Continued		
Uplands	20	5	20	10	200	22	6-9	6.6	-	-	-	-	-	-	-	-	Continued		
Aerotech	5	2	5	1	200	10	6-9	7.2	5.7 W 1.2 S	0.1	0.13	0.06	-	6.5	8.4	Not acutely lethal	Continued		
North Preston	10	5	10	3	200	10	6-9	6.8	3	0.1	1.5	0.5	-	-	-	-	Continued		
Lockview	20	6	20	11	200	14	6.5-9	6.9	8.0 S	4.3	1.2 S	0.4	-	-	-	-	Continued		
Steeves (Wellington)	20	5	20	1	200	10	6.5-9	7.2	14.4 S	0.1	1.0 S	0.1	-	-	-	-	Continued		
BLT	15	5	20	16	200	14	6-9	6.9	5 W 3 S	2	3 W 1 S	1	0.02 *	0.10	-	Not acutely lethal	Continued		
Avg. of all Facilities	21		37		629		6.9		1.2		0.4		0.10		8.4				

NOTES & ACRONYMS:

CBOD₅ - Carbonaceous 5-Day Biochemical Oxygen Demand

TSS - Total Suspended Solids

* TRC - Total Residual Chlorine - Maxxam can only measure 0.10 mg/L residual; results of 0.1 mg/L are compliant

BDL - Below Detection Limit

W / S - Winter / Summer compliance limits

NSE requires monthly averages be less than the NSE Compliance Limit for each parameter (Dartmouth, Eastern Passage, Halifax, Herring Cove, Mill Cove)

NSE requires quarterly averages be less than the NSE Compliance Limit for each parameter (Aerotech, Lockview, Mid. Musq., Frame, BLT, Uplands, North Preston, Steeves, Springfield)

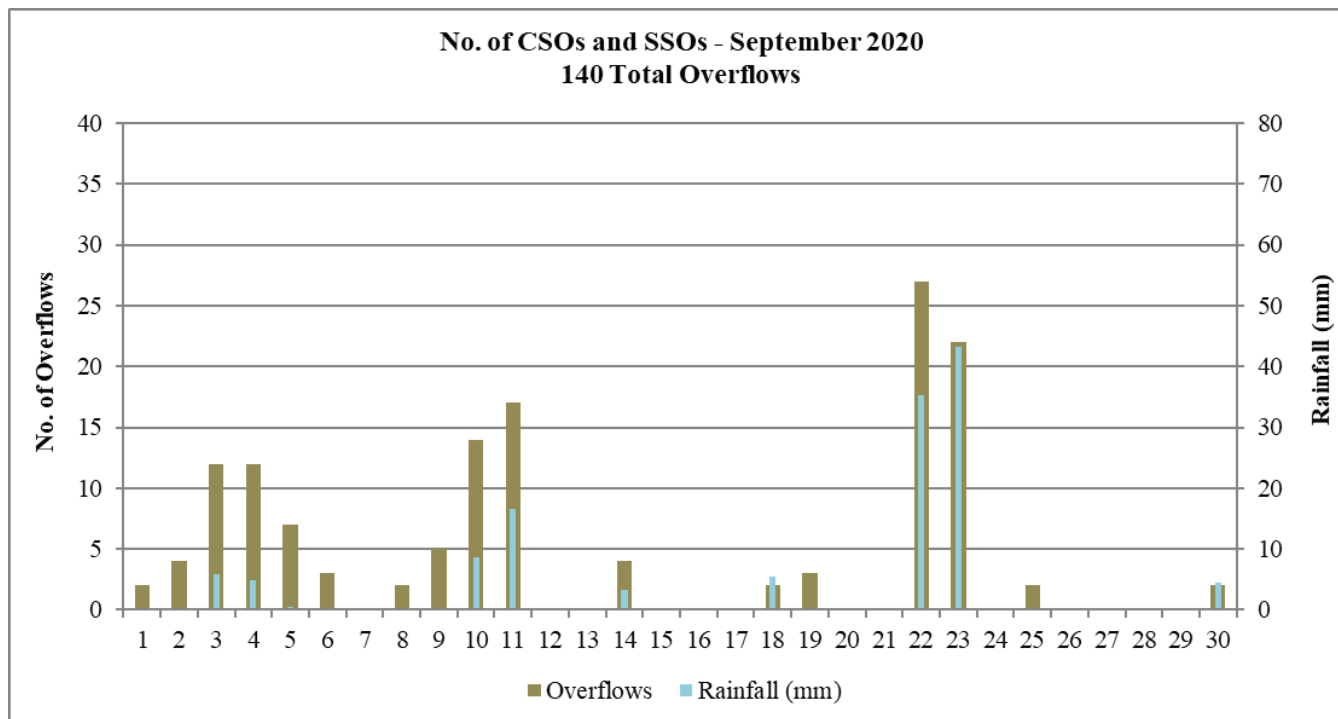
Continued - All parameters remain essentially unchanged since the last report

Improved - One or more parameter(s) became compliant since the last report

Declined - One or more parameters(s) became non-compliant since the last report

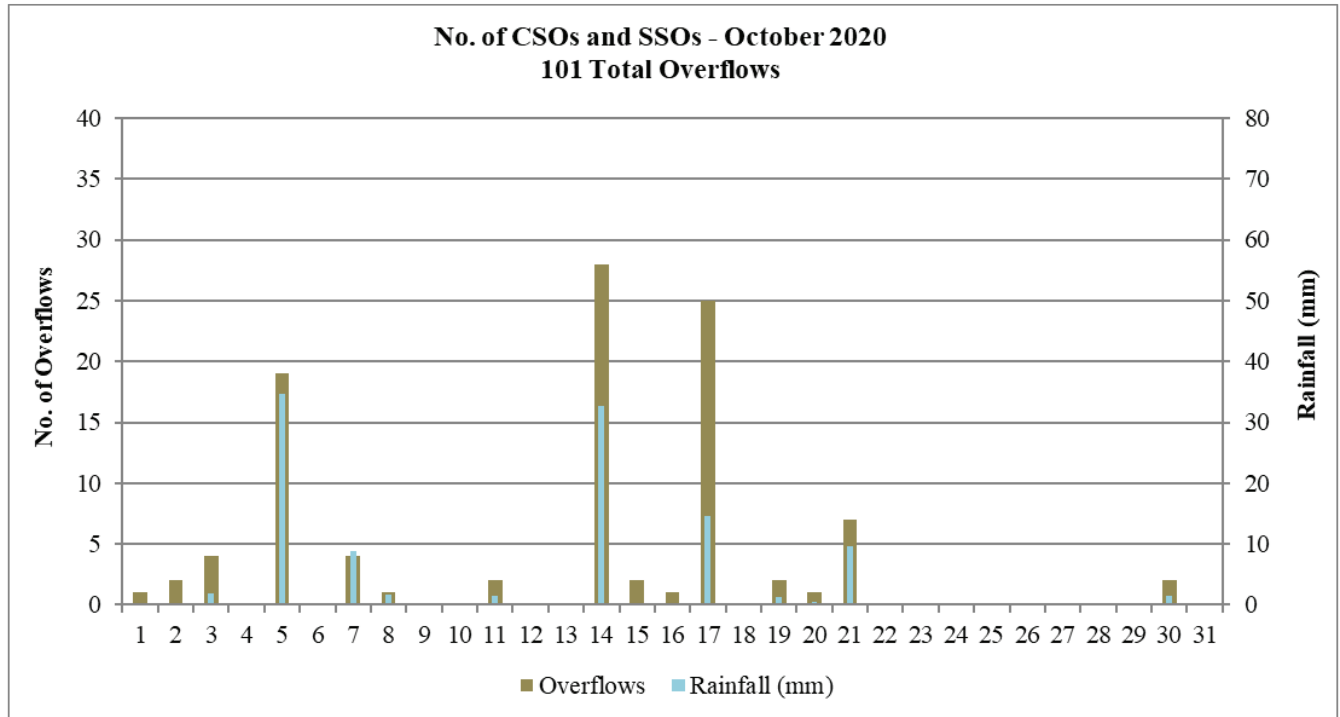
LEGEND

	NSE Compliant
	NSE Non-Compliant



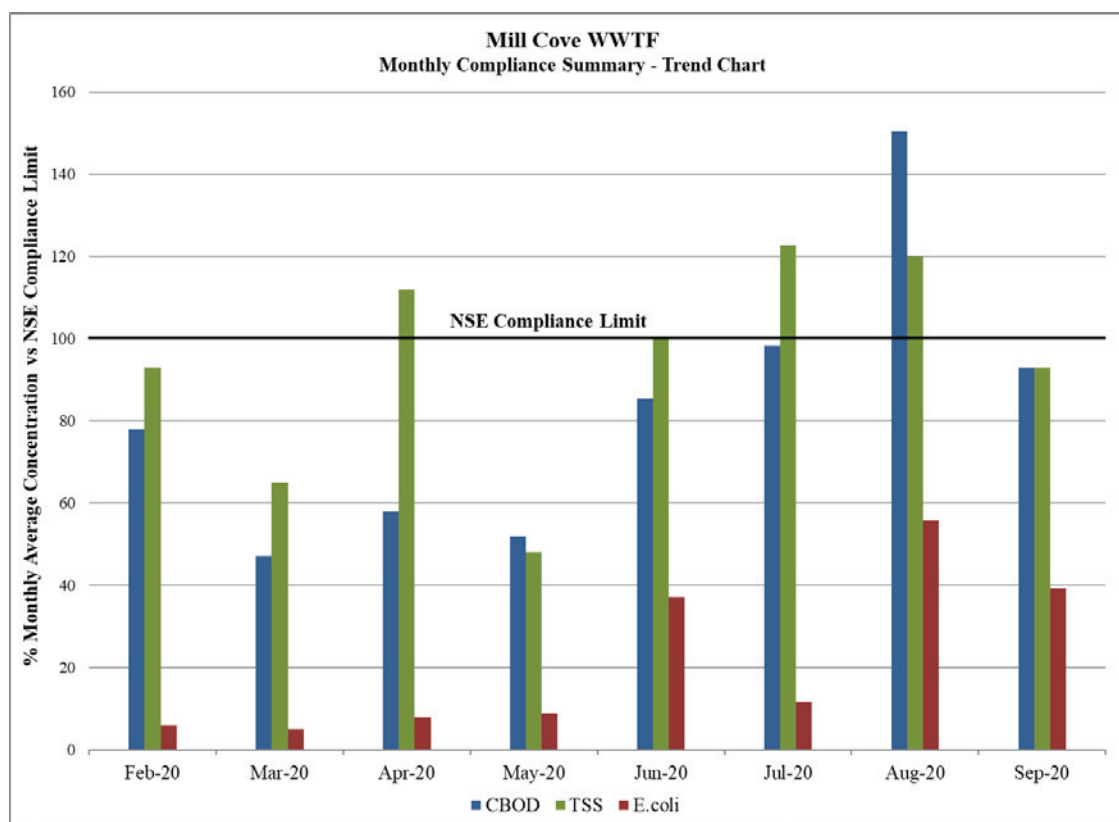
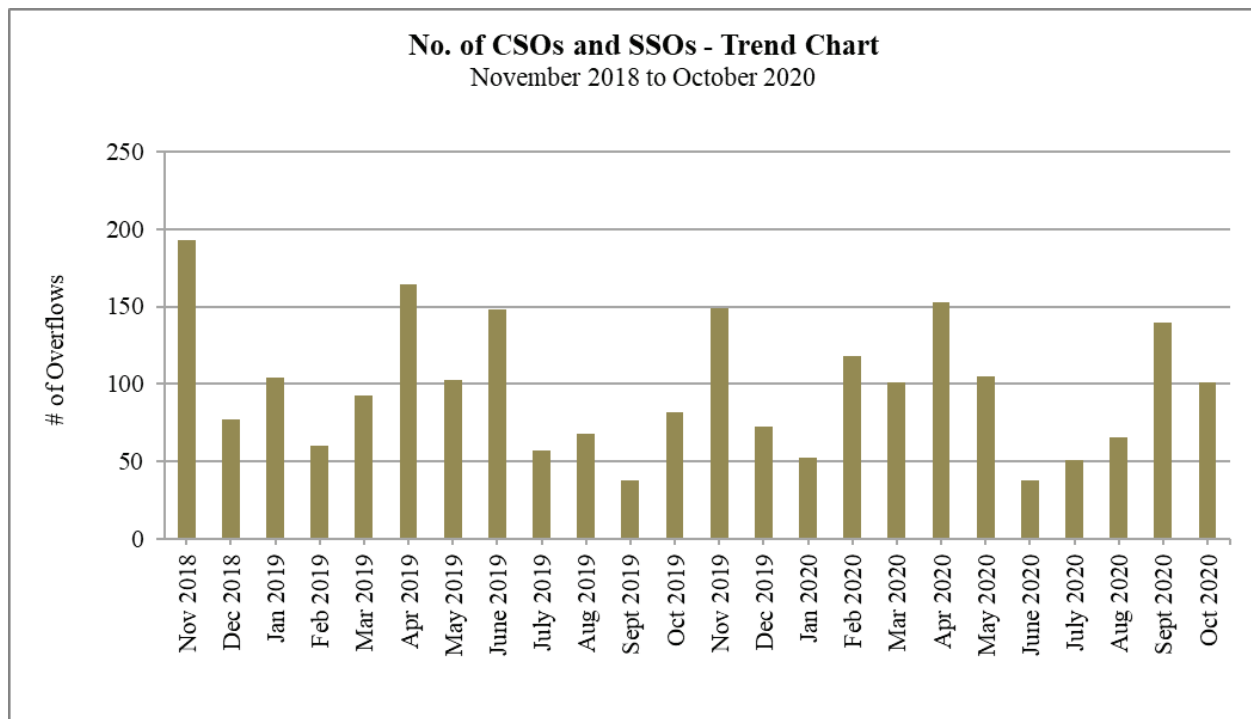
NOTES & ACRONYMS: CSO - Combined Sewer Overflow SSO - Sanitary Sewer Overflow

- Rainfall data is from Halifax Water's rain gauge at the Halifax WWTF.
- There were fourteen overflows on days when there was no recorded rainfall, as follows:
 1. September 1: The CSOs at Sackville St CSO were due to blockages caused by debris.
 2. September 2: The CSOs at Sackville St CSO were due to blockages caused by debris.
 3. September 6: The CSOs at Sackville St CSO were due to blockages caused by debris. The CSO at Upper Water St CSO was due to a power failure.
 4. September 19: The CSOs at Sackville St CSO were due to blockages caused by debris.
 5. September 25: The CSOs at Duffus St PS were due to rain on previous days.

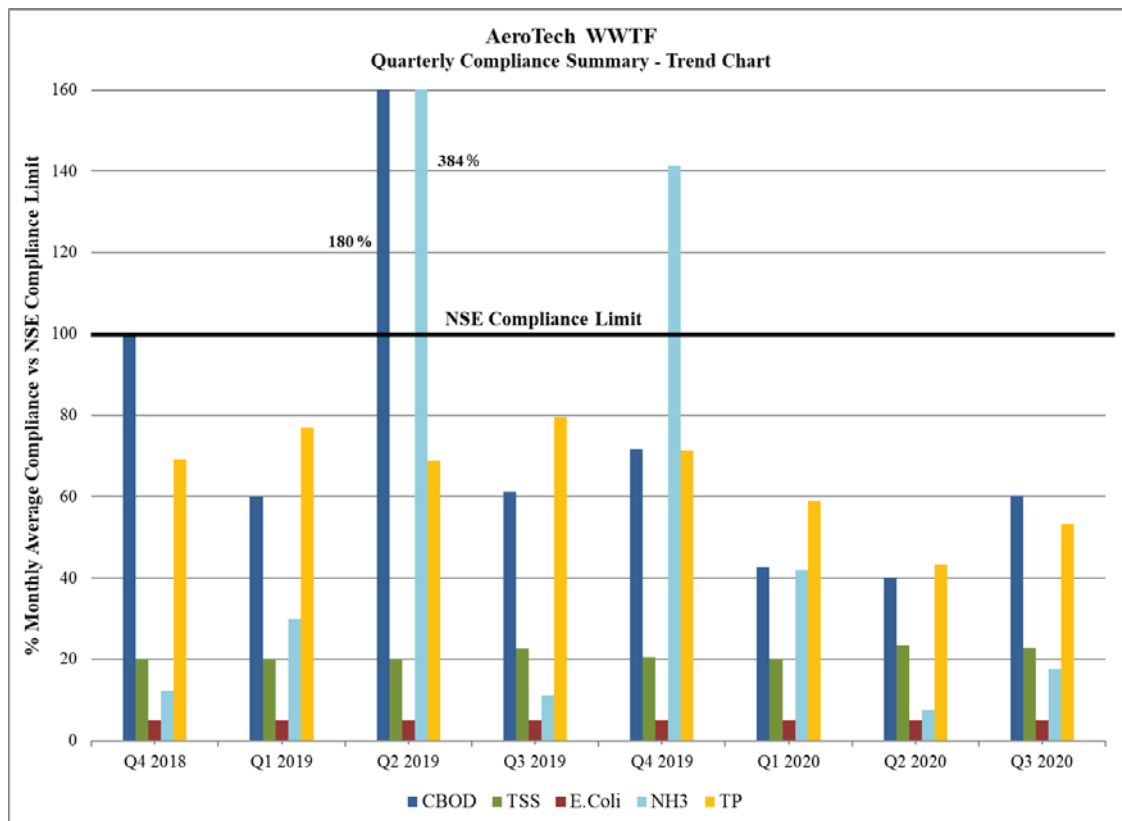


NOTES & ACRONYMS: CSO - Combined Sewer Overflow SSO - Sanitary Sewer Overflow

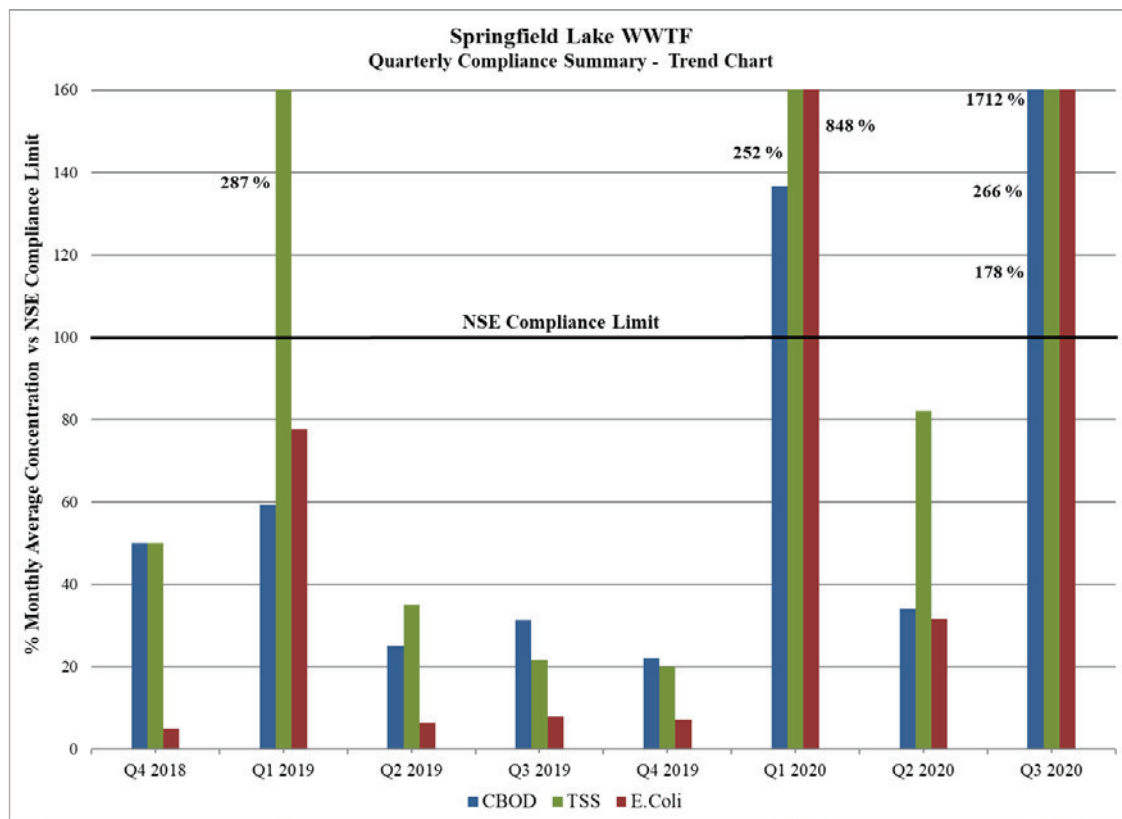
- Rainfall data is from Halifax Water's rain gauge at the Halifax WWTF.
- There were three overflows on days when there was no recorded rainfall, as follows:
 1. October 1: The CSO at Melva St PS & CSO was due a default station shutdown caused by a radio communication issue.
 2. October 15: The CSOs at Ferguson Rd CSO and Wallace St CSO were due to rain on the previous day.



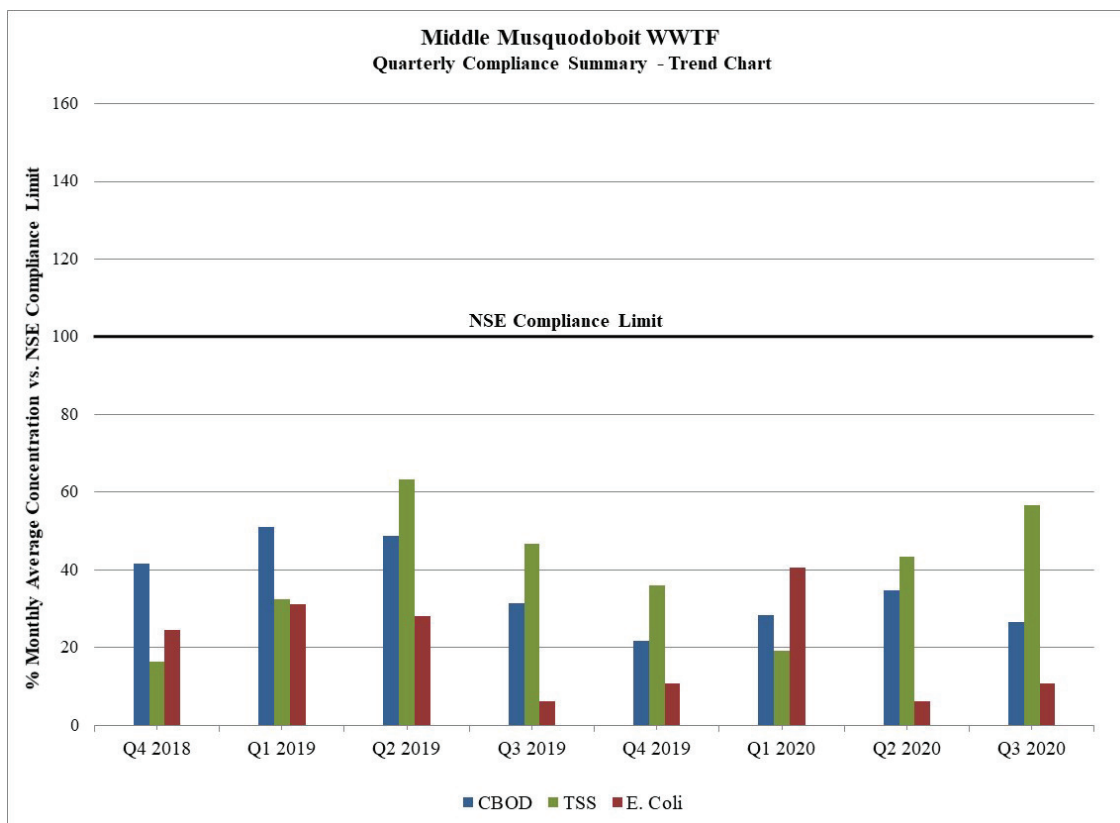
Lower numbers represent better performance.



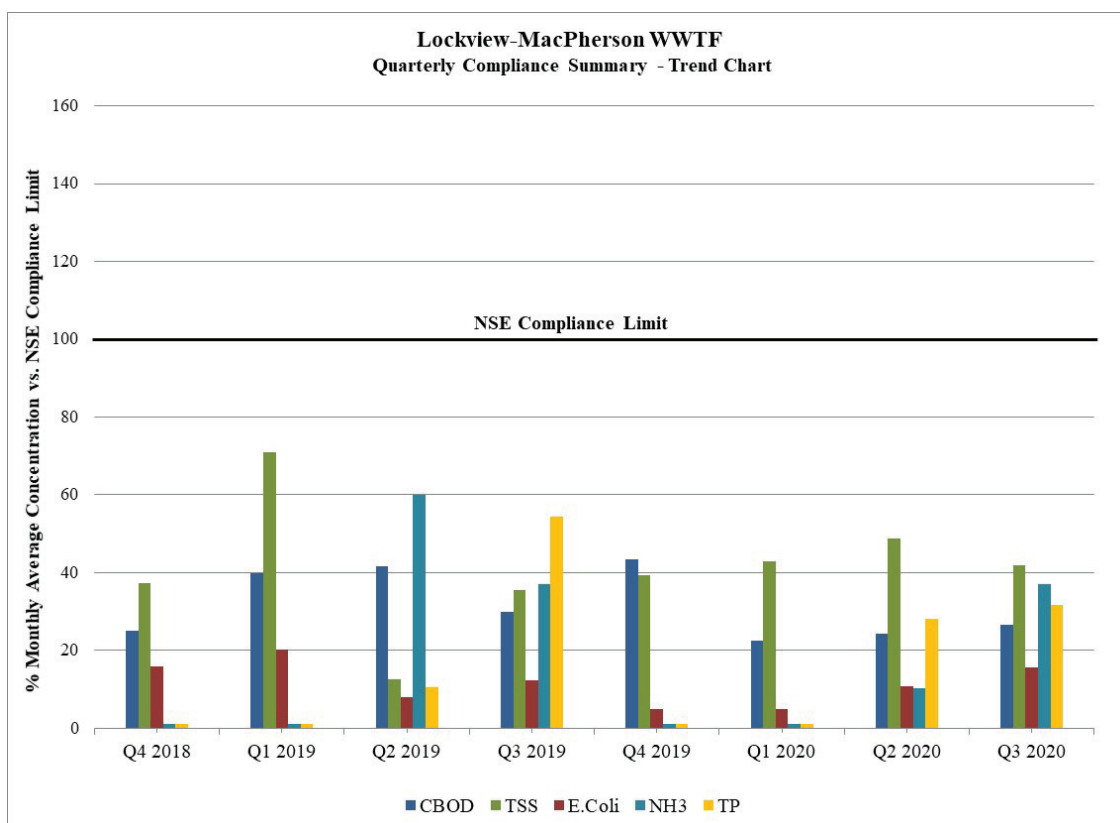
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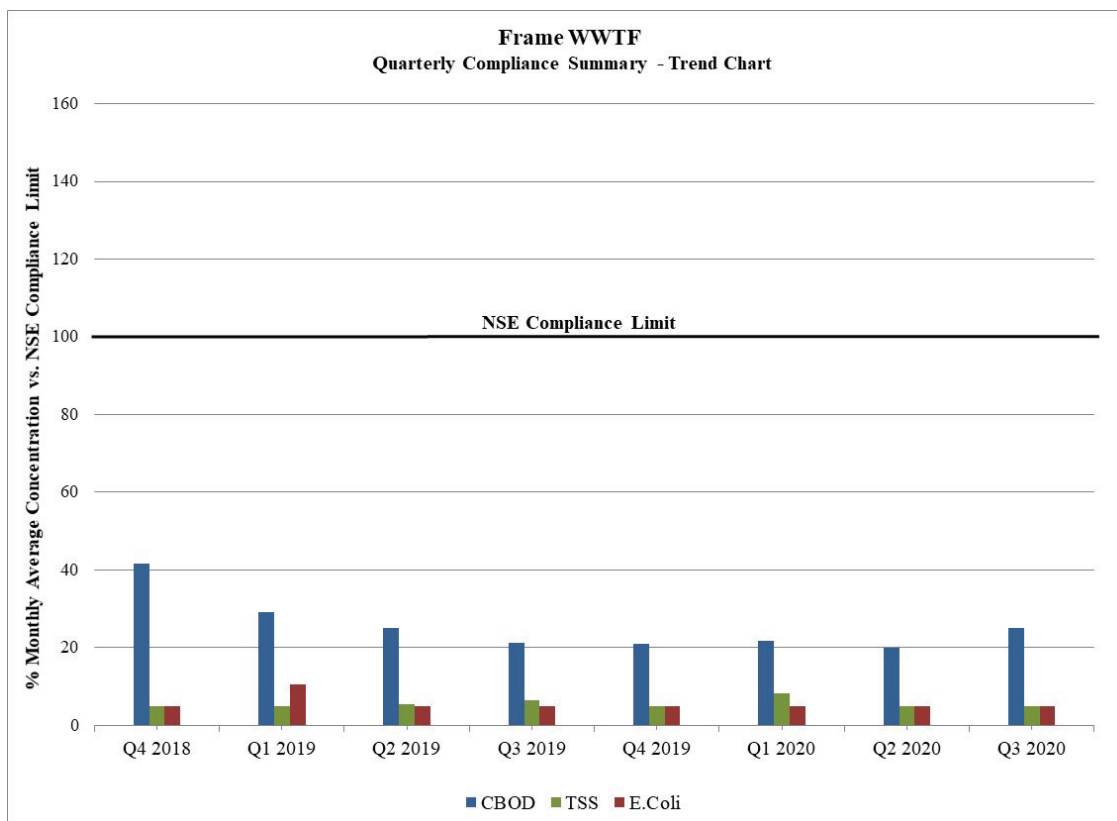
Lower numbers represent better performance.



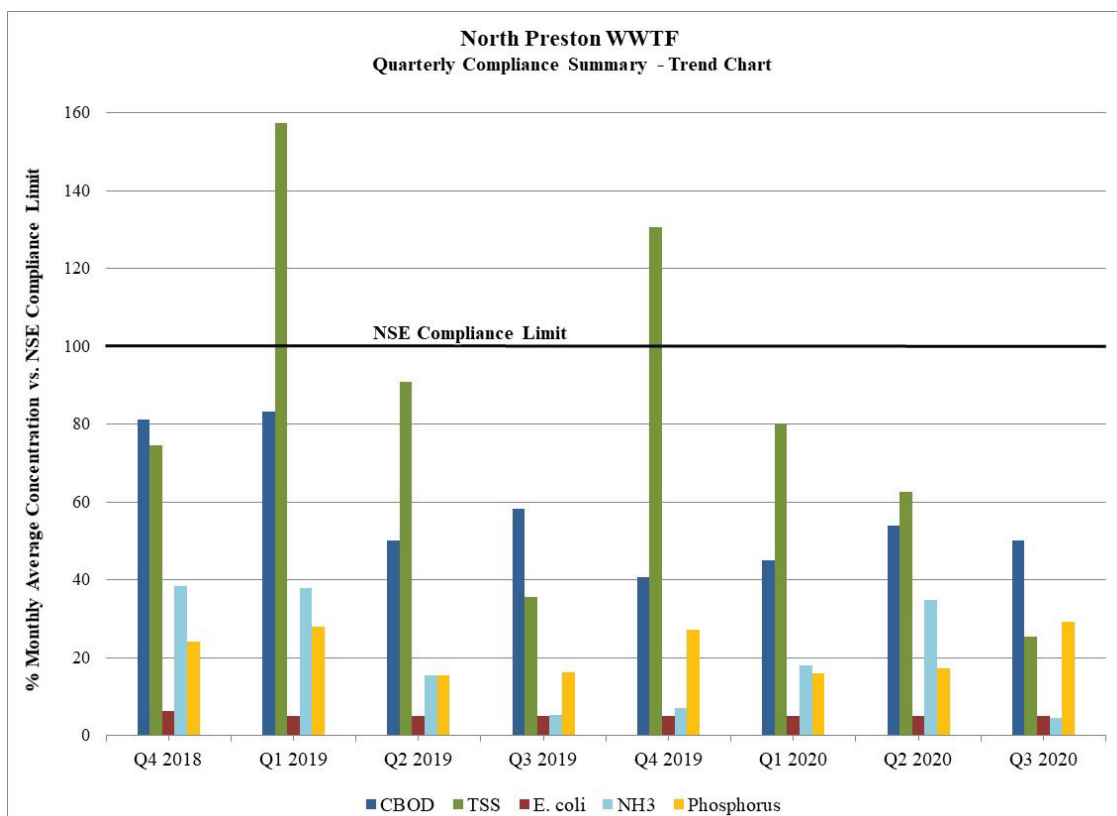
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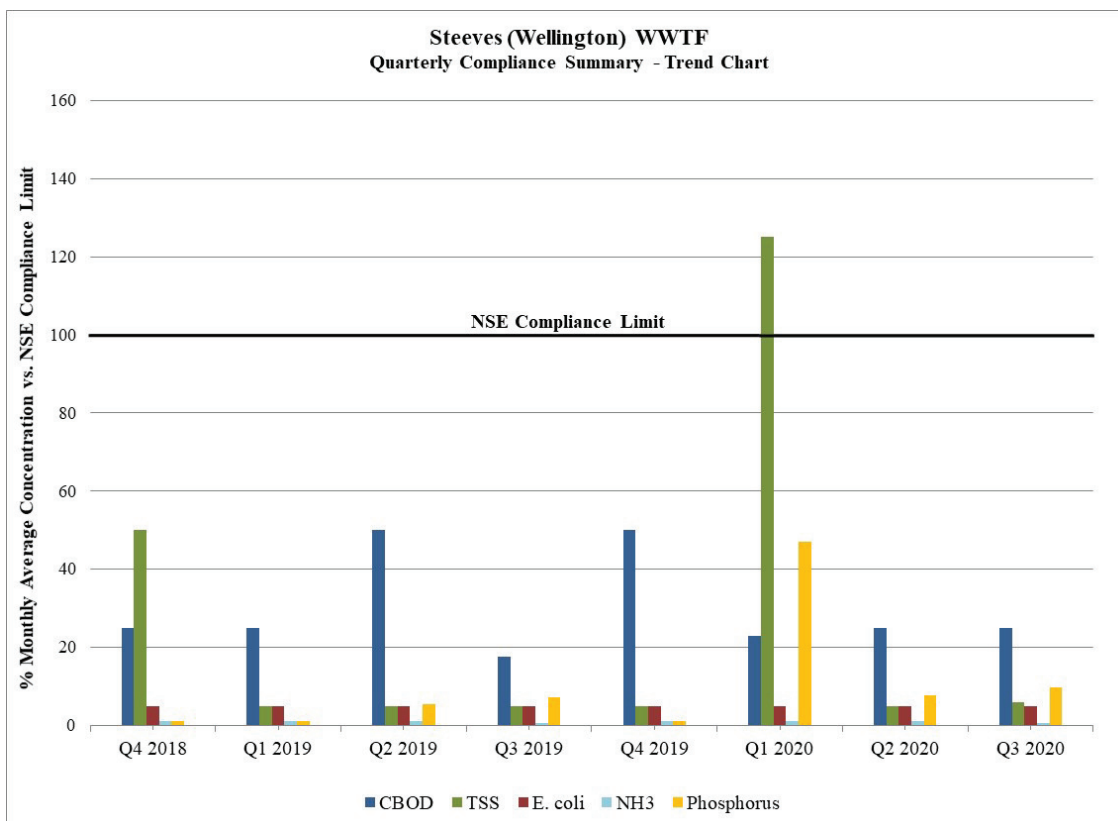
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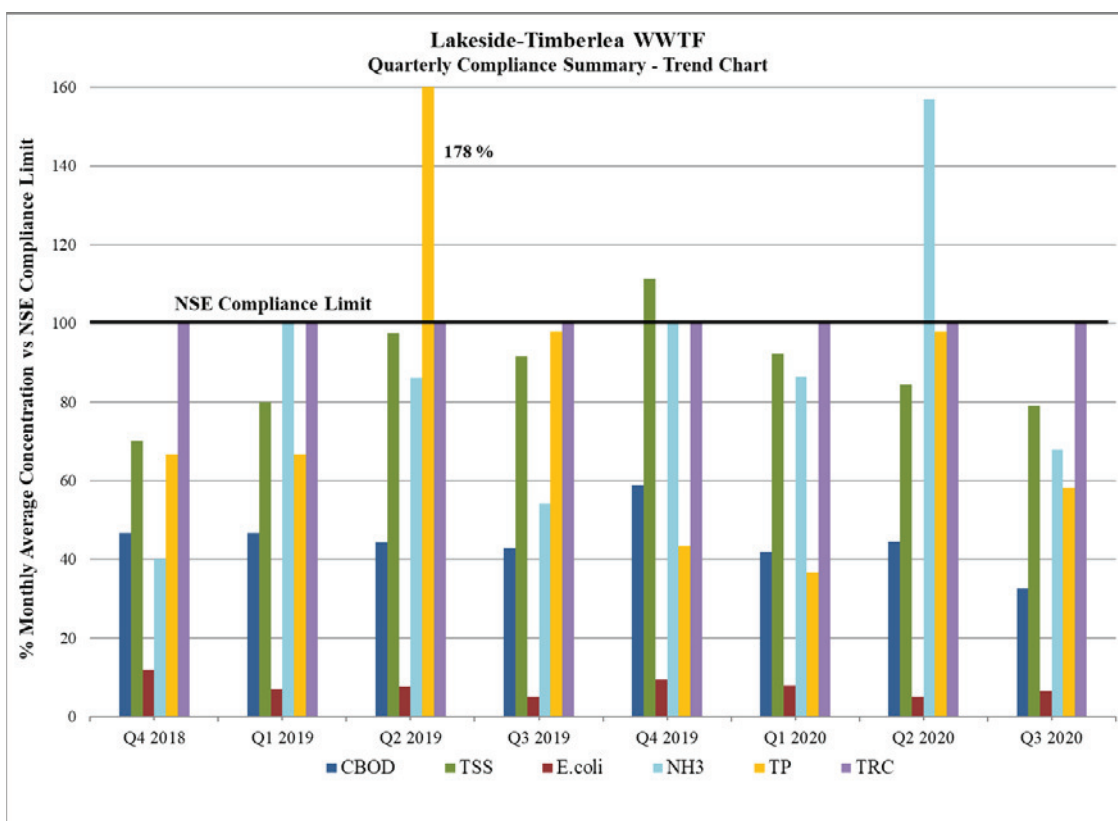
Lower numbers represent better performance.



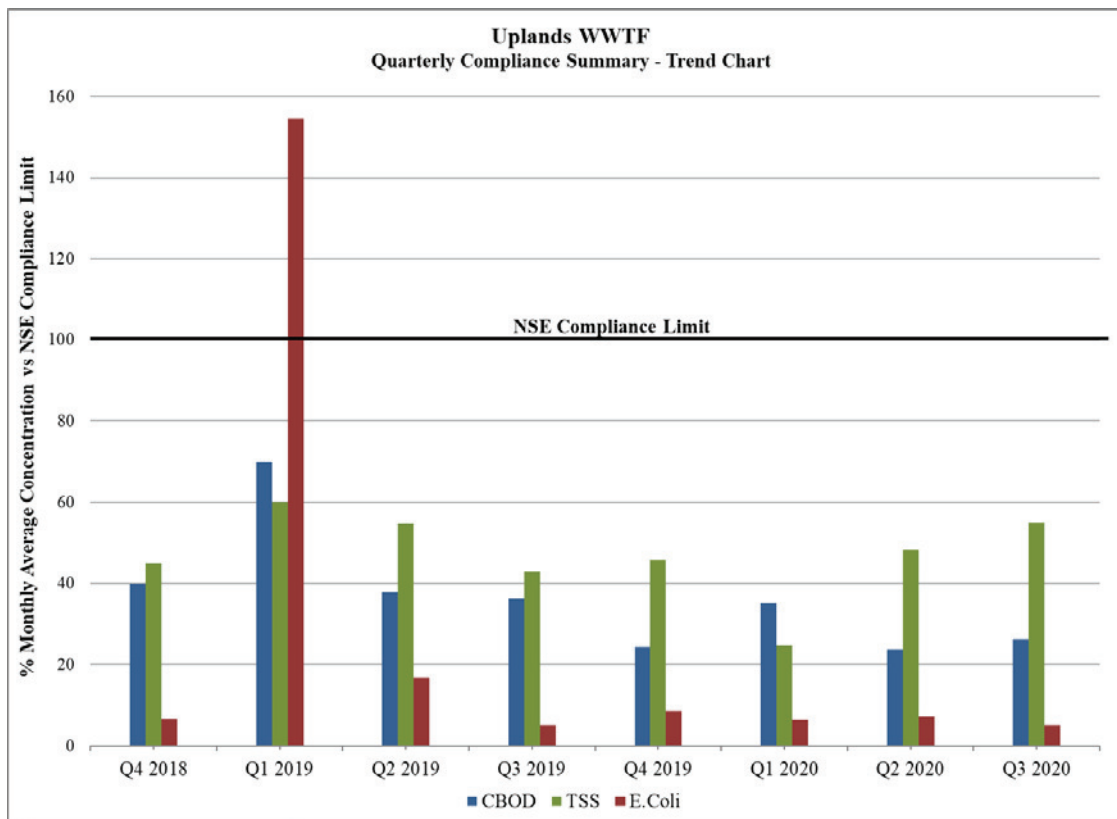
Lower numbers represent better performance.



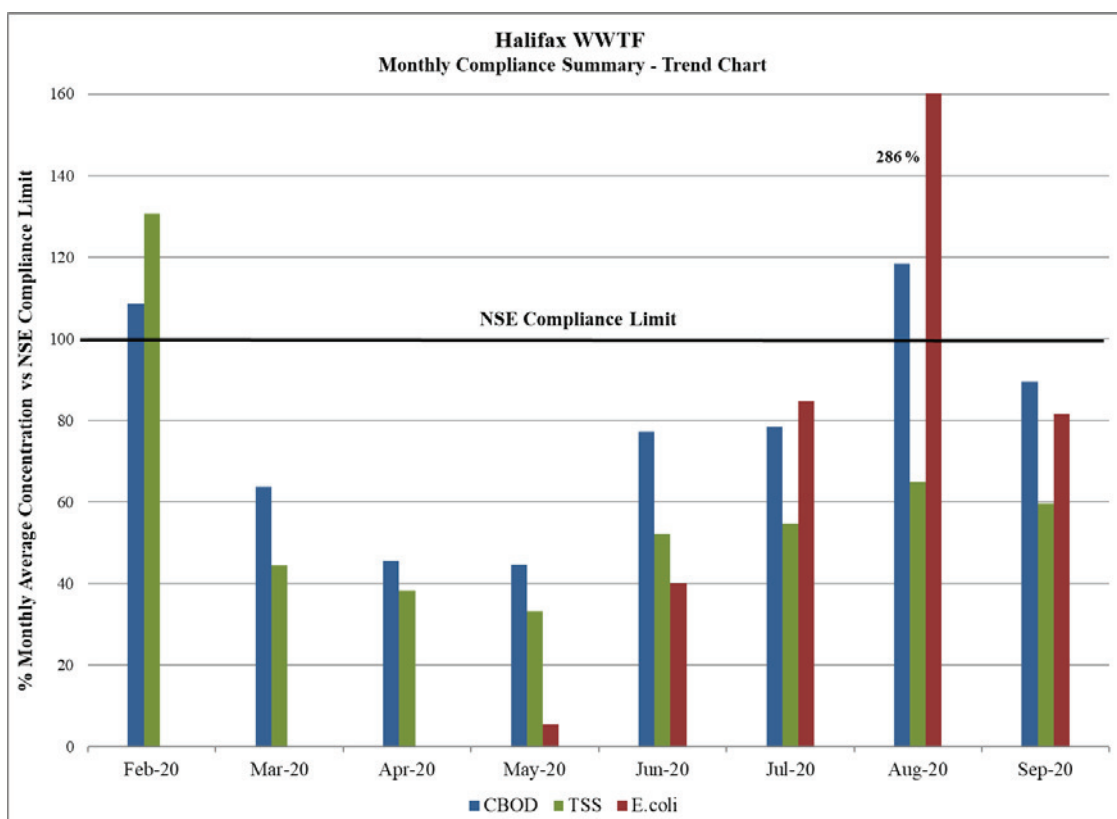
Lower numbers represent better performance.



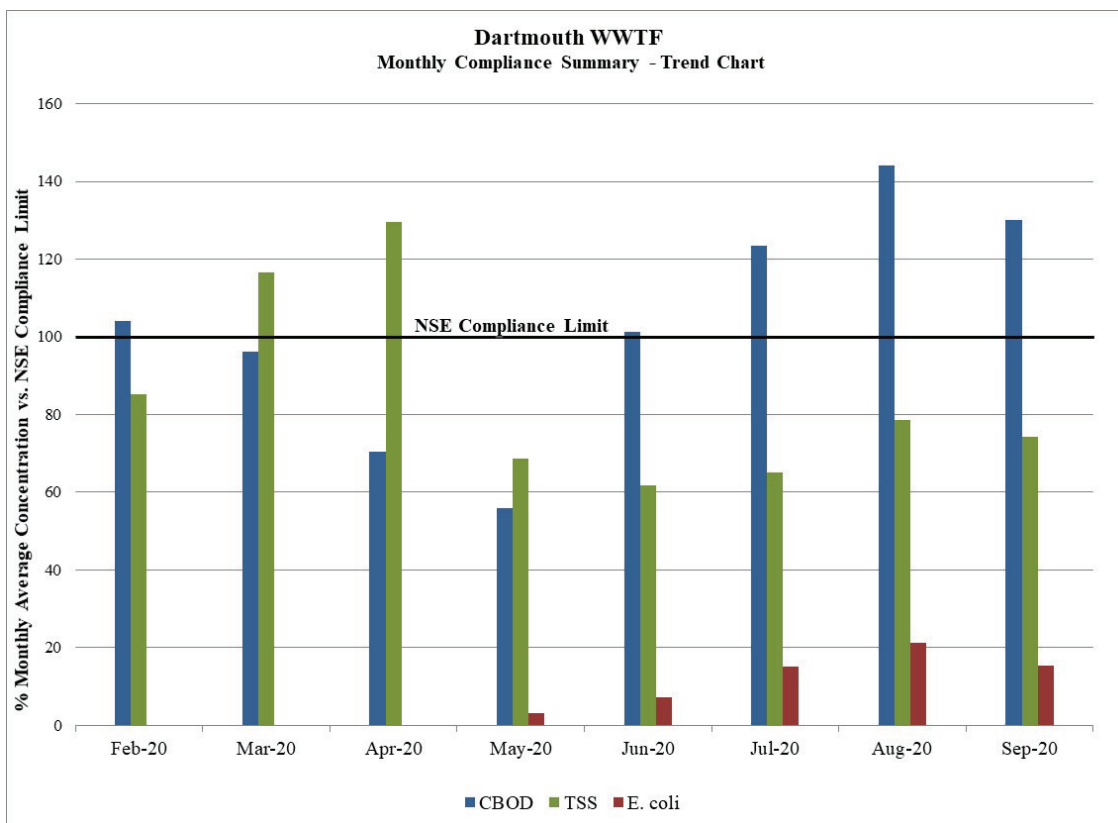
Lower numbers represent better performance.



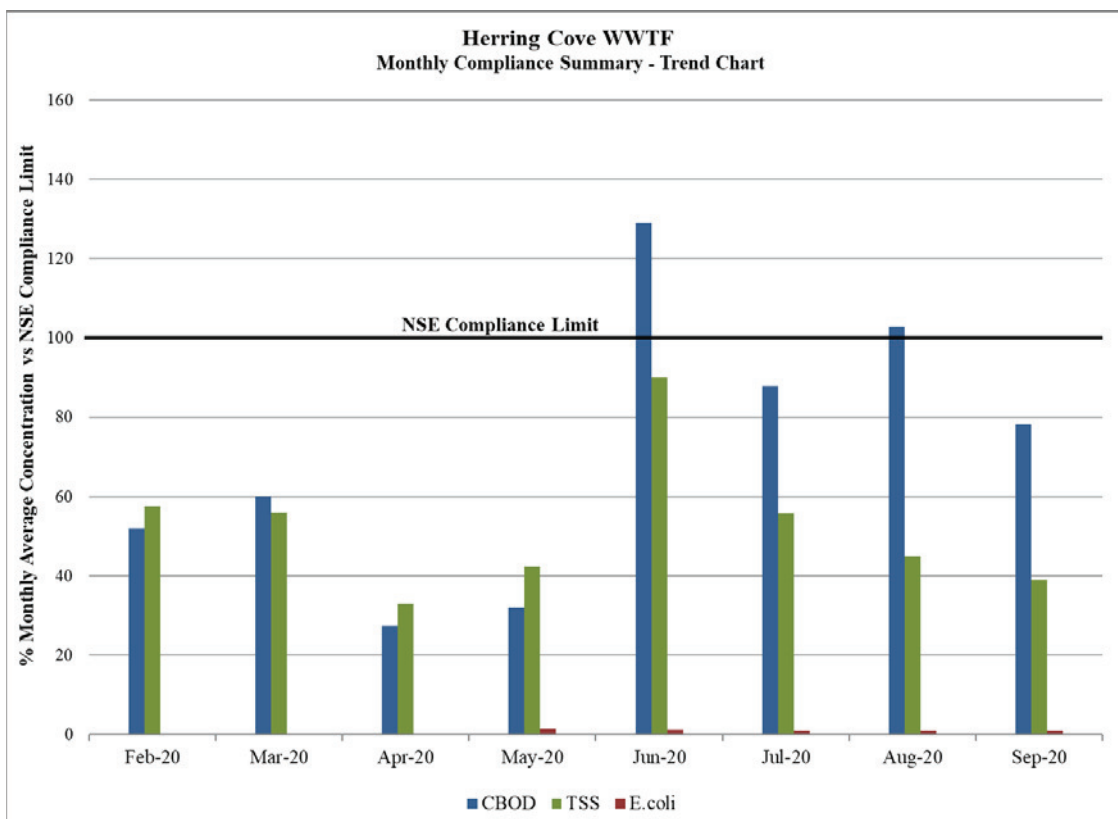
Lower numbers represent better performance.



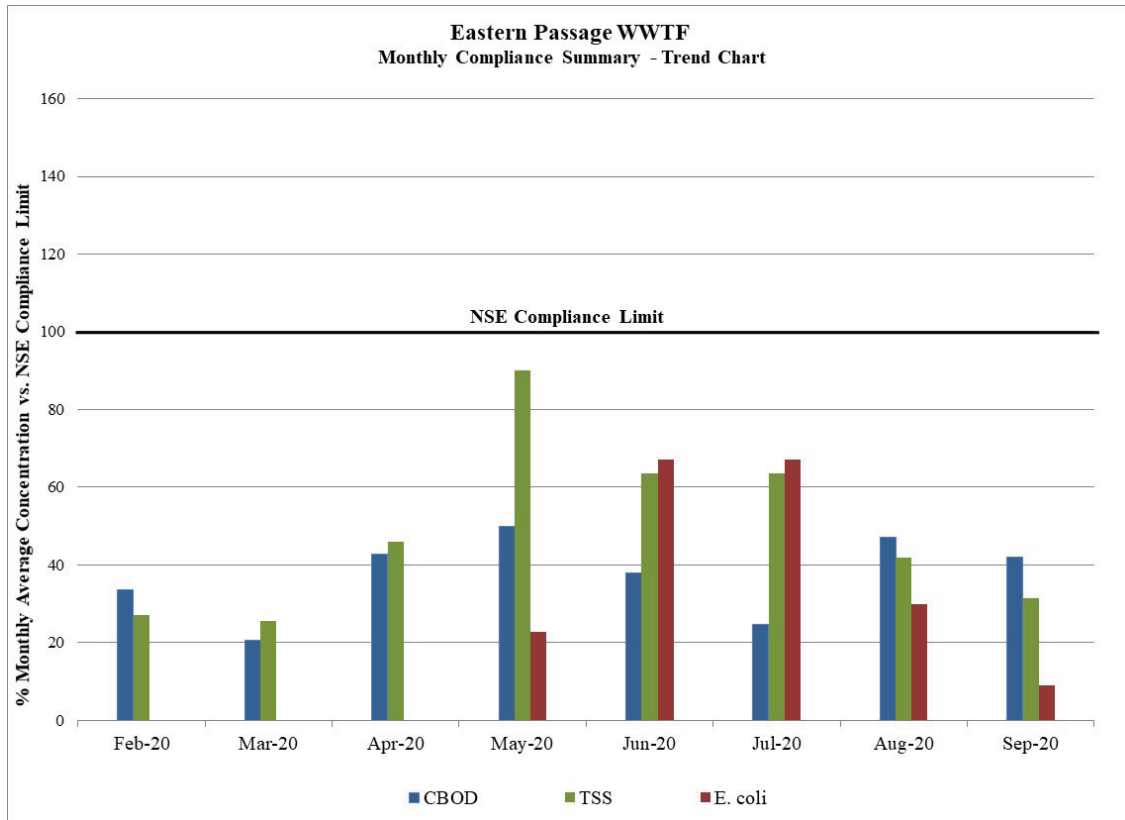
Lower numbers represent better performance.



Lower numbers represent better performance.

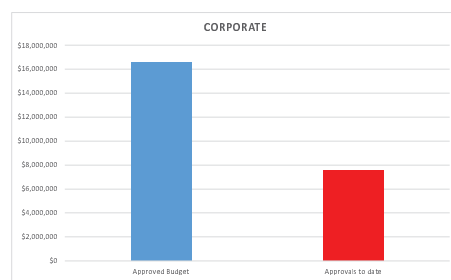
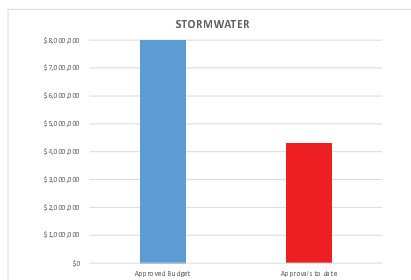
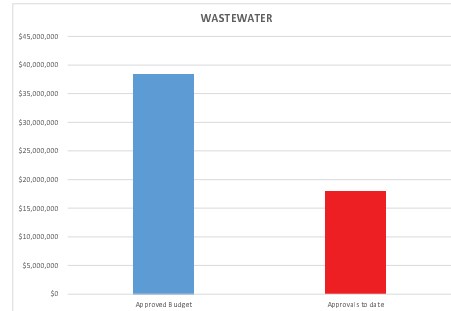
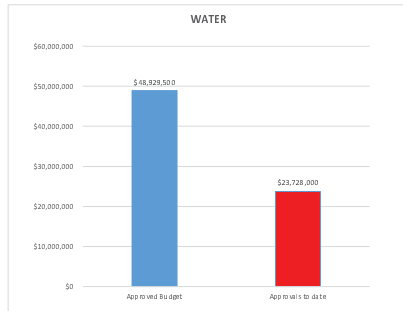


Lower numbers represent better performance.



Lower numbers represent better performance.

CAPITAL BUDGET APPROVALS TO DATE - 2020 -2021



WATER

Approved Budget	\$48,929,500
Approvals to date	\$23,728,000

WASTEWATER

Approved Budget	\$38,448,000
Approvals to date	\$17,940,500

STORMWATER

Approved Budget	\$9,136,500
Approvals to date	\$4,297,000

CORPORATE PROJECTS

Approved Budget	\$16,567,000
Approvals to date	\$7,555,900

Total Budget:	\$96,514,000
Total To Date:	\$53,521,400

Total %	55%
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Original Signed By:	November 20, 2020
Report Approved:	Date
Jamie Hannam	

HRWC Board Report #2-1
Capital Projects Funding Approvals 2020-2021

Category	Total Approved	Net Impact on Budget	Approval Date
Water			
Distribution			
Automated Flushing Program	\$20,000	\$20,000	5-Mar-20
Coburg Road Bridge Watermain Replacement	\$300,000	\$300,000	5-Mar-20
Lead Service Line Replacement Program	\$170,000	\$170,000	12-Mar-20
Water Distribution - Main Renewal Program	\$3,093,000	\$3,093,000	0-Jan-00
~ Valves Renewals	\$125,000	\$125,000	16-Jun-20
~ Hydrants Renewals	\$75,000	\$75,000	16-Jun-20
~ Service Lines Renewals	\$100,000	\$100,000	16-Jun-20
South Street CN Bridge Watermain Installation	\$25,000	\$25,000	5-Mar-20
Water Sampling Station Relocation Program	\$10,000	\$10,000	5-Mar-20
Meadowbrook PRV Chamber - Replace PRV Valves	\$35,000	\$35,000	5-Mar-20
Fall River Rechlorination Station	\$25,000	\$25,000	28-Feb-20
Spring Garden Road - Main Renewal - Design	\$37,000	\$37,000	5-Mar-20
Energy			
Energy Management Capital Program (Water)		\$100,000	
Chamber HVAC Retro-Commissioning Program		\$100,000	
Equipment			
Miscellaneous Equipment Replacement	\$50,000	\$50,000	16-Jun-20
Leak Detection Equipment	\$8,000	\$8,000	5-Mar-20
Purchase Hydraulic Saws	\$45,000	\$45,000	22-Jul-20
Land			
Watershed Land Acquisition			
Security			
Security Upgrade Program	\$50,000	\$50,000	7-Apr-20
Structures			
Eaglewood Pumping Station - New Pump Control Panel	\$35,000	\$35,000	28-Feb-20
Steel Reservoir Climbing Systems - Safety Upgrades	\$225,000	\$225,000	3-Mar-20
Bedford South (Hemlock) Reservoir CCC	\$8,410,000	\$8,410,000	28-May-20
Cowie Hill Reservoir Replacement - Design	\$200,000	\$200,000	5-Mar-20
Meadowbrook Reservoir Overflow Pipe Replacement	\$70,000	\$70,000	28-Feb-20
Mount Edward Control Chamber - Extension of Power Supply	\$20,000	\$20,000	28-Feb-20
Lake Major Dam - Site Improvements	\$240,000	\$240,000	5-Mar-20
Beaver Bank Booster Station - Pump Upgrades	\$30,000	\$30,000	10-Apr-20
Transmission			
Bedford West CCC - Various Phases			
Lakeside Timberlea CCC			
Critical Valve Replacements 2020	\$30,000	\$30,000	9-Jun-20
Chain Control Valve Upgrade Program	\$45,000	\$45,000	5-Mar-20
Transmission Main Monitoring System Pilot			
Chain Control Transmission - Peninsula Low Upsize - Design	\$100,000	\$100,000	11-Sep-20
Chain Control Transmission - Peninsula Intermediate Upsize - Design	\$100,000	\$100,000	11-Sep-20
Herring Cove Road Looping-McIntosh Street			
Tacoma PRV Chamber	\$420,000	\$420,000	9-Jun-20
Port Wallace Transmission Main - Main Street to Caledonia Road	\$6,000,000	\$6,000,000	9-Jun-20
North End Feeder Replacement - Design	\$200,000	\$200,000	21-Aug-20
Cogswell Interchange - Water Transmission Main Realignment			
Treatment Facilities			
Aerotech Booster Station Capital Upgrades			
JD Kline WSP - Process Upgrades - Phase 1 - New Clarifier and Pre-Treatment			
JD Kline WSP - Process Upgrades - Phase 1 - Backwash Optimization			
JD Kline WSP - Process Upgrades - Phase 1 - Building Improvements			
JD Kline WSP - Raw Water Valve Actuators Replacement	\$100,000	\$100,000	24-Mar-20
JD Kline WSP - Caustic Tank Liner Replacements	\$25,000	\$25,000	5-Mar-20
JD Kline WSP - Low Lift Pump Replacements			
JD Kline WSP - Replace Westinghouse Electrical Panels	\$8,000	\$8,000	21-Mar-20
JD Kline WSP - Alum Tank Liner Replacement	\$45,000	\$45,000	22-Jul-20
JD Kline WSP - New Ultrasonic Level Transmitter	\$10,000	\$10,000	5-Mar-20
JD Kline WSP - Replace Flocc Tank Valve Actuators	\$35,000	\$35,000	5-Mar-20
JD Kline WSP - Replace Filter Isolation Gates Program	\$300,000	\$300,000	5-Mar-20
Lake Major WSP - Phase 1 - Temporary Side Stream			
Lake Major WSP - Phase 1 - New Clarifiers and Pre-Treatment	\$325,000	\$325,000	21-Mar-20
Lake Major WSP - Phase 1 - Filtration System Replacement			
Lake Major WSP - Phase 1 - Raw Water Pump Station			
Lake Major WSP - Phase 1 - Building Additions			
Lake Major WSP - Butterfly Valve Replacement Program	\$350,000	\$350,000	21-Mar-20
Lake Major WSP - New Boat Launch	\$42,000	\$42,000	5-Mar-20
Lake Major WSP - Replace Fluoride Tank and Piping	\$250,000	\$250,000	5-Mar-20
Lake Major WSP - Sludge Drying Beds Improvements			
Lake Major WSP - Roof Replacement			
Lake Major WSP - Emergency Pumps - Sitework Preparations			
Lake Major WSP - Fuel Storage for Generator at Low Lift Station	\$120,000	\$120,000	20-Aug-20
Bennery Lake WSP - Surge Anticipator Valves Replacement			

Category	Total Approved	Net Impact on Budget	Approval Date
Bennery Lake WSP - Access Road Upgrade	\$1,280,000	\$1,280,000	
Bomont Equipment Upgrade	\$150,000	\$150,000	25-Apr-20
Pump Replacement Program - Small Systems	\$45,000	\$45,000	28-Feb-20
Reservoir Mixing and Residuals Management Upgrade Program	\$300,000	\$30,000	26-May-20
Lake Major WSP Clarifier Component Replacement	\$120,000	\$120,000	28-Oct-20
Water Total	\$23,798,000	\$23,728,000	
Wastewater			
Collection System			
Bedford West Collection System CCC			
Lateral Replacements WW (tree roots)	\$541,000	\$541,000	16-Jun-20
Manhole Renewals WW	\$25,000	\$25,000	16-Jun-20
Sewer Relocation at South Street CN Bridge			
Wet Weather Management Program	\$350,000	\$350,000	6-May-20
Integrated Wastewater Projects - Program	\$740,000	\$740,000	10-Feb-20
Wastewater System - Trenchless Rehabilitation Program	\$3,000,000	\$3,000,000	
Albro Lakes Watershed Separation	\$387,000	\$387,000	25-May-20
Local Network Upgrades on Beaver Bank Road - Design	\$176,000	\$176,000	18-Feb-20
Cogswell Redevelopment - Sewer Relocation			
Punch Bowl PS Elimination	\$100,000	\$100,000	18-Feb-20
Hines Road Rider Sewer Extension			
Lateral Replacements WW (non tree roots)	\$1,720,000	\$1,720,000	16-Jun-20
Wyse Road Separation Phase 1	\$43,000	\$43,000	25-May-20
Young Street - Sewer Separation			
South Park Street - Sewer Separation	\$2,417,000	\$2,417,000	19-Oct-20
College Street - Sewer Separation			
Prince Albert Road Sewer Separation - Side Streets	\$325,000	\$325,000	10-Feb-20
Shore Road Bridge Replacement WW Integrated Project	\$175,000	\$175,000	21-Mar-20
Energy			
NSPI Meter Relocations			
HHSP - BAS + HVAC Recommissioning			
Equipment			
I&I Reduction (SIR) Program Flow Meters and Related Equipment	\$25,000	\$25,000	16-Jun-20
Miscellaneous Equipment Replacement	\$120,000	\$120,000	16-Jun-20
Duffus Street PS Flow Meter Replacement	\$110,000	\$110,000	31-Aug-20
Forcemains			
Akerley Blvd Forcemain Replacement	\$65,000	\$65,000	18-Feb-20
Pumping Station Oil Tank Replacements			
Morris Lake Forcemain Investigation and Rehabilitation			
New Timberlea Pump Station Forcemain System - Design			
Security			
Security Upgrade Program	\$200,000	\$200,000	17-Mar-20
Structures			
Autoport Pleasant Street PS Replacement			
CSO Upgrade Program			
Duffus PS CSO - Modification			
Emergency Pumping Station Pump replacements			
Windmill Road PS Replacement	\$1,355,000	\$1,355,000	7-May-20
Wastewater Pumping Station Component Replacement Program - West Region			
Wastewater Pumping Station Component Replacement Program - East Region			
Wastewater Pumping Station Component Replacement Program - Central Region			
Jamieson Pumping Station - Automatic Bar Screen	\$60,000	\$60,000	3-Mar-20
Fairfield Holding Tank - Concept Design	\$150,000	\$150,000	28-Feb-20
Bruce Street Pumping Station Relocation	\$150,000	\$150,000	21-Feb-20
Wastewater Pumping Station Generator Plug/Switch Installations			
First Lake Pumping Station Upgrades	\$70,000	\$70,000	14-Apr-20
PS Control Panel / Electrical Replacement	\$725,000	\$725,000	24-Mar-20
Armscree Pumping Station - Piping and Valve Upgrades			
Bissett PS Component Upgrade			
Roach's Pond PS Component Upgrade	\$550,000	\$550,000	17-Apr-20
William's Lake PS Rehabilitation	\$100,000	\$100,000	21-Mar-20
Upgrade Quigley's Corner Pumping Station			
Optimize Quigley's Corner Pumping Station			
New Timberlea Pumping Station - Design			
Treatment Facilities			
Emergency Wastewater Treatment Facility equipment replacements	\$330,500	\$330,500	14-May-20
HHSP - OCS Wet Scrubber Chlorine Analyzers	\$40,000	\$40,000	7-Apr-20
Plant Optimization Audit Program	\$16,000	\$16,000	11-Aug-20
Wastewater Research Program Pilot Plant			
HSPs - OCS H2S Analyzers			
Duct Work Replacement	\$50,000	\$50,000	13-Oct-20
Raw Water Pump Refurbishment	\$50,000	\$50,000	27-Apr-20
Fixed Gas Meters - Replacement	\$150,000	\$150,000	27-Apr-20
New Coagulant Dosing System	\$230,000	\$50,000	21-May-62
New Polymer Dosing System			
Sludge Pumps - New Mechanical Seals	\$160,000	\$160,000	11-Jan-61
Densadeg Hydraulic Optimization	\$100,000	\$100,000	2-Apr-20
Grit System - Parts Replacements and New Screws	\$50,000	\$50,000	27-Apr-20
Sludge Dewatering - Fournier Press Upgrades	\$50,000	\$50,000	27-Apr-20

Category	Total Approved	Net Impact on Budget	Approval Date
Industrial Water System Replacement	\$150,000	\$150,000	11-Jan-61
Fine Screens - New Perforated Plate Screens	\$1,800,000	\$1,800,000	
Densadegs - CFD Analysis and Flow Diversion Vanes	\$110,000	\$110,000	16-Oct-20
Heat Exchangers - Refurbishment	\$80,000	\$80,000	14-Sep-40
Desadegs - Lamella Tube Settler Replacements	\$300,000	\$300,000	7-May-20
Ballasted Flocculation Pilot	\$75,000	\$75,000	14-May-20
Duct Work Replacement Program			
Spare Sludge Tank mixer	\$25,000	\$25,000	1-May-20
Waste Oil System - New Waste Oil Tank	\$15,000	\$15,000	1-May-20
Electrical System - Spare Transfer Switch	\$40,000	\$40,000	1-May-20
Secondary Launder Covers			
Road Rehabilitation	\$25,000	\$25,000	13-May-20
Bioreactors - Short Circuiting Modifications			
Lab - HVAC Modifications			
Centrifuge - Rebuild	\$50,000	\$50,000	13-May-20
Grit System - Chain and Bucket Replacement	\$50,000	\$50,000	13-May-20
Springfield Lake - Driveway Replacement	\$15,000	\$15,000	13-May-20
Building Upgrades	\$230,000	\$230,000	10-Nov-20
Conveyor CS1 Liners	\$30,000	\$30,000	13-May-20
Biofilter Media	\$50,000	\$50,000	13-May-20
Dryer Upgrades	\$70,000	\$70,000	13-May-20
Trunk Sewers			
Odour Level of Service and Optimization Review	\$100,000	\$100,000	25-Apr-20
Fairview Cove Trunk Sewer - Design			
Wastewater Total	\$18,120,500	\$17,940,500	
Stormwater			
Culverts/Ditches			
CORONET AVENUE DRIVEWAY CULVERT REPLACEMENT PROJECT			
Driveway Culvert Replacements	\$1,200,000	\$1,200,000	22-Jul-20
KIPAWA CRESCENT			
COLE HARBOUR ROAD, near civic 1560	\$109,000	\$109,000	26-Oct-20
ST MARGARET'S BAY ROAD, near civic 2797	\$80,000	\$80,000	3-Nov-20
BLUE FOREST LANE, near civic 42			
DEVIL'S HILL ROAD at BOULDERBROOK LANE			
31 KETCH HARBOUR RD, near civic 832			
WAVERLEY ROAD, near civic 832			
Pipes			
Catchbasin Renewals SW	\$60,000	\$60,000	16-Jun-20
Lateral Replacements SW	\$12,000	\$12,000	16-Jun-20
Manhole Renewals SW	\$15,000	\$15,000	16-Jun-20
Stormwater Pipe Condition Inspections (CSP)			
Integrated Stormwater Projects - Program	\$608,000	\$608,000	14-May-20
Sullivan's Pond Storm Sewer System Replacement - Phase 2 Irishtown Rd to Harbour	\$25,000	\$25,000	25-May-20
Raymond Street, Phase 2 - Storm Sewer Rehabilitation			
Cogswell Redevelopment - SW Sewer Relocation	\$175,000	\$175,000	21-Mar-20
Rocky Lake and Bedford Highway Intersection Storm Sewer Upgrade	\$75,000	\$75,000	1-Sep-20
Thistle Street Storm Drainage System Upgrade - Preliminary Engineering			
Stormwater System Upgrade near Civic #1681 Waverley Road	\$38,000	\$38,000	1-Sep-20
Structures			
Ellenvale Run Retaining Wall System Phase 4	\$1,900,000	\$1,900,000	
Stormwater Total	\$4,297,000	\$4,297,000	
Corporate			
Facility			
Building Capital Improvements			
East/Central Regional Operational Facility			
Energy Management Capital Program	\$30,000	\$30,000	21-Oct-20
Fleet			
Fleet - Stormwater	\$269,000	\$269,000	16-Jun-20
Fleet - Wastewater	\$1,076,000	\$1,076,000	16-Jun-20
Fleet - Water	\$610,000	\$610,000	16-Jun-20
GIS			
Engineering Drawing Database			
GIS Application Support Program	\$85,900	\$85,900	6-Apr-20
GIS Hardware/Software Program			
Sewer Service Entry			
GIS Data Program			
GIS Data Build - Services (ICI)			
GIS Data Project (CAD schematic retirement)	\$150,000	\$150,000	28-Apr-20
Utility Network Modeling/Data Modeling			
Stormwater Billing Imagery Acquisition and Analysis	\$350,000	\$350,000	14-May-20
Information Technology			
Analytics Decision Support System			
Customer Portal	\$50,000	\$50,000	22-Sep-20
Desktop Computer Replacement Program	\$350,000	\$350,000	16-Jun-20
New Payroll System			
Asset Condition			
Capital Planning			
Computerized Maintenance Management System (CMMS) Enhancements	\$410,000	\$410,000	20-Apr-20

Category	Total Approved	Net Impact on Budget	Approval Date
Disaster Recovery			
Document Management Sharepoint Rollout			
Full Enterprise Data Warehouse	\$200,000	\$200,000	20-Apr-20
Network Upgrades	\$280,000	\$280,000	16-Jun-20
SAP Rate Structure Support			
Enterprise Resource Planning Solution			
Security Projects	\$190,000	\$190,000	25-May-20
SCADA & Other			
GPS Units - Replacement	\$70,000	\$70,000	21-Feb-20
SCADA Control System Enhancements	\$100,000	\$100,000	14-Apr-20
ICS Cyber Security Enhancements	\$100,000	\$100,000	17-Apr-20
Halifax Harbour Solutions Radio Upgrade	\$60,000	\$60,000	13-May-20
Wastewater Community Plants SCADA System Relocation	\$45,000	\$45,000	25-Apr-20
PI System Enhancements	\$100,000	\$100,000	20-Apr-20
Customer Meters - New and Replacement	\$500,000	\$500,000	16-Jun-20
Asset Management			
Corporate Flow Monitoring Program	\$1,870,000	\$1,870,000	
Storm Sewer Condition Assessment	\$95,000	\$95,000	1-Apr-20
Wastewater Sewer Condition Assessment	\$215,000	\$215,000	1-Apr-20
Vulnerability to Climate Change Risk Assessment-Asset Class Pilot			
Outfall Assessment Project			
SSO Management Program	\$100,000	\$100,000	11-Sep-20
System Constraints Analysis HRM (was East Additional Flow Monitoring)			
Safe Yield Study	\$200,000	\$200,000	26-May-20
New Hydraulic Model (infoWater)			
Transmission Main Risk Assessment and Prioritization Framework	\$50,000	\$50,000	11-Sep-20
Corporate Total	\$7,555,900	\$7,555,900	
Grand Total	\$53,771,400	\$53,521,400	#####

ITEM # 3-I
Halifax Water Board
26-Nov-20

FINANCIAL REPORT - Bank Balance

Consolidated Bank Balance

As of: November 13, 2020 \$66,724,525

Investment Rate of Return:

For month of: October 2020 0.078%

Annual: 0.940%

Halifax Water Compliance Statement
Quarterly Certification

For the period of July 1, 2020 to September 30, 2020

We hereby certify that the Halifax Regional Water Commission is current in making all statutory remittances for payroll taxes, Harmonized Sales Tax and other remittances as required under the laws of the Government of Canada and its Provinces (the significant remittances are noted in the appendix) and that all legal claims have been disclosed.

**Cathie
O'Toole**

Digitally signed by Cathie
O'Toole
Date: 2020.11.19
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Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

**Louis de
Montbrun**

Digitally signed by Louis
de Montbrun
Date: 2020.11.19
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Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

Dated:

November 19, 2020

Halifax Water Compliance Statement
Quarterly Certification
Appendix I

Significant statutory remittances for payroll taxes, Harmonized Sales Tax and other remittances as required under the laws of the Government of Canada and its Provinces for the Halifax Regional Water Commission.

Statutory Payroll Remittances

- **Canada Revenue Agency (CRA)** - Statutory employee payroll deductions and employer related contributions for:
 - Income Tax
 - Canada Pension Plan (CPP)
 - Employment Insurance (EI)
- **Workers' Compensation Board of Nova Scotia (WCB)** – Employer remittance based on employee payroll

Other Payroll Remittances

- **Northern Trust** - Employee payroll deductions and employer contributions to Halifax Water and HRM defined benefit pension plans
- **Industrial Alliance** – employer and employee contributions to defined contribution pension plan
- **Medavie Blue Cross & SSQ** – employee payroll deductions and employer related contributions for Health & dental, LTD, and Life benefit coverage, and payroll deductions for AD&D
- **Canadian Union of Public Employees** – Employee payroll deductions of union dues
 - CUPE Local 227
 - CUPE Local 1431

HST and Other Remittances

- **Canada Revenue Agency (CRA)** - Harmonized Sales Tax (HST) is filed online and a refund issued as HST paid is greater than HST collected
- **Workers' Compensation Board of Nova Scotia (WCB)** – Remittance for sub-contractors

Quarterly Remittance Certification

Appendix II

Period: July to Sept 2020

<u>Vendor</u>	<u>Vendor #</u>	<u>Items Remitted</u>	<u>Total remitted</u>	<u>Exceptions</u>
Statutory Payroll Remittances				
CRA	174	Tax, CPP, EI, WCB	\$3,226,410.61	
Other Payroll				
Northern Trust	1215	HW Pension Plan	\$ 1,493,089.46	
Northern Trust	1216	HRM Pension Plan	\$ 251,260.02	
Manulife Financial	1171	Bedford Pension Plan	\$ 1,764.70	
Industrial Alliance	2971	DCPP	\$ 2,459.98	
Medavie Blue Cross	340, 3101	Health, Dental, Life, LTD	\$ 616,931.30	
SSQ Insurance	429	AD&D	\$ 5,076.49	
CUPE	160	Union Dues 1431	\$ 27,280.56	
CUPE	161	Union Dues 227	\$ 50,324.00	

Other payroll not noted

United Way, Credit Union, Garnishments (WCB, CRA, Family Court, Sherriff's Office),
Water for People, Salvation Army, Racially Visible Caucus

HST and Other

CRA	N/A	HST (refunds)	\$ (1,801,695.52)	
Receiver General	210	WCB subcontractors	\$ 208.98	

Exceptions, errors and/or late remittances

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board as Trustees of the
Halifax Regional Water Commission Employees' Pension Plan

SUBMITTED BY: Louis de
Montbrun

Digitally signed by Louis
de Montbrun
Date: 2020.11.19
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Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

APPROVED: Cathie
O'Toole

Digitally signed by Cathie
O'Toole
Date: 2020.11.19
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Cathie O'Toole, MBA, CPA, CGA, ICD.D
General Manager

DATE: November 16, 2020

SUBJECT: **Halifax Regional Water Commission Employees' Pension Plan
Financial Report Third Quarter, 2020**

INFORMATION REPORT

ORIGIN

Financial reporting for the Halifax Regional Water Commission Employees' Pension Plan (the "Plan").

BACKGROUND

The Halifax Water Board as Trustees of the Plan review the periodic (quarterly) financial results of the Plan throughout the year.

DISCUSSION

The attached statement of changes in net assets available for benefits (Appendix A) outlines the annual budget for the Plan and actual financial performance for the third quarter, January 1 to September 30, 2020. Favourable or unfavourable variances reported compare

actual results to pro-rated budget amounts, for the nine (9) month period ended September 30, 2020. Year-end audited results for 2018 and 2019 are shown for comparative purposes. As shown on the statement of changes in net assets available for benefits, net assets available for benefits for the period have increased \$4.0 million. The pro-rated budget forecasted an increase in net assets available of \$5.1 million. The difference of \$1.1 million is an unfavourable variance.

The annual budget forecasted revenue of \$6.0 million. Revenue for the period was \$3.1 million, which when compared to the pro-rated budget of \$4.5 million results in an unfavourable variance of \$1.4 million. Revenue is affected largely by the performance of the Halifax Regional Municipality Master Trust (the “Master Trust”), and the revenue tends to be more volatile when compared to contributions and expenses of the Plan. This variance is attributed directly to the change in the fair value of the investment assets at September 30, 2020. The increase in the fair value of investment assets for the period totaled \$0.6 million compared to the pro-rated budget of \$2.3 million, resulting in an unfavourable variance of \$1.6 million. Capital markets began to fall in mid-February 2020, which coincided with the outbreak of COVID-19. By the end of March 2020, asset values of the Plan were down approximately 4.7% or \$6.7 million compared to total assets of \$141.2 million as at December 31, 2019. April 2020 saw one of the best markets ever globally, and the best month for US stocks since 1987, spurring a recovery in the second and third quarters. Investment income for the period performed above expectations, showing a favorable variance of \$0.2 million or 9%. Reported returns of the Master Trust for the second and third quarters were 4.7% and 2.5% respectively, for a year-to-date return of 2.0%.

Contributions of \$4.7 million are tracking slightly under the pro-rated budget of \$4.8 million by \$0.1 million or 2% as a result of timing differences throughout the year of projected new hires.

Expenses of \$3.9 million for the period are lower than the pro-rated budget of \$4.2 million resulting in a favourable variance of \$0.3 million or 8%. The main contributor to this variance is termination payments which are lower than the pro-rated budget estimate.

SERVICE STANDARDS

Tracking of Regulatory Filing Requirements, Administrative Reporting Requirements and Service Standards for actuarial calculation requests is ongoing.

The reports for Regulatory Filing Requirements and Administrative Reporting Requirements are attached as Appendix B and Appendix C respectively, and document administrative compliance within the various levels of reporting for the period. The Plan is in compliance with all Regulatory Filing Requirements noted.

Service Standard results for the third quarter (July 1 to September 30, 2020) are attached as Appendix D. The intent of the service standards report is to set a standard number of days for which calculations can be provided to members when actuarial calculations are requested. The service standard includes both estimated number of days required by the current actuarial service provider, Eckler Partners Ltd., and estimated Halifax Water staff time.

The overall results outlined for the third quarter as reported in Appendix D show, out of 2 requests, 1 was delivered within the standard days proposed under the threshold limits. Response time of the actuary was below expectations for this 1 request. For the actuary, service days for the 1 Termination Estimate was 21 days compared to a standard of 11. There was also a Marriage Breakdown calculation estimate which the actuary delivered within the standard 15 days.

For the administrative staff, the Termination Estimate and Marriage Breakdown Estimate were provided within 12 days and 13 days respectively compared to the standard of 12 days and 18 days.

After reviewing results over the past 2 years, with regards to standards and administrative processes, changes have been implemented for 2020 in an effort to enhance service standard reporting taking into account types of requests and circumstances that may affect timing of responses. Discussions have taken place with internal staff, focusing on efficiency and process improvement. The response time from Eckler has shown improvement, exhibiting their commitment to respond within the prescribed service standards set.

ATTACHMENTS

APPENDIX A – Financial Report - Statement of changes in net assets available for benefits, for the nine (9) month period ended September 30, 2020

APPENDIX B – Regulatory Filing Requirements – 2020

APPENDIX C – Administrative Reporting Requirements – 2020

APPENDIX D – Service Standards Report - 2020

Report Prepared by:

**Heather
Britten**

Digitally signed by
Heather Britten
Date: 2020.11.19
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Heather S. Britten, B.Comm.
Quality Assurance Officer (902) 490-1895

Halifax Regional Water Commission Employees' Pension Plan
Statement of changes in net assets available for benefits
For the nine (9) month period ended September 30, 2020
Benchmark 75%

	September 30, 2020					Actual	Actual
	2020 Budget	Actual	Prorated Budget 75%	Variance Actual versus Prorated Budget Favourable (Unfavourable)		(Audited) 2019	(Audited) 2018
				\$	%		
Revenue							
Net investment income:							
Total investment income	\$3,240,000	\$2,636,942	\$2,430,000	\$206,942	9%	\$3,644,079	\$2,939,026
Investment manager fees	(\$230,000)	(\$149,076)	(\$172,500)	\$23,424	(14%)	(\$202,574)	(\$165,670)
Increase (decrease) in the fair value of investment assets	\$3,000,000	\$617,216	\$2,250,000	(\$1,632,784)	(73%)	\$10,642,209	\$1,763,098
	<u>\$6,010,000</u>	<u>\$3,105,082</u>	<u>\$4,507,500</u>	<u>(\$1,402,418)</u>	<u>(31%)</u>	<u>\$14,083,715</u>	<u>\$4,536,454</u>
Contributions							
Participants:							
Current service (including additional voluntary contributions)	\$3,236,000	\$2,381,567	\$2,427,000	(\$45,433)	(2%)	\$3,463,328	\$2,845,791
Sponsors:							
Current service	\$3,155,000	\$2,323,641	\$2,366,250	(\$42,609)	(2%)	\$2,972,138	\$2,578,842
Unfunded liability	\$0	\$0	\$0	\$0	0%	\$0	\$825,200
	<u>\$6,391,000</u>	<u>\$4,705,208</u>	<u>\$4,793,250</u>	<u>(\$88,042)</u>	<u>(2%)</u>	<u>\$6,435,466</u>	<u>\$6,249,833</u>
Expenses ³							
Benefit payments:							
Benefit payments	\$4,642,000	\$3,412,676	\$3,481,500	\$68,824	2%	\$4,226,855	\$3,848,218
Termination payments	\$800,000	\$365,485	\$600,000	\$234,515	39%	\$960,187	\$79,849
Death benefit payments	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Administrative:							
Actuarial & consulting fees	\$75,000	\$11,598	\$56,250	\$44,652	79%	\$118,659	\$50,409
Audit & accounting fees	\$9,000	\$0	\$6,750	\$6,750	100%	\$8,530	\$8,441
Bank custodian fees	\$25,000	\$21,545	\$18,750	(\$2,795)	(15%)	\$28,636	\$32,303
Insurance	\$9,000	\$8,760	\$6,750	(\$2,010)	(30%)	\$8,760	\$8,347
Miscellaneous	\$15,000	\$14,875	\$11,250	(\$3,625)	(32%)	\$20,610	\$16,195
Professional fees	\$15,000	\$17,284	\$11,250	(\$6,034)	(54%)	\$23,261	\$13,440
Registration fees	\$3,000	\$0	\$2,250	\$2,250	100%	\$2,500	\$2,337
Training (Trustees/ Administration/ Pension Committee)	\$2,000	\$0	\$1,500	\$1,500	100%	\$0	\$0
	<u>\$5,595,000</u>	<u>\$3,852,223</u>	<u>\$4,196,250</u>	<u>\$344,027</u>	<u>8%</u>	<u>\$5,397,997</u>	<u>\$4,059,539</u>
Increase (decrease) in net assets available for benefits	<u>\$6,806,000</u>	<u>\$3,958,067</u>	<u>\$5,104,500</u>	<u>(\$1,146,433)</u>	<u>(22%)</u>	<u>\$15,121,184</u>	<u>\$6,726,748</u>
Net assets available for benefits, beginning of period	\$141,579,813	\$141,579,813				\$126,458,630	\$119,731,882
Increase (decrease) in net assets available for benefits	<u>\$6,806,000</u>	<u>\$3,958,067</u>				\$15,121,184	\$6,726,748
Net assets available for benefits, end of period	<u>\$148,385,813</u>	<u>\$145,537,880</u>				<u>\$141,579,813</u>	<u>\$126,458,630</u>

Halifax Regional Water Commission Employees' Pension Plan
Regulatory Filing Requirements - 2020
as at September 30, 2020

Report	Regulatory Body	Filing Deadline	Date last filed		Comments
1 Annual Form 3 - Summary of Contributions	Superintendent of Pensions	60 days after the beginning of each fiscal year	February 19, 2020	DB Plan	Filed directly with the Trustee, Northern Trust, for the DB Plan.
			February 18, 2020	DC Plan	Filed directly with the Trustee, Industrial Alliance, for the DC Plan.
2 Pension Plan Income Tax Return (T3)	Canada Revenue Agency	March 31st	March 13, 2020	DB Plan	CRA requires Northern Trust as the custodian to prepare and file T3 Income Tax Returns each year. Information obtained from HRM Pension Plan quarterly report.
3 Pension Plan Audited Financial Statements	Superintendent of Pensions	6 months after the Plan's fiscal year end	July 16, 2020	DB Plan	Audited financial statements were completed and approved by the HW Board on June 25th, 2020. (Extension granted in 2020)
			July 16, 2020	DC Plan	Audited financial statements are not prepared for this pension plan. However, Industrial Alliance provides a Financial Report detailing all pertinent details of the plan. This report is submitted to the regulatory body prior to June 30th each year. (Extension granted in 2020)
4 Annual Information Returns (AIR)	Superintendent of Pensions	June 30th	July 16, 2020	DB Plan	Extension granted in 2020
			July 16, 2020	DC Plan	Extension granted in 2020
5 Actuarial Valuation*	Superintendent of Pensions Canada Revenue Agency	September 30th	September 27, 2019 September 27, 2019		Actuarial Valutaion was conducted as of January 1, 2019.
6 Plan Amendments	Superintendent of Pensions	60 days after the amendment approved by the Board	September 27, 2019	DB Plan	Amendment #12 approved by the Board June 20, 2019; Submitted to the Superintendent September 27, 2019. The amendment was pursuant to the contribution rate change as dictated by the Actuarial Valuation of January 1, 2019.
	Canada Revenue Agency		September 27, 2019		
	Superintendent of Pensions Canada Revenue Agency	60 days after the amendment approved by the Board	n/a	DC Plan	All documents relating to the registration of the DC Plan were received by the Superintendent October 6, 2017.

* Actuarial Valuations are required at a minimum every three (3) years.

** Notional Agreements were implemented during 2017 with an effective date for January 1, 2017. Notional Agreements are not registered therefore not subject to reporting requirements to a regulatory body.

Halifax Regional Water Commission Employees' Pension Plan
Administrative Reporting Requirements - 2020
as at September 30, 2020

Report	Filing Deadline/ Recurrence	Date last filed/ Performed		Comments
1 Pensioners' Payroll	Monthly	November 1, 2020		Pensioners are paid the 1st of each month; no exceptions to report for the Third Quarter 2020.
2 Contributions to the Trustee	Monthly	October 20, 2020	DB Plan	Remittances due to Northern Trust within 30 days of month end; no exceptions to report for Third Quarter 2020.
		November 10, 2020	DC Plan	Remittances due to Industrial Alliance within 30 days of month end; no exceptions to report for Third Quarter 2020.
		n/a	Notional Agreement*	
3 Pension Plan Financial Statements	Quarterly	November 26, 2020	DB Plan	Third Quarter (January - September 2020)
		n/a	DC Plan	Quarterly statements are not prepared for the Defined Contribution (DC) Plan. A financial report is prepared by Industrial Alliance and that report is filed with the Annual Information Return (AIR) to the regulator annually.
		n/a	Notional Agreement*	Financial statements not required.
4 Investment Performance Review & Compliance with SIP&P	Quarterly	November 26, 2020	DB Plan	Second Quarter (April - June 2020) Report prepared quarterly by administration staff for the HW Board of Directors, in conjunction with the quarterly HRM Pension Plan Committee meeting documentation. Statement of Investment Policies & Procedures (SIP&P) is reviewed annually and was last reviewed and approved on December 5, 2019.
5 Annual Pension Statements to Members	June 30th	June 18, 2020	DB Plan	Statements issued annually by June 30th.
		June 18, 2020	DC Plan	Statements issued annually in conjunction with the Defined Benefit (DB) Plan statements. Members also have access to online, real-time reporting.
		June 18, 2020	Notional Agreement*	Statements issued annually in conjunction with the DB Plan statements.
6 Fiduciary Liability Insurance	Annually	November 13, 2019	DB Plan	Reviewed and renewed annually by administration staff. The policy period expires November 30 each year.

* Notional Agreements were implemented during 2017 with an effective date for January 1, 2017. Notional Agreements are not registered therefore not subject to reporting requirements to a regulatory body.

Halifax Regional Water Commission Employees' Pension Plan
Service Standards Report - 2020

Third Quarter (as at September 30, 2020)			Eckler				HW Staff				Total Average Service Days
Transaction	Standard		Total # Completed	# Past Standard	% with Standard	Average Service Days	Total # Completed	# Past Standard	% with Standard	Average Service Days	
Retirement Estimates	18	Business Days	0	0			0	0			0
Marriage Breakdown Calculations	28	Business Days	1	0	100%	15	1	0	100%	13	28
Post-Retirement Death Letter	10	Business Days	0	0			0	0			0
Pre-Retirement Death Benefit	28	Business Days	0	0			0	0			0
Termination Estimates/ Calculations											
- Standard	18	Business Days	1	1	0%	21	1	0	100%	8	29
- Non Standard (incl RTAs)	28	Business Days	0	0			0	0			0
Total			2	1	50%	18	2	0	100%	11	
			Total # Completed		# Past Standard		% within Standard				
Combined Total (Eckler & Halifax Water)			2		1		50%				

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board as Trustees of the Halifax
Regional Water Commission Employees' Pension Plan

SUBMITTED BY: Louis de
Montbrun
Digitally signed by Louis
de Montbrun
Date: 2020.11.19
15:00:02 -04'00'
Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

APPROVED: Cathie
O'Toole
Digitally signed by Cathie
O'Toole
Date: 2020.11.19
15:14:48 -04'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: November 16, 2020

SUBJECT: Halifax Regional Municipality Master Trust
Investment Performance, Second Quarter, 2020

INFORMATION REPORT

ORIGIN

The Halifax Regional Municipality Master Trust (the "Master Trust") investment performance is reported to the Halifax Water Board as Trustees of the Halifax Water Employees' Pension Plan (the "Plan") periodically throughout the year.

BACKGROUND

None

DISCUSSION

The tables below and the attached Investment Report provide a performance update for the second quarter of 2020 (April to June) for the Master Trust, of which the "Plan" is a part. The fair value of the investment in the Master Trust is determined and updated at year-end, and the Plan's share in the Master Trust at December 31, 2019 was 6.3%, totaling \$141.2 million.

ITEM # 6-I
Halifax Water Board
November 26, 2020

The Master Trust returned 4.7% in the second quarter, which underperformed the policy benchmark of 6.5% by 1.8%. The return for the 1-year period ended June 30, 2020 was 4.8%, matching the policy benchmark. Other historical returns are provided in Table 1 below.

Table 1 – Returns

	Current				Since
	Quarter		3 - Year	4 - Year	Inception
	(Apr to Jun)	1-Year	Annualized	Annualized	(Oct 1999)
Fund Return	4.7%	4.8%	6.4%	7.6%	7.0%
Policy Benchmark	6.5%	4.8%	5.5%	6.4%	5.6%
Excess Return	(1.8%)	0.0%	1.0%	1.3%	1.4%

Total fund returns are subject to investment management fees and plan expenses.

As at June, 30, 2020 the Master Trust was in compliance with the Statement of Investment Policies and Procedures (SIP&P), and a summary of the asset mix is provided in Table 2 below:

Table 2– Asset Mix, as at June 30, 2020

Asset:	Actual	Policy
Cash & Equivalents	0.5%	0.0%
Canadian Equity	4.5%	5.4%
Global Equity	30.8%	29.5%
Fixed Income	32.4%	35.8%
Minimum Target Return	31.8%	29.3%

ATTACHMENT

2020 Second Quarter Halifax Regional Municipality Master Trust Investment Report.

Report Prepared by:

**Heather
Britten**

Digitally signed by
Heather Britten
Date: 2020.11.19
12:42:30 -04'00'

Heather S. Britten, B. Comm.
Quality Assurance Officer (902) 490 1895



Investment Report

Q2 2020

Consent Agenda Item No. 1



Executive Summary

Compliance

- As at June 30, 2020, the Master Trust (MT) was in compliance with the SIP&P.

Funded Status

- As at December 31, 2018, the going concern funded ratio and transfer ratio were 93.1% and 64.2% respectively.*

Master Trust Performance (net of fees)

- In Q2, the MT earned 4.74%, underperforming the policy benchmark return by 1.76%.
- For the one-year period ending June 30, 2020, the MT earned 4.84% performing the same as the policy benchmark.
- The MT earned an annualized return of 7.63% over the 4-year period ending June 30, 2020, outperforming the policy benchmark by 1.26% annualized.
- Since inception (October 1999), the MT earned 6.98% annualized, outperforming the Plan's long-term discount rate of 6.10%. The table on the next slide summarizes the calendar year returns for the MT.

* Per Eckler Valuation Report as at December 31, 2018. Assumes a going concern discount rate of 6.10%. Eckler will provide an update on the December 31, 2019 funded ratio and transfer ratio during the September Pension Committee meeting.



Executive Summary – Cont.

Calendar Returns (net of fees)





Executive Summary – Cont.

Added Value

- In Q2 of 2020, the MT underperformed its policy benchmark by 1.76%. Attribution: Global Credit +0.88%, Emerging Equity +0.37%, Universe Bonds +0.15%, EAFE Equity +0.02%, US Equity -0.05%, Canadian Equity -0.30%, World Equity -0.62% and Minimum Target Return -2.21%.

Q2 Updates

- Committed USD 15mn to a middle market private equity fund focused on opportunities in North America.
- Rebalanced CAD 10mn from Canadian Government Bond to Canadian Corporate Bond.
- Rebalanced CAD 10mn from Canadian Government Bond Overlay to Canadian Corporate Bond.
- Rebalanced CAD 20mn from global equity factor portfolio to Canadian Corporate Bond and cash.



Total Fund Net Returns

As of June 30, 2020

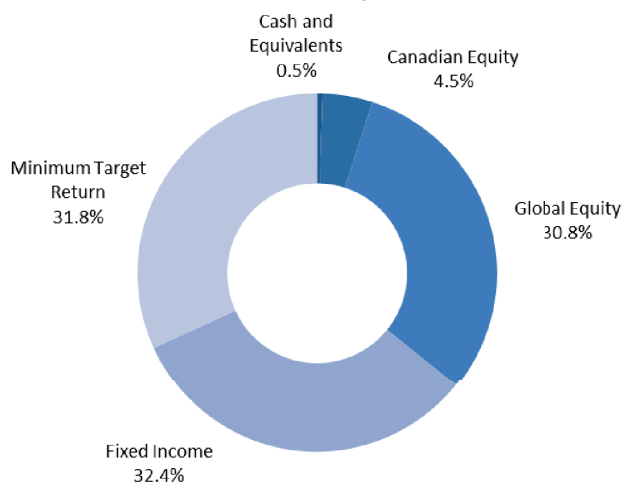
	Q2	1-Year	3-Year Annualized	4-Year Annualized	Since Inception (Oct 1999)
Fund Return	4.74%	4.84%	6.44%	7.63%	6.98%
Policy Benchmark*	6.50%	4.84%	5.49%	6.37%	5.62%
Excess Return	-1.76%	0.00%	0.95%	1.26%	1.36%

* Effective June 30, 2020, the Policy Benchmark is 3.5% S&P/TSX Index + 1.9% S&P/TSX 60 + 6.1% S&P 500 Index (\$USD) + 8.0% MSCI EAFE Index (\$CAN) + 3.8% MSCI Emerging Markets (\$CAN) + 11.6% MSCI World (\$CAN) + 17.1% FTSE TMX Canada Universe Bond + 18.7% 3 Month Bankers Acceptance + 29.3% Minimum Target Return.

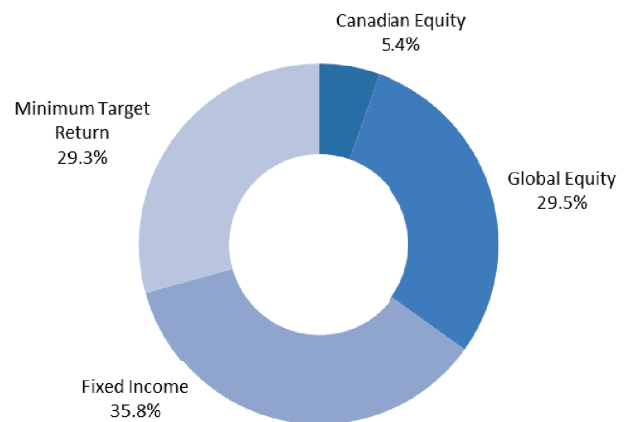
Fund returns are shown net of fees and expenses

Asset Mix

**Asset Mix
As of June 30, 2020**



**Asset Mix Policy
As of June 30, 2020**



* Effective June 30, 2020, the Policy Benchmark is 3.5% S&P/TSX Index + 1.9% S&P/TSX 60 + 6.1% S&P 500 Index (\$USD) + 8.0% MSCI EAFE Index (\$CAN) + 3.8% MSCI Emerging Markets (\$CAN) + 11.6% MSCI World (\$CAN) + 17.1% FTSE TMX Canada Universe Bond + 18.7% 3 Month Bankers Acceptance + 29.3% Minimum Target Return.

Equity Market Returns

As of June 30, 2020

Index	Q2	1-Year	3-Year Annualized	4-Year Annualized
Canadian Equity (S&P/TSX Composite Index)	16.97%	-2.17%	3.91%	5.65%
US Equity (S&P 500 C\$)	15.35%	12.05%	12.50%	13.83%
US Equity (S&P 500 U\$)	20.54%	7.51%	10.73%	12.48%
EAFE Equity (MSCI EAFE C\$)	9.93%	-1.12%	2.42%	6.62%
Emerging Markets (MSCI EM C\$)	12.99%	0.70%	3.53%	8.25%
World Equity (MSCI World C\$)	14.21%	7.19%	8.41%	10.78%

Equity markets rebounded with the easing of Covid-19 lockdowns and early signs of economic recovery in Q2.

- US equities outperformed major equity markets.

*Source: Northern Trust



Public Equity – Q2 Summary

- The MT's Equity portfolio returned 13.12% during the quarter, underperforming the equity policy benchmark return of 14.54% by 1.42%, primarily due to underperformance of Canadian and World equities.

As of June 30, 2020 (C\$ returns)

	Q2			One year		
	Plan	Benchmark	Relative Performance	Plan	Benchmark	Relative Performance
Canadian Equity	13.60%	16.27%	-2.67%	-5.73%	-1.89%	-3.84%
US Equity	21.06%	20.54%	0.52%	4.90%	7.51%	-2.61%
EAFE Equity	9.92%	9.93%	-0.01%	-0.83%	-1.12%	0.29%
Emerging Equity	18.12%	12.99%	5.13%	1.28%	0.70%	0.58%
World Equity	10.22%	14.21%	-3.99%	3.33%	7.19%	-3.86%
Total	13.12%	14.54%	-1.42%	1.07%	3.27%	-2.20%

*Source: Northern Trust



Bond Market Returns

As of June 30, 2020

Index	Q2	1-Year	3-Year Annualized	4-Year Annualized
Canadian Universe Bonds (FTSE TMX Canada Universe Bond)	5.87%	7.88%	5.28%	3.94%
Canadian Government Bonds (FTSE TMX Canada Universe Government)	5.08%	8.36%	5.40%	3.78%
Canadian Corporate Bonds (FTSE TMX Canada Universe Corporate)	8.09%	6.63%	4.99%	4.38%

- Corporate bonds have outperformed Government bonds and the broader Universe over the Q2 and 4-year periods.
- Government bond yields saw little change in the quarter.

*Source: Northern Trust



Public Fixed Income – Q2 Summary

- The MT's diversified Fixed Income portfolio earned 4.73%, which outperformed its benchmark return of 2.86% by 1.87%, primarily due to outperformance of Global Credit.

As of June 30, 2020 (C\$ returns)

	Q2			One year		
	Plan	Benchmark	Relative Performance	Plan	Benchmark	Relative Performance
Canadian Corporate Bond	8.47%	8.09%	0.38%	7.17%	6.63%	0.54%
Government Bond	4.54%	5.08%	-0.54%	8.65%	8.36%	0.29%
Global Credit Absolute Return	3.03%	0.15%	2.88%	1.27%	1.58%	-0.31%
Total	4.73%	2.86%	1.87%	4.87%	4.57%	0.30%

*Source: Northern Trust



Private Market – Q2 Summary

- The Minimum Target Return portfolio (private investment portfolio) returned -2.94% in Q2, versus a benchmark of 1.49%, underperforming by 4.43%.

As of June 30, 2020 (C\$ returns)

	Q2	1-Year	3-Year Annualized	4-Year Annualized	Since Inception (Oct 1999)
MTR Return	-2.94%	9.50%	10.71%	11.22%	12.35%
Policy Benchmark	1.49%	6.10%	6.19%	6.26%	6.48%
Excess Return	-4.43%	3.40%	4.52%	4.96%	5.87%

The policy benchmark for the private investment portfolio is the Going Concern Discount rate. The 2019 rate is 6.1%, 2018 is 6.2%, 2017 is 6.4%, 2016 is 6.5%, 2015 is 6.55%, 2014 is 6.5%, 2013 is 6.25%, 2007-2012 is 6.75% and prior to 2007 is 7.4% respectively.



Liquidity

	Estimated 2020 Amounts (\$ mln)
Contributions**	\$ 103.4
Dividend & Distribution Income**	\$ 16.8
Interest Income**	\$ 15.1
Other Income**	\$ 0.4
Benefit Payments**	-\$ 113.9
Expenses**	-\$ 6.0
Total Annual Net CF	\$ 15.8
Liquid Investments*	\$ 1,475.2
Actual Net Distributions	\$ 39.6
Projected Net Distributions***	\$ 40.0
Actual Net Capital Calls	-\$ 53.0
Projected Net Capital Calls***	-\$ 65.0
Total CF + Liquid Investments + Private Sales – Capital Calls	\$ 1,452.6

* Liquid investments as at August 18, 2020. Includes all publicly traded equity and fixed income investments

** Contributions, Benefit Payments, Income, and expense estimates based on actual amounts from January to June 2020, annualized for full year

***Since the dynamics we modeled out in March where capital calls speed up and distributions dry up have not materialized, we have reverted to our old methodology to project distributions and capital calls on a straight line basis

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: Cathie O'Toole
Digitally signed by Cathie O'Toole
Date: 2020.11.20 10:29:07 -04'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: November 20, 2020

SUBJECT: COVID-19 Business Impacts

INFORMATION REPORT

ORIGIN

Enterprise Risk Management

BACKGROUND

On March 24, 2020, the Medical Officer of Health, under the authority of the *Health Protection Act*, 2004, c. 4, s.1, s.32 issued an order relating to the pandemic, with various amendments from time to time (Order). Section 11 of the Order exempts "Municipal Utilities such [as] water, wastewater and storm water" from certain restrictions contained in the Order. The operations of Halifax Water are deemed to be an essential service during the continuation of the state of emergency. This Order, as it relates to municipal water and wastewater utilities, remains in place.

Halifax Water has generally maintained its level of service related to the provision of water and wastewater throughout the state of emergency.

DISCUSSION

Halifax Water took immediate action in response to the pandemic. On April 1, 2020 Halifax Water announced measures to assist customers by suspending collection activities, re-connecting disconnected customers, waiving interest during the state of emergency, and offering flexible payment arrangements. With these measures in place, the utility then focused on determining what else could be done to support customers, and the local economy.

As a provider of an essential service, Halifax Water's focus throughout the response to COVID-19 has been to maintain service levels, protect its employees and customers and carry forward with necessary capital work. Halifax Water employs approximately 500 people, with a \$96 million-dollar capital budget and a \$155 million-dollar operating budget for this year. Not only does the utility provide essential services during a time when they are needed the most, but it also provides significant local economic stimulus that that benefits the economy of Halifax which in turn is of benefit to its customers.

On February 10, 2020 Halifax Water filed a two-year rate application with the Nova Scotia Utility and Review Board (NSUARB) for increases in water and wastewater rates. As a result of COVID-19, Halifax Water subsequently modified that request. In August 2020 the NSUARB approved that the utility will maintain the current rates for water service for two years, and for wastewater service this fiscal year. A rate increase for wastewater service is approved for April 1, 2021. This strategy results in less capacity to manage financial risk, particularly with respect to its wastewater service.

Halifax Water does not assume this risk lightly. The pandemic has caused heightened uncertainty. However, two important facts remain consistent:

1. Halifax Water services are essential and will always be required.
2. Many of the costs to provide water and wastewater service are fixed, tied to long term contracts, and based on maintaining and operating assets that are already constructed and in service.

Throughout the response to COVID-19, Halifax Water has not laid off any of its full-time workforce, although two temporary employment contracts were terminated somewhat earlier than expected due to COVID-19. Halifax Water reorganized the way it provides its services. Many employees of Halifax Water are working from home. The field service personnel were divided into two shifts during April and May, so that at any given time, half of the work force was available. In June, field service personnel returned to a more normal work schedule. For the next operational period – January to March 2021 there will be a slight increase in employees working in supervisory and administrative areas to 40% on site, but the majority of CUPE Local 1431 employees will continue to work remotely. These plans are subject to any changes in public health guidelines.



Although exempted from the provisions of the Order, Halifax Water has taken numerous steps to mitigate the risk of its employees being impacted by COVID-19, such as, enhanced cleaning, use of additional personal protective equipment, revised standard operating procedures, limiting gatherings of staff and restricting the number of people in vehicles. The Order does not impact the ability of construction of current capital projects to continue at this time. Those capital projects which were in progress prior to the Order continued. There were some delays with projects that were impacted by changes in HRM's capital budget.

Halifax Water is also continuing necessary planning for future projects required to address its ongoing and continuing infrastructure deficits.

BUDGET IMPLICATIONS

In general, because the essential services provided by Halifax Water continue to be provided to the same standard and service level as prior to the Order, the key budget assumptions regarding expenses have not been impacted by the pandemic.

Halifax Water has been closely tracking the water consumption and has observed changes in consumption patterns for individual customer classes since the advent of COVID-19. Water and wastewater consumption are down 0.80% on a volumetric basis as compared to the previous year. This is mainly due to commercial customers who have had to close offices due to COVID-19. Consumption had been budgeted to remain consistent with the prior year.

Report Prepared by:	Cathie		Digitally signed by Cathie O'Toole
	O'Toole		Date: 2020.11.20 10:29:34 -04'00'
	<hr/>		
	Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager		Digitally signed by Louis de Montbrun
Louis de Montbrun	Date: 2020.11.20 12:16:16 -04'00'		
<hr/>			
Louis de Montbrun, CPA, CA, Director of Corporate Services/CFO			

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the
Halifax Regional Water Commission Board

SUBMITTED BY: *Original signed by:*
Kenda MacKenzie, P.Eng., Director of Environmental Services

APPROVED BY: Cathie O'Toole
Digitally signed by Cathie O'Toole
Date: 2020.11.20 16:17:46 -04'00'
Cathie O'Toole, MBA, CPA, CGA, ICD.D, General Manager

DATE: November 19, 2020

SUBJECT: **RDC Application Update & Decision Summary**

INFORMATION REPORT

ORIGIN

Halifax Water Board Report – Item #2 October 31, 2019

BACKGROUND

The Halifax Regional Water Commission (Halifax Water or Utility) applied to the Nova Scotia Utility and Review Board on November 21, 2019, for approval of a revised RDC for water and wastewater infrastructure and for approval of corresponding amendments to its Schedule of Rates, Rules and Regulations for Water, Wastewater and Stormwater Services (RDC Rules and Regulations). The application requested that the proposed changes become effective on or after April 30, 2020.

The hearing process was delayed as a result of COVID-19, and the Decision was received on October 29, 2020. Halifax Water was directed to complete a Compliance Filing by November 30th, but has requested, and was granted, an extension to December 7th given the complexity of some of the requested tasks required for the Compliance Filing.

DISCUSSION

The October 29, 2020 NSUARB Decision approved revised Water and Wastewater Regional Development Charges, with some adjustments. It is anticipated that the adjustments requested will increase the Regional Development Charges for both Water and Wastewater compared to what was reflected in the submitted in the Rebuttal Evidence filed by Halifax Water and discussed during the Hearing. The resulting RDC charges will mean that a larger portion of future capital costs will be recovered through development related charges. The Decision does direct Halifax Water to do some additional stakeholder engagement on a few specific topics in future, and to provide annual progress reports to the NSUARB.

The summary of the NSUARB findings in the Decision is attached.

Affordable Housing

On October 31, 2019, the Halifax Water Board indicated their support for a proposed change to the Halifax Water Regulations in support of affordable housing development. The RDC Application requested the ability to defer collection of RDCs for up to ten years for units considered within Housing Affordability initiatives as defined by Halifax Regional Municipality. It was proposed interest would be waived for the first two years, and that the municipality would place a lien on the Property to secure future payment of the RDC.

The NSUARB released the Decision on October 9, 2020 and the initial interpretation of the Decision by the media (and by Halifax Water) was that it did not approve Halifax Water's proposal to defer RDCs for affordable housing units.

Clarification was sought from the NSUARB regarding this issue, and they have indicated that the requested change had been approved. Halifax Water will be submitting a compliance filing on December 7th, and expects an Order will be received approving the changes to the Regulations in early in January, meaning the effective date of changes will be early in 2021.

The Decision does give clear direction in paragraphs [192 – 194] that all customers who receive a similar service from Halifax Water must be charged the same rate, therefore a reduced RDC for affordable housing developments would be inappropriate.

Halifax Water looks forward to working with the municipality to implement the deferral program in 2021.

BUDGET IMPLICATIONS

The approval of the adjusted RDCs will have a positive impact on future operating budgets and rates as a higher portion of the required expenditures will be funded through development charges, rather than other forms of capital financing through water and wastewater rates. The precise impact will not be known until the adjustments required by the Compliance Filing have been completed, and the resulting charges are approved.

ALTERNATIVES

N/A

ATTACHMENT

Summary of Findings

Financial Reviewed by:	<div style="display: flex; align-items: center;"><div style="margin-right: 10px;">Louis de Montbrun</div><div style="border-top: 1px solid black; padding-top: 5px;"><div style="font-size: 0.8em; margin-bottom: 5px;">Digitally signed by Louis de Montbrun Date: 2020.11.20 15:41:17 -04'00'</div><div style="margin-top: 5px;">Louis de Montbrun, CPA, CA Director, Corporate Services/CFO, 902-490-3685</div></div></div>
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Q. Thank you. Next I'd like to ask you about the 15 percent variance threshold. Ms. MacKenzie, in accordance with the provisions of the rules and regulations governing the RDC, is Halifax Water prepared to commit to review the RDC on an annual basis to determine whether new data impacts the RDC by plus or minus percent, and where that threshold is triggered, to pursue an update of the RDC?

A. (MacKenzie) Yes, Halifax Water is prepared to do that.

[Transcript, June 11, 2020, p. 40]

The Consumer Advocate anticipates that this annual review will help ensure the RDC is updated on a timely basis where the 15% variance threshold is triggered. The Consumer Advocate submits that these annual reviews should be filed with the Board, with the opportunity for stakeholders to comment on the same.

[Exhibit H-45, p. 5]

Findings

[252] The requirement of the above noted five-year review and interim reviews of the RDC remain unchanged in the Halifax Water Rules and Regulations. The Board reiterates the importance of such reviews, and the need to seek an immediate change to the RDC rate if the review results in a change in excess of $\pm 15\%$. This is important not only to avoid the potential for rate shock, but also to ensure such extra costs (or reduced costs) are allocated fairly between different generations of developers.

[253] As noted above, Halifax Water committed at the hearing, and its Rebuttal Submission, that it would review the RDCs on an annual basis and file an annual report with the Board for comment by stakeholders. The Board so directs.

5.0 CONCLUSION AND COMPLIANCE FILING

[254] The Board approves the revised water and wastewater RDCs, subject to the findings and directives outlined in this Decision. The related amendments to the Schedule of Rates, Rules and Regulations are also approved.

[255] The Board directs Halifax Water to file a Compliance Filing which reflects the following findings:


- a) To include a portion of the estimated costs for the Harbour Solutions WWTFs secondary treatment upgrades in the RDC calculation, with an allocation to growth as calculated by the methodology suggested by Brown and Goldstein in their response to Halifax Water's IR-3. Halifax Water shall provide the calculations used to determine the allocation to growth with its Compliance Filing. If Halifax Water believes that there is insufficient data available to use the methodology suggested by Brown and Goldstein, the Utility's Compliance Filing shall:
 - identify what data is unavailable and why it cannot be readily obtained;
 - propose and describe an alternate methodology for allocating the Harbour Solutions WWTFs secondary treatment upgrade costs to growth; and
 - use the alternate methodology to allocate the Harbour Solutions WWTFs secondary treatment upgrade costs to growth, and use these costs in the RDC calculation;
- b) To include the estimated costs for the Port Wallace Water Transmission Main in the RDC calculation, with a percentage allocation to growth as determined by Halifax Water. Halifax Water shall provide the rationale used to determine the allocation to growth within its Compliance Filing;

- c) To use the ratio of 26% single-unit dwellings (SUDs) to 74% multi-unit dwellings (MUDs) in its RDC calculation;
- d) To calculate revised water and wastewater ICI RDC rates (on a \$/sq.ft. basis) based on the blended FSW of 781 sq.ft./employee;
- e) to allocate the RDC costs between residential and ICI development on the basis of Scenario #4 in Undertaking U-16; and
- f) To revise the Schedules of Rates, Rules and Regulations to incorporate the above changes to the RDC rates and the other amendments to the Rules and Regulations for Water, Wastewater and Stormwater Services.

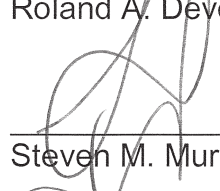
[256] Halifax Water is directed to file its Compliance Filing no later than November 30, 2020. The intervenors are to provide comments, if any, within two weeks of the Compliance Filing, with a rebuttal by Halifax Water within one week.

[257] An Order will issue following the Compliance Filing and submissions.

DATED at Halifax, Nova Scotia, this 29th day of October, 2020.



Roland A. Deveau



Steven M. Murphy



Jennifer L. Nicholson

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun
Digitally signed by Louis de Montbrun
Date: 2020.11.20 16:16:53 -04'00'

Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

APPROVED: Cathie O'Toole
Digitally signed by Cathie O'Toole
Date: 2020.11.20 16:14:50 -04'00'

Cathie O'Toole, MBA, CPA, CGA, ICD.D
General Manager

DATE: November 17, 2020

SUBJECT: 2020/21 Cost Containment Initiatives

INFORMATION REPORT

ORIGIN

- The Cost Containment Process as approved by the Halifax Regional Water Commission (HRWC) Board, October 3, 2013.
- April 14, 2015, Nova Scotia Utility and Review Board (NSUARB) Decision - HRWC General Rate Application (M06540).

BACKGROUND

The process for cost containment as approved by the HRWC Board on October 3, 2013, called for the implementation of a number of recommended actions that would assist HRWC in addressing the Nova Scotia Utility and Review Board's (NSUARB) request for a more rigorous approach to cost containment. One key recommendation was the establishment of a reporting structure whereby, *"on a quarterly basis, the monthly financial report of the HRWC Board will also include an update on Cost Containment Initiatives"*.

In the Decision on the 2015 Rate Hearing, the NSUARB directed HRWC to file annual reports on its efforts to contain operating costs of the utility, with this report to be filed no later than June 30 of each year.

DISCUSSION

A Summary Report - Cost Containment Initiatives for 2020/21 is attached, with updated information as at November 13, 2020. This report shows the cost containment initiatives effecting

operations for 2020/21 as a result of new initiatives implemented during the year and ongoing initiatives from fiscal years 2013/14 to 2019/20 inclusive. The inclusion of initiatives and amounts from prior years reflects an intentional focus on sustainable results over the long term. Estimated cost savings for 2020/21 are \$6.8 million as outlined by category in Figure #1 below:

Figure #1

Procurement Strategies	\$1,018,196	14.9%
Human Resource Strategies	\$3,564,530	52.2%
Information Technology Strategies	\$108,700	1.6%
Facilities/Process Strategies	\$1,993,130	29.2%
Reduce Paper and Printing Costs	\$38,415	0.6%
Technology and Business Process Chang	\$112,138	1.6%
	<u>\$6,835,110</u>	<u>100.0%</u>

As shown above, cost containment initiatives are impacted most in the areas of Human Resource, and Facilities/Process and Procurement Strategies. Under Human Resource Strategies, the effects of pension plan re-design initiated in 2015/16 is one of the main contributors to cost containment savings in the current year. Annual savings related to pension plan re-design approximates \$1.7 million, which represents 48% of the savings within Human Resource Strategies and 25% of the total projected cost savings for 2020/21. In addition, effective January 1, 2019, special payments made by the HRWC to fund the unfunded liability of the pension plan were eliminated resulting in cost savings of \$0.8 million annually. Prior to January 1, 2016, special payments to fund the unfunded liability of the pension plan were approximately \$3.0 million. The next actuarial valuation is required on or before January 1, 2022.

Facilities/Process Strategies contain initiatives of varying nature, however one of the main contributors in this category is Halifax Water's Energy Efficiency Program. Projects under this Program account for approximately \$1.0 million of projected savings for the current year, representing 52% of savings within the category and 15% of the total projected savings for 2020/21. Some of the prominent initiatives under the program related to energy savings include the annual shutdown of the ultraviolet disinfection systems (\$0.2 million), heat recovery processes (\$0.1 million) and lighting upgrades at various facilities.

Through Procurement Strategies, staff continue to negotiate the best pricing for products and services enabling the utility to operate in an efficient manner.

New cost containment initiatives implemented thus far during the 2020/21 fiscal year result in projected cost savings of approximating \$0.2 million and are highlighted for ease of reference on the Summary Report - Cost Containment Initiatives attached.

As part of the recent 2020 Rate Application to the NSUARB, Halifax Water committed to generating savings of approximately \$1.7 million associated with operating expenses during

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2020/21. Figure #2 below reports projected savings for the expenditures targeted in the Rate Application, based on most recent forecasts to November 2, 2020.

Figure #2

	2020/21		Variance	
	Budget	Forecast	\$	%
Targeted expenditures:				
Operating expenditures				
Salaries/wages	\$ 32,333,000	\$ 31,789,000	\$ (544,000)	(1.7%)
Training and development	1,318,000	862,000	(456,000)	(52.9%)
Contract services	6,002,000	5,451,000	(551,000)	(10.1%)
Materials and supplies	2,281,000	2,240,000	(41,000)	(1.8%)
Fleet	3,902,000	3,681,000	(221,000)	(6.0%)
	45,836,000	44,023,000	(1,813,000)	(4.1%)
Financial expenditures				
Debt servicing	30,930,000	28,340,000	(2,590,000)	(9.1%)
Total	\$ 76,766,000	\$ 72,363,000	\$ (4,403,000)	(6.1%)

BUDGET IMPLICATIONS

Available information on cost containment initiatives were taken into consideration in developing the 2020/21. Initiatives that impact future fiscal periods will be incorporated into budget cycles and processes of these future periods.

ATTACHMENT

Summary Report – Cost Containment Initiatives

Report Prepared by: ***Original signed by:***

Allan Campbell, B. Comm, CPA, CMA
Manager, Finance, (902) 490-4288

18-Nov-20

#	Initiative	Comments	Year Initiated	2020/21 Cost Savings
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1 General Budget Strategies

Sub-total \$0

2 Procurement Strategies

Insurance adjustment services - sole source relationship over a 10 year period	Halifax Water (HW) participated in a joint tender with Halifax Regional Municipality(HRM). Costs will be approximately 20% lower.	2013/14	\$5,460
Standardized uniforms and clothing	Issuance of a bulk tender; centralization of purchasing and distribution function; possible policy change to "as required" rather than a quota system	2013/14	\$20,000
Standardized boots	Issuance of a bulk tender; centralization of purchasing and distribution function; possible policy change to "as required" rather than a quota system	2013/14	\$5,000
Mobile devices - switched supplier and carrier	HW participated in a joint tender with HRM	2013/14	\$51,624
Customer account collections	Coordination of collection services related to closed customer accounts in conjunction with the Provincial Public Procurement Act, rather than outsourcing to private organizations	2014/15	\$10,000
Lab Testing	Savings as a result of contract tendering	2013/14	\$60,000
NSPI rate reclassification	Eastern Passage Wastewater Treatment Facility (WWTF)	2014/15	\$16,000
NSPI rate reclassification	Duffus Street Pumping Station	2015/16	\$15,000
Chemical purchasing	Able to purchase a corrosion inhibitor with a higher concentration of active ingredient, thus foregoing additional costs that would have resulted under current dosage requirements	2015/16	\$400,000
Replacement of wireless headsets for Customer Care staff	Wireless headsets were not performing as expected, therefore a switch was made to wired headsets which resulted in savings on a per unit cost basis, and also savings regarding the frequency and cost of replacement associated with the wired headsets.	2015/16	\$1,500
Mobile devices - switched supplier and carrier	HW leveraged the mobility contract of the Province of Nova Scotia	2016/17	\$48,000
Garbage collection - JD Kline Plant	A request for proposal (RFP) was put out to consolidate the garbage collection, which resulted in a cost savings with respect to internal man-hours and use of HW	2016/17	\$1,370
Utilizing HW staff to setup excavations sites	Using trained HW staff as TWS for job sites, unless outside traffic control personal are required	2016/17	\$50,000
RFP for biosolids transport	As a result of a recent RFP, the is expected to be an approximate 33% cost reduction related to transporting biosolids from the Halifax, Dartmouth, Herring Cove and Eastern Passage WWTF	2017/18	\$220,000
Traffic control	Using trained HW staff for the purposes of traffic control while working on HW excavations sites will result in cost savings of \$750/day. This is based on an 8 hour day, including setup costs typically paid to the contractor.	2017/18	\$50,000
Insourcing (Halifax Water's Annual Report)	The ability to perform in-house graphic design work versus contracting this work outside created savings with respect to the 2018 report of approximately \$100/page. Recurring annual savings will fluxuate depending on the size of the report in subsequent years.	2018/19	\$9,200
Equipment calibration	Internal staff are now able to calibrate fixed gas detectors instead of outsourcing this to a MSA technician service provider.	2019/20	\$3,000
Reduction in sampling	Reduced the amount of lab testing over the year as greater reliance and confidence was placed on the new, in-line analyzers.	2019/20	\$5,000

Implementation of the new telephony platform	With the implementation of the new telephony platform, Customer Care was able to transition from the use of landlines.	2020/21	\$45,000
Discounted parts offerings from a vendor	As a result of supply/demand, a vendor was offering significant savings (40%) toward the purchase of Rotork actuators. This was a limited time offer, good until November 30, 2020. As a result, the Mill Cove WWTF was in need of an actuator and was able to take advantage of the offering.	2020/21	\$2,043

Sub-total \$1,018,197

3 Human Resource Strategies

Heavy Truck and Equipment Service	the addition of a new Heavy Equipment Technician provides in-house maintenance service capabilities for the HW fleet.	2013/14	\$100,000
Beeper Pay	Elimination of an inconsistency between Water and Wastewater Services, as Water Services staff do not receive beeper pay. This involves 10 non-union staff in total.	2013/14	\$75,000
Accessing on-line training opportunities	More use of on-line training versus the traditional methods, including WHMIS and TDG renewals	2014/15	\$2,241

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Background Checks	Out-sourced background checks to a new contractor.	2015/16	\$654
Workload, labor force assessment	A reduction in number of staff in Development Approvals. The volume of work did not warrant 6 planning technologists, and as a result this number has been reduced to 4.	2015/16	\$140,000
Pension plan re-design	Through the collective bargaining process, HW was able to negotiate pension plan re-design to make the plan more sustainable. It is estimated the employer's share contributions will decrease from the current 12.95% to 9.85% effective January 1, 2015.	2015/16	\$1,700,000
Re-structuring within the organization to create a new "Corporate Services" sector	January 1, 2016 saw the elimination of two (2) full time positions and a re-design of several other jobs.	2015/16	\$35,000
Workload, labor force assessment	January 1, 2016 saw the elimination the administrative assistant within Regulatory Services.	2015/16	\$57,000
Workload, labor force assessment	November, 2016 saw the elimination of a Compliance Sampling position as a result of a reduction in sampling requirements.	2016/17	\$81,966
Overtime reductions	Overtime has been reduced at the Harbour Solutions Plants with respect to sick leaves, vacation, etc. when weather conditions allow and operational needs are met. Also, Halifax WWTF staff are responding to after hours calls at the Dartmouth and Herring Cove facilities in an effort to minimize the need for overtime call-outs.	2016/17	\$40,000
Change in benefit provider	The selection of a new benefit provider for life and long term disability (LTD) resulted in significant cost savings over the next three (3) years...2018-2021	2017/18	\$125,000
Actuarial Valuation - January 1, 2019	The actuarial valuation performed January 1, 2019 reported a surplus for the pension plan. As a result, special payments by Halifax Water to fund the unfunded liability are no longer required for at least 3 years when the next valuation is to be performed..	2018/19	\$825,200
Modifications to the Pre-Retirement Leave Program	In June 2019, employees were given the opportunity to withdraw their accrued benefit under the Pre-Retirement Leave Program in the form of a lump-sum payment, rather than continuing to accrue a benefit under a modified program. The Pre-Retirement Leave Program had been closed to new, non-union employees hired after March 31, 2018, and is now effectively closed for all other employees hired after June 7, 2018.	2019/20	\$260,000
Elimination of "Option 1" mileage reimbursement	Halifax Water previously offered two options to employees for the reimbursement mileage travelled while conducting business on behalf of the utility. Upon manager approval, "Option 1" reimbursed employees traveling in excess of 1,200 kilometers per year at a rate of \$0.24/kilometer, plus a monthly allowance of \$215, "Option 2" reimbursed employees at a rate of \$0.52/kilometer up to 5,000 kilometers, and at \$0.46/kilometer thereafter. Option 1 was eliminated May 15, 2020.	2020/21	\$33,469
Shortened employment terms	The employment terms of 2 employees were shortened by 6 months in the Metering/Billing department as a result of modified work during the pandemic.	2020/21	\$89,000
Sub-total			<u>\$3,564,530</u>

4 Information Technology Strategies

Xerox managed print solutions	Rationalization and replacement of photocopiers and printers	2013/14	\$20,000
Network	Change in cost model by Eastlink, giving HW the new pricing	2013/14	\$80,000
Telephone land lines	Rationalization of services and eliminate duplication of resources as required	2013/14	\$8,700
Sub-total			<u>\$108,700</u>

5 Facilities/Process Strategies

Chlorine Utilization - Pockwock	Discontinuation of the pre-chlorination process	2013/14	\$40,000
Lab Testing	Price benefits from purchasing product from a different source mainly affecting the Harbour Solution Plants	2013/14	\$105,000
Pumper Truck Utilization	pilot project to be scheduled initially for stormwater customers only as a test	2013/14	\$130,000
Waste oil boiler system - Herring Cove WWTF	new system to allow the use of waste oil from Metro Transit as an alternative heating source	2014/15	\$13,250
System sampling for HPC's	sampling was reduced from weekly to monthly	2014/15	\$8,025
NSE system assessments	Assessment reports are being completed in-house rather than being outsourced	2014/15	\$25,000
Decommissioning of the Bedford South pumping station	The developer driven system expansion will permit the use of gravity and pressure reduction rather than the pumping station	2014/15	\$15,000
Lighting upgrades - Bennery Lake WSP		2014/15	\$4,793
Insulation upgrades - Bennery Lake WSP		2014/15	\$36,000
Lighting upgrades - Eastern Passage WWTF		2014/15	\$7,880
Lighting upgrades - Dartmouth WWTF		2014/15	\$22,542
Lighting upgrades - Herring Cove WWTF		2014/15	\$13,744

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Lighting upgrades - Halifax WWTF		2014/15	\$29,845
Lighting upgrades - Aerotech BPF		2014/15	\$19,109
HVAC upgrades - Eastern Passage WWTF		2014/15	\$20,711
HVAC upgrades - Roach's Pond pumping station		2014/15	\$13,500
MCC 190 cooling and heat recovery - Halifax WWTF		2014/15	\$13,164
Aeration system upgrades - Eastern Passage WWTF		2014/15	\$76,382
Orchard Park in-line turbine project		2014/15	\$31,494
Wind farm - Pockwock WSP		2014/15	\$130,399
Biogas CHP system - Mill Cove		2014/15	\$86,000
Disposal of water treatment plant solid residual material	A new location for the disposal of the residual material was found	2014/15	\$36,000
Advanced investigative tool for leaks and structural condition of pipes	The current program has been halted as a cost containment initiative and as a result of the information received.	2014/15	\$150,000
E-delivery	Transitioning from traditional billing methods to e-delivery	2014/15	\$20,000
Change in Recycling Pickups	By changing the schedule for recycling pickups from bi-weekly to every three (3) weeks, the anticipated annual savings will range from \$2,500 to \$2,700.	2015/16	\$2,700
Highway #7 Booster Station Upgrade	Expected energy savings	2015/16	\$14,300
Dartmouth WWTF - UV Channel Isolation	Expected energy savings	2015/16	\$59,460
Halifax WWTF - Fixed Compressed Air Leaks	Expected energy savings	2015/16	\$2,293
Halifax WWTF - UV Channel Isolation	Expected energy savings	2015/16	\$62,115
Herring Cove WWTF - MCC 190 Cooling/Heat Recovery	Expected energy savings	2015/16	\$8,496
Herring Cove WWTF - Ventilation Air Heat Recovery	Expected energy savings	2015/16	\$18,755
Sampling	Using internal staff at the Mill Cove facility to perform the required daily sampling at the facility, rather than the compliance staff, limiting their site visits to once a week.	2015/16	\$4,160
Staff utilization	Using trained HW staff for traffic control on HW job sites unless contractors are required.	2015/16	\$50,000
Process alternative	A centrifuge was rented for the Mill Cove WWTF (with the option to purchase) on a trial basis to dewater liquid sludge that typically would be transported to the Aerotech WWTF. The transport of the liquid sludge resulted overtime costs, as well as reducing the time available for HW truck to service other facilities. This process assisted the Aerotech in reaching its compliance goals and reduced overtime costs by an estimated 50%. This equipment will enable HW proceed with a digester clean out project, which would otherwise be sub-contracted at a cost of \$200,000.	2015/16	\$40,000
Process change	It was decided that flanges for meter sizes greater than 2" would be the responsibility of the customer, since when meters are replaced, the flanges are not replaced.	2015/16	\$4,854
UV disinfection shutdown - HHSP and Eastern Passage WWTFs	Annual shutdown of UV disinfection system resulted in cost savings associated with electrical energy savings, peak demand reduction,	2016/17	\$193,540
Halifax WWTF - Ventilation Air Heat Recovery System	Implemented October, 2016	2016/17	\$42,069
Halifax WWTF - Carbon Scrubber By-Pass	Implemented April, 2016	2016/17	\$38,405
Tools developed internally	Tools developed internally to install new operating nuts on buried valves. Previously nuts were lost on buried valves resulting in a need to excavate the valve and install new nuts. Cost savings are achieved regarding excavation and reinstatement.	2016/17	\$20,000
Spruce Hill transmission main	Two long term leaks were discovered in the transmission main resulting in cost savings from the perspective of water loss control.	2016/17	\$3,000
Utilization of industrial water	A new filter system was installed at the Eastern Passage WWTF that provides the capability to use the current industrial water system rather than potable water to deliver water to the polymer feed systems.	2016/17	\$26,000
Cost reductions (material transport)	Modifications to the screening/grit skip eliminated the need to purchase 2 new screening compactors, which also resulted in the amount of material transported of approximately 28 metric tonnes.	2017/18	\$2,000
Herring Cove WWTF - Carbon Scrubber By-Pass	Implemented April, 2017	2017/18	\$9,378
Dartmouth WWTF - Ventilation Air Heat recovery	Expected energy savings - Implemented March, 2018	2017/18	\$56,092
Servicing oxygen monitors in-house	Technical Service staff have been trained by the manufacturer to service the fleet of personal gas monitors in-house, specifically the replacement of the oxygen sensor. These monitors, 165 in total, are used by all operation and treatment departments throughout the organization.	2018/19	\$30,000

Pumping Station Starters (4160V)	The pumping station starters were upgraded to vacuum starters, thus eliminating the need for annual servicing of the starters to be outsourced. Any maintenance can now be handled by in-house industrial electricians.	2018/19	\$1,500
Automated Flushing Stations	Automated flushing stations are now used to ensure the proper chorine residuals are achieved in all areas of the transmission and distribution system. Previously this operation was performed manually on a daily basis from approximately June to September. As a result labor and vehicle costs have been reduced accordingly.	2018/19	\$8,000
Corrosion Sampling	Corrosion sampling in the distribution system was reduced from bi-weekly to monthly in June, 2018, since enough baseline data has been collected and there are no immediate plans to change corrosion control in the near future.	2018/19	\$12,600
Alternative product	An alternative timing belt was introduced to replace the normal v-belt/sheave configuration, which reduced slippage between the v-belts and sheaves resulting in a reduction in power demand. The product has been installed at both the Halifax and Herring Cove WWTF, with the expectation of implementation at other wastewater and water facilities.	2018/19	\$40,000
Dosage Optimization	Desiccant filters were fitted to the polymer totes to prevent warm, moist air from contaminating the polymer dosed to thicken centrifuge and drum thickener solids. The polymer no longer reacts early with water before being dosed, thus allowing the optimization of the dose and preventing polymer waste, leading to reduced consumption.	2019/20	\$20,000
Alternative product	The HP biofilter exhaust fan motor belts will be replaced with syncrodrive timing belts, saving energy (electricity) through the prevention of slippage. Belts and sheaves have been purchased and will be installed in October, 2019.	2019/20	\$4,500
Building maintenance	Installed new weather stripping in the overhead door in the truck bay at the AeroTech plant to reduce heating costs	2019/20	\$1,500
Polymer optimization	Began polymer optimization in an effort to ensure good quality biosolids as well as a good quality centrate without having excess amounts of polymer. Were able to reduce the feed rate from 60% to 21%.	2019/20	\$15,000
Improvements to aeration train	Installed a curtain in the aeration train to enable better mixing of the microorganisms with the chemical, thereby reducing chemical costs and providing better quality treatment.	2019/20	\$15,000
Optimization of polymer dosing (Mill Cove)	By implementing daily jar testing to determine the startup dose setpoint, polymer dosing was optimized.	2019/20	\$14,000
Belt drive change-out (Mill Cove)	Replacing the belt drive with a synchronous chain drive on a 30 horsepower blower resulted in a cost savings associated with energy consumption.	2019/20	\$1,275
Upgrading equipment (Mill Cove)	Upgrading the water flow meter used in the dilution of polymer resulted in lowering water usage in the process by approximately 20,000 litres per day.	2019/20	\$12,000
Fan belt/ pulley replacements - Mill Cove WWTF	Expected energy savings - based on 12,750 kWh	2019/20	\$1,300
Fan belt/ pulley replacements - Dartmouth WWTF	Expected energy savings - based on 177,980 kWh	2019/20	\$20,000
Sludge removal	The off-site removal of sludge for the Lake Major water supply plant has been deferred until 2021/22, allowing the sludge to be drier and have less weight, thus reducing the financial impact on the 2020/21 fiscal year.	2020/21	\$80,000
Reduction in landscaping initiatives	Landscaping initiatives were reduced at the Lake Major water supply plant in an effort to reduce the financial impact on the 2020/21 fiscal year.	2020/21	\$1,000
Preventative maintenance program established	A preventative maintenance program was created in conjunction with HW operations staff to clean centrifuge centrate lines weekly at a cost of \$235. Clogging of centrate in the centrate lines were being experienced resulting in a backup in the centrifuge drum and bio-solids bin. Every 2-3 weeks it was costing approximately \$1,000 to remove obstructions by an outside contractor, in addition to internal staff time and equipment.	2020/21	\$10,000
Sub-total			\$1,993,130

6 Reduce Paper and Printing Costs

Electronic HRWC Board Packages	Send Board packages out electronically rather than issuing hard copies	2013/14	\$7,500
Paperless Office within the HR Department	Creating electronic workflow	2013/14	\$4,804
Stewardship Report	The Stewardship Report will be published electronically only, with no hard copies	2013/14	\$3,000
Changes to document archiving	Transitioning file storage from outside contractor to public resources	2013/14	\$3,175
Changes to document archiving	Transitioning file storage from outside contractor to public resources	2016/17	\$9,000
Cost reduction associated with off-site storage	There has been an effort to reduce the number of boxes (documents) stored in facilities such as Iron Mountain, by sorting and purging documents in accordance with the document retention policy of the Commission.	2018/19	\$10,000

Halifax Water
Summary Report - Cost Containment Initiatives
2020/2021
Fiscal Year

ITEM #9-I
 HRWC Board
 November 26, 2020
 ATTACHMENT

Cost reduction associated with the 23rd Annual Report (General Manager's office)	The annual report for the year ended March 31, 2019 saw the number of copies produced drop from 275 copies in the previous year to 150 copies. This represents not only a cost savings but also an environmental benefit associated with paper reduction.	2019/20	\$936
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Sub-total			<u>\$38,415</u>
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7 Technology and Business Process Changes

Workload, labor force assessment	Through the utilization of technology, such as a Customer Relationship Management (CRM) system, a budgeted addition (customer service representative) has been removed.	2015/16	\$47,605
Workload, labor force assessment	Re-structuring by management within the advanced metering infrastructure (AMI) project as a result of technological efficiencies anticipated.	2015/16	\$64,533

Sub-total			<u>\$112,138</u>
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\$6,835,110