Appendix D: Cost Estimate



Opinion of Probable Cost Summary (2013 dollars and no escalation provided)

Navy and Water St WWPS & Collection System Modernization Feasibility Study

11-03-14

Description		CAD \$
General Requirements	\$	294
Percentage of Capital Equipment (excludes collection system)	\$	714
Replacement of Navy St. PS	\$	1,089
Improvements to Water St. PS	\$	63
Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	\$	1,015
Subtotal Capital Facility (A)	\$	3,176
Overhead & Profit (10% of A)	\$	317
MOB/Bond/Insurance (5% of A)	\$	158
Construction Contingency (20% of A)	\$	635
Construction Sequencing Allowance (3% of A)	\$	95
Subtotal Construction (E)	\$	4,384
Engineering Design (15% of E) - includes EA, destailed design and contr admin	\$	657
Halton Internal Costs (10% of E)	\$	438
Project Overall Contingency (10% of E)	\$	438
Mid-Year Point of Construction	\$	88
Capital Cost Alternative 1	\$	6,006
Whole Life Cost Alternative 1	\$	13,483
NPV Alternative 1	\$	11,229
Alternative 2: Eliminate Navy St. Pumping Station and Divert Total Flows to Water St	. PS	
General Requirements	\$	536
Percentage of Capital Equipment (excludes collection system)	\$	718
Demolition of Navy St PS	\$	185
Replacement of Water St. PS	\$	1,075
Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	\$	2,690
Subtotal Capital Facility (A)		5,204
Overhead & Profit (10% of A)	\$	520
MOB/Bond/Insurance (5% of A)	\$	260
Construction Contingency (20% of A)	\$	1,040
Construction Sequencing Allowance (3% of A)	\$	156
Subtotal Construction (E)	\$	7,182
Engineering Design (15% of E) - includes EA, destailed design and contr admin	\$	1,077
Internal Halton Costs (10% of E)	\$	718
Project Overall Contingency (10% of E)	\$	718
Mid-Year Point of Construction	Ś	144
Capital Alternative 2		9,840
Whole Life Cost Alternative 2		12,230
NPV Alternative 2		11,003
rnative 3: Navy St. Remains Operational at Current Capacity and Divert Partial Flows to V General Requirements Percentage of Capital Equipment (excludes collection system)	Vate \$ \$	er St. P 262 339
Improvements to Navy St PS	\$	313
Improvements to Water St. PS	\$	127
Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	\$	1,489
Subtotal Capital Facility (A)	\$	2,532
Overhead & Profit (10% of A)	\$	253
MOB/Bond/Insurance (5% of A)	\$	126
Contingency (20% of A)	\$	506
	\$	75
Construction Sequencing Allowance (3% of A)	\$	3,495
Construction Sequencing Allowance (3% of A) Subtotal Construction (E)	, \$	524 524
Subtotal Construction (E)	· •	349
Subtotal Construction (E) Engineering Design (15% of E) - includes EA, destailed design and contr admin		
Subtotal Construction (E) Engineering Design (15% of E) - includes EA, destailed design and contr admin Internal Halton Costs (10% of E)	\$	
Subtotal Construction (E) Engineering Design (15% of E) - includes EA, destailed design and contr admin Internal Halton Costs (10% of E) Project Overall Contingency (10% of E)	\$ \$	349
Subtotal Construction (E) Engineering Design (15% of E) - includes EA, destailed design and contr admin Internal Halton Costs (10% of E) Project Overall Contingency (10% of E) Mid-Year Point of Construction	\$ \$ \$	349 70
Subtotal Construction (E) Engineering Design (15% of E) - includes EA, destailed design and contr admin Internal Halton Costs (10% of E) Project Overall Contingency (10% of E)	\$ \$ \$	349

BUDGET COST ESTIMATE

	Modernization Feasibility Study								
	Alternative 1: Navy St. Pumping Station i Operatio		aded to F Current (bacity and N	Water St. PS	Remains	
	red by: C. Collin ct Manager: S. Liver								Black & Veat
	Description	Quantity	Unit	Un	iit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	Conoral Requirements								
	General Requirements Mobilization	1	0/		00/	¢ 40.004	\$-	\$ 43,361	
	Supervision	1	%		2% 6%	\$ 43,361 \$ 130,084	\$-	\$ 130,084	
	Temporary Facilities	1	%		4%	\$ 86,723	\$-	\$ 86,723	
	Temporary Utilities	1	%		1%	\$ 21,681	\$ -	\$ 21,681	
	Equipment Rental	1	%		0.5%	\$ 10,840	\$ 1,626 (15%)	\$ 12,466	
	Sub-total General					\$ 292,690	\$ 1,626	\$ 294,316	
	Percentage of Capital Equipment (excludes collection system)								
-	Sitework		%		10%	\$ 115,240		\$115,240	
	Excavation, shoring and backfill		%		10%	\$ 115,240		\$115,240	
	Yard Piping		%		5%	\$ 57,620		\$57,620	
	Metals		%		2%	\$ 23,048		\$23,048	
	Additional Finishes		%		5%	\$ 57,620		\$57,620	
	Process Piping and Supports		%		5%	\$ 57,620		\$57,620	
	Electrical I&C		%		20%	\$ 230,480			20% for electrica
8	lac.		%		5%	\$ 57,620		\$57,620	ductbank cost
	Subtotal capital facility costs							\$ 714,488	
	Replacement of Navy St. PS Packaged Pumping Station	1	Lump Sum	¢	275 000	\$ 375,000	\$ 93,750 (20%)	\$ 468,750	
			•				\$ 93,750 (20%)		
	Concrete Wetwell	360	m3	\$	1,000	\$ 360,000	• · · · · · · · · · · · · · · · · · · ·	\$ 360,000	
	Genset (250 kW) Demolition of Existing PS	1 1	Lump Sum Lump Sum		96,000 150,000	\$ 96,000 \$ 150,000	\$ 14,400 (15%)	\$ 110,400 \$ 150,000	
						* 004 000	\$ 400 450	* 4 000 450	
	Sub-total Replacement of Navy St. PS Improvements to Water St. PS					\$ 981,000	\$ 108,150	\$ 1,089,150	
	New Cathodic Protection System	1	Lump Sum	\$	10 000	\$ 10,000	\$ 1,500 (15%)	\$ 11,500	
	Genset (100 kW)	1	Lump Sum			\$ 45,000	\$ 6,750 (15%)	\$ 51,750	
		-		Ŧ	,		••••		
	Sub-total Improvements to Water St. PS Collection System (includes site work, excavation, shoring, bac	ckfill, and a	asphalt resto	ratio	on)	\$ 55,000	\$ 8,250	\$ 63,250	
	New 450mm Piping (mixed depth)	60	m	\$, 1,448	\$ 86,861		\$ 86,861	
	MT (shale) along Front, Navy	150	m	\$	4,500	\$ 675,000		\$ 675,000	
	MT construction shafts	3	each		75,000	\$ 225,000		\$ 225,000	
	Manhole	3	unit	\$	6,860	\$ 20,580	\$ 8,232 (40%)	\$ 28,812	
	Sub-total Collection System					\$ 1,007,441	\$ 8,232	\$ 1,015,673	
							, .=		
	Subtotal capital facility costs (A) Overhead & Profit (10% of A)				100/			\$ 3,176,877 \$ 317,688	
	MOB/Bond/Insurance (5% of A)				10% 5%			\$ 158,844	
	Construction Contingency (20% of A)				5% 20%			\$ 635,375	
	Construction Sequencing Allowance (3% of A)				3%			\$ 95,306	
_	Total est. construction costs							\$ 4,384,090	
_									
	Non-Construction costs	contr admi-			450/			667 640	
	Engineering Design (15% of E) - includes EA, destailed design and Halton Internal Costs (10% of E)	contradmin			15% 10%			657,613 438,409	
	Project Overall Contingency (10% of E)				10% 10%			438,409	
					10%			430,409	
_	Total Estimated Capital Costs							\$ 5,918,521	

Note: The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment, including railway crossings and electrical supply modifications or relocations.

Navy and Water St WWPS & Collection System Modernization Feasibility Study

BUDGET COST ESTIMATE

	Alternative 2: Eliminate Navy St. Pum	ping Sta	tion and I	Divert To	tal Flows to	Water St. PS	5	
	ared by: C. Collin sct Manager: S. Liver							Black & Veatc
No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	2%	\$ 79.008	\$-	\$ 79,008	
	Supervision	1	%	6%	\$ 237,025	\$-	\$ 237,025	
	Temporary Facilities	1	%	4%	\$ 158,016	\$ -	\$ 158,016	
	Temporary Utilities	1	%	1%	\$ 39,504	\$-	\$ 39,504	
	Equipment Rental	1	%	0.5%	\$ 19,752	\$ 2,963 (15%)	\$ 22,715	
	Sub-total General				\$ 533,305	\$ 2,963	\$ 536,268	
	Percentage of Capital Equipment (excludes collection system)						* 100 015	
	Sitework		%	10%	\$ 126,015		\$126,015	
	Excavation, shoring and backfill Yard Piping		%	10%	\$ 126,015		\$126,015 \$63,008	
-	Metals		%	5%	\$ 63,008		\$63,008 \$25,203	
	Additional Finishes		%	2%	\$ 25,203		\$25,203 \$63,008	
_	Process Piping and Supports		%	5% 5%	\$ 63,008 \$ 63,008		\$63,008	
	Electrical		%	5% 15%	\$ 63,008 \$ 189,023		\$189,023	
	I&C		%	5%	\$ 63,008		\$63,008	
	Subtotal capital facility costs						\$ 718,286	
	Demolition of Navy St PS						¢ / 10,200	
	Demolition of Existing PS	1	Lump Sum	\$ 150,000	\$ 150,000		\$ 150,000	
	Landscaping	1	Lump Sum	\$ 15,000	\$ 15,000		\$ 15,000	
	Sewage Lift Connection	1	Lump Sum	\$ 20,000	\$ 20,000		\$ 20,000	
	Sub-total Replacement of Navy St. PS				\$ 185,000	\$-	\$ 185,000	
	Replacement of Water St. PS			A 075 000	A 075 000	* • • • = • • • • • • • • • • • • • • • • • • •	A 100 TF 0	
	Packaged Pumping Station	1	Lump Sum	\$ 375,000	\$ 375,000	\$ 93,750 (25%)	\$ 468,750	
	Concrete Wetwell Genset (250 kW)	396 1	m3 Lump Sum	\$ 1,000 \$ 96,000	\$ 396,000 \$ 96,000	\$ 14,400 (15%)	\$ 396,000 \$ 110,400	
	Demolition of Existing PS	1	Lump Sum		\$ 98,000	\$ 14,400 (15%)	\$ 10,400	
	Sub-total Improvements to Water St. PS				\$ 196,000	\$ 14,400	\$ 1,075,150	
	Collection System (includes site work, excavation, shoring, back	fill, and asp	halt restoration	on)	• • • • • • • • •	•••	• .,,	
	New 450mm Piping	450	m	\$ 551	\$ 248,040		\$ 248,040	Shallow pipe.
	New 450mm Piping	90	m	\$ 2,344	\$ 210,974		\$ 210,974	Deep pipe
	New 300mm Forcemain	135	m	\$ 468	\$ 63,180		\$ 63,180	Shallow pipe.
	MT along Front	110	m	\$ 4,500	\$ 495,000		\$ 495,000	Shanow hipe.
	MT along William	90	m	\$ 4,500	\$ 405,000		\$ 405,000	
	MT along Navy	160	m	\$ 4,500	\$ 720,000		\$ 720,000	
	MT construction shafts	5		\$ 4,500 \$ 75,000			\$ 720,000	
			each		\$ 375,000 \$ 115,140			
	New 150mm Piping Manhole	120 6	m unit	\$ 962 \$ 6,860	\$ 115,440 \$ 41,160	\$ 16,464 (40%)	\$ 115,440 \$ 57,624	
	Sub-total Collection System				\$ 2,673,794	\$ 16,464	\$ 2,690,258	
5					φ <u>2</u> ,0:0,10 1	Ψ 10,707		
A	Subtotal capital facility costs (A)						\$ 5,204,962	
В	Overhead & Profit (10% of A)			10%			\$ 520,496	
C	MOB/Bond/Insurance (5% of A)			5%			\$ 260,248	
D	Construction Contingency (20% of A) Construction Sequencing Allowance (3% of A)			20% 3%			\$ 1,040,992 \$ 156,149	
E	Total est. construction costs						\$ 7,182,848	
	New Operation and a (P)							
_	Non-Construction costs (E)	nte nalas la					1 077 407 00	
F	Engineering Design (15% of E) - includes EA, destailed design and co	ontr admin		15%			1,077,427.20	
G H	Internal Halton Costs (10% of E) Project Overall Contingency (10% of E)			10% 10%			718,284.80 718,284.80	
							¢ 0 000 017	
1	Total Estimated Capital Costs						\$ 9,696,845	

Note: The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding. This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment, including railway crossings and electrical supply modifications or relocations.

Vision: Control Quantity Unit Unit Control Comment Comment Mage: Equipment Description Control Contro		Modernization Feasibility Study	BU	IDGET CO	OST	EST	MATE		11-03-14	
Unique Signal Control Outer State Equipment State Equipment State Control		Alternative 3: Navy St. Remains Operational	at Curre	ent Capac	city	and C	ivert Partia	al Flows to	Water St. PS	ò
Model Equipment Description Quantity Unit Unit Cost Total Lost Equipment Figure 1 Total Total Second Requirements Descel Requirements Multization 5 25 5 - 5		•								Black & Veato
Modilation % 2% 5.8.0.20 \$ 5.8.0.00 Supervision % 6% 5.15.800 \$ 5.77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240 \$ \$77.240	No.		Quantity	Unit	Uni	it Cost	Total Cost	Installation (15% unless	Total	Comments
Specification 9 6 5 5 110.800 Sub-total General 1 % 4% \$77.20 \$<		General Requirements								
Spension % 6% 8116,800 5 • \$115,800 Temporary Unlines 1 % 41% \$77,240 \$ • \$10,300 Sub-total General 1 % 0,5% \$10,800 \$ • \$10,300 Sub-total General 2 200,685 \$14.48 \$72,400 \$51,410 \$ \$60,100 Sub-total General 2 200,685 \$14.48 \$22,013 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,100 \$60,200 \$6		Mobilization		%		2%	\$ 38,620	\$	\$ 38,620	
Temporary Utilines 1 % 1% 1% 5,10,310 S - \$19,310 Equipment Remail 1 % 0.5% \$1,448 \$262,133 Sub-total General 2200,885 \$1,448 \$262,133 Percentage of Capital Equipment (excludes collection system) 5 5 5,66,66 \$56,66 Sub-total General % 10% \$44,112 \$44,112 \$44,112 Yard Peing % 10% \$54,4112 \$44,112 \$44,112 Yard Peing % 9% \$22,066 \$22,066 \$22,066 \$22,066 Subtotal capital facility costs % 9% \$22,068 \$22,066 \$22,066 \$22,066 Concret Wetwell Epanation 7% 9% \$22,068 \$22,066 \$22,066 Sub-total Ingrovements to Nay 0 F S 5 5,000 \$10,000 \$10,000 \$10,000 Building services improvements 6 m2 \$400 \$22,000 \$10,000 \$10,000 \$10,000 Sub-t		Supervision				6%		\$ -	• \$ 115,860	
Equipment Rental 1 5, 0.6%, \$ 9,000 \$ 1.448 (15%) \$ 11,103 Subcold Central Concentry of Capital Equipment (accludes collection system) 5 200,085 \$ 1.448 (15%) \$ 202,133 Percentage of Capital Equipment (accludes collection system) 5 5.06,166 366,168 Sthework 5 15%, \$ 66,166 366,188 Additional Finitives % 10%, \$ 444,112 344,112 Additional Finitives % 7%, \$ 22,066 322,066 Process Peing and Supports % 7%, \$ 22,066 322,066 322,066 Subtoal capital facility costs \$ 54,000 \$ 84,000 \$ 1.0280 \$ 11,0280		Temporary Facilities	1	%		4%	\$ 77,240	\$		
Sub-total Equipment (axcludes collection system) Store Store Store Store Store Strooth Store Stor				%		1%	\$ 19,310			
Percentage of Capital Equipment (excludes collection system) 15% 566,168 \$66,168 \$66,168 Excavation, shoring and backfill % 10% \$44,112 \$44,112 \$44,112 Y rar Pping % 10% \$44,112 \$44,112 \$44,112 Y rar Pping % 50% \$22,066 \$32,2066 Process Pping and Supports % 50% \$22,066 \$32,2066 Process Pping and Supports % 50% \$22,066 \$32,2066 B GC % 54,000 \$6,100 \$51,020 \$31,0280 B GC % 52,006 \$32,000 \$6,2100 \$6,2100 Concrete Wetwell Expansion 79 m3<<\$1,000		Equipment Rental	1	%		0.5%	\$ 9,655	\$ 1,448 (15%)	\$ 11,103	
Stead TSM TSM Stead Stead Stead Stead Stead Table % 10% \$ 44.112 \$ 44.112 Yran Poing % 10% \$ 44.112 \$ 54.41.12 \$ 54.41.12 Metalia % 2% \$ 58.622 \$ 58.626 \$ 52.2066 \$ 52.2066 \$ 52.2066 \$ 52.2066 \$ 58.2067 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.6168 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607 \$ 58.607		Sub-total General					\$ 260,685	\$ 1,448	\$ 262,133	-
2 start Piping since Pipi		Percentage of Capital Equipment (excludes collection system)								
3 Yard Pping 5 10% \$ 4.112 54.4112 4 Metals % 2% \$ 6.122 \$ 8.8.22 5 Additional Finables % 5% \$ 52.056 \$ 52.056 6 Increase Pinging % 5% \$ 52.056 \$ 52.056 7 Bectrial % 5% \$ 22.056 \$ 52.056 8 6C % 5% \$ 22.056 \$ 52.056 9 Bectrial Activity and Supports % \$ 5% \$ 22.056 \$ 52.056 9 Subtotal capital facility coats		Sitework		%		15%	\$ 66,168			
		-		%		10%	\$ 44,112			
6 Additional Finishes 5, 5, 5, 5, 22, 056 \$22, 056 \$22, 056 6 Process Pipping and Supports % 5%, 5%, 5, 22, 056 \$22, 056 \$22, 056 7 Electrical % 5%, 5%, 5, 22, 056 \$22, 056 \$22, 056 \$22, 056 8 Sc % 5%, 5%, 5, 22, 056 \$22, 056 \$22, 056 \$22, 056 9 Electrical capital facility costs \$5, 5%, 5, 22, 056 \$22, 056 \$22, 056 \$22, 056 1 Subtotal capital facility costs \$5, 40, 000 \$5, 100, 000 \$5, 100, 000 \$116, 500 Concrete Wetwell Expansion 79 m3 \$1, 500 \$116, 500 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$100, 000 \$20, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 000 \$22, 0		1.0								
6 Process Piping and Supports % 5% \$\$22,066 \$\$22,060 \$\$22,000 \$\$21,000 \$\$10,000						2%				
Sector % 25% § 110.280										
BCC % 5% \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 22,066 \$ 339,663 \$ 339,663 \$ 339,663 \$ 118,500 \$ 5118,500 \$ 5118,500 \$ 5118,500 \$ 5118,500 \$ 113,500 \$ 113,500 \$ 1										
Subtoal capital facility costs I \$ 339,663 Genset (125 W) 1 Lump Sum \$ 54,000 \$ 81,00 \$ 62,000 \$ 81,00 \$ 62,000 \$ 62,000 \$ 62,000 \$ 62,000 \$ 62,000 \$ 62,000 \$ 62,000 \$ 62,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,000 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,770 \$ 54,700 \$ 56,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 528,000 \$ 520,000 \$ 520,000 \$ 520,000 \$ 520,000 \$ 520,000 \$ 520,000 \$ 527,000 \$ 524,757 \$ 54,500 \$ 56,7500 \$ 51,750 \$ 54,500 \$ 56,7500 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,550 \$ 524,520 </td <td></td>										
Improvements to Navy St PS 1 Lump Sum \$ 54,000 \$ 54,000 \$ 8,100 (15%) \$ \$ 52,100 Genser (125 kW) 79 m3 \$ 1,000 \$ 100	8			%		5%	\$ 22,056		\$22,056	ductbank cost (x2)
Genese (125 kW) 1 Lump Sum \$ 54,000 \$ 8,100 (15%) \$ 52,100 Concrete Wetwell Expansion 79 m3 \$ 1,500 \$ 118,500 \$ 118,500 Building services improvements 6 m2 \$ 800 \$ 4,770 \$ 34,770 Brick finishing 70 m2 \$ 400 \$ 28,000 \$ 4,770 Brick finishing 70 m2 \$ 400 \$ 28,000 \$ 4,870 Sub-total Improvements Navy St. PS 5 205,270 \$ 8,600 \$ 4,800 \$ 51,000 Cancet St. PS 5 205,270 \$ 8,600 \$ 4,800 \$ 51,000 \$ 51,000 Cancet St. PS 5 205,270 \$ 8,6100 \$ 51,500 \$ 51,500 \$ 51,500 Cancet St. PS 5 20,000 \$ 4,500 \$ 4,500 \$ 5,750 \$ 11,500 Genese (100 kW) 1 Lump Sum \$ 10,000 \$ 5,750 \$ 127,750 \$ 247,572 Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration) \$ 247,572 \$ 247,572 \$ 247,572 New 200mm Piping 400 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>\$ 339,663</td> <td></td>									\$ 339,663	
Concrete Wetweil Expansion 79 m3 \$ 1,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 118,500 \$ 100,000 \$ 100,000 \$ 100,000 \$ 100,000 \$ 100,000 \$ 100,000 \$ 100,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 28,000 \$ 313,370 Byte order of the star St, PS \$ 20,000 \$ \$ 6,750 \$ 11,500 \$ \$ 11,500 \$ \$ 51,550 \$ \$ 11,500 \$ \$ 51,550 \$ \$ 11,500 \$ \$ \$ 51,750 \$ \$ 247,572 \$ 247,572 \$ 247,572 \$ 247,572 \$ \$ 247,572 \$ \$ 247,572 \$ \$ 247,572 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$			1	Lump Sum	\$	54 000	\$ 54 000	\$ 8 100 (15%)	\$ 62 100	
Refurbish existing sub-structure 1 Lump Sum \$100,000 \$100,000 \$100,000 structure Subt-total Improvements to W								\$ 0,100 (1070)		
Building services improvements 6 m2 \$ 800 \$ 4,770 \$ 4,770 Brick finishing 70 m2 \$ 400 \$ 28,000 \$ 24,000 Sub-total Improvements Navy St. PS \$ 305,270 \$ 8,100 \$ 313,370 Improvements to Water St. PS \$ 300,000 \$ 60,000 \$ 4,500 \$ 54,570 Cathodic Protection System 1 Lump Sum \$ 10,000 \$ 1,000 \$ 1,000 \$ 1,576 Sub-total Improvements to Water St. PS \$ 45,000 \$ 67,50 \$ 127,750 Collection System 1 Lump Sum \$ 1,076 \$ 247,572 \$ 247,572 Not along Navy and William 170 m \$ 4,500 \$ 765,000 \$ 765,000 New 200mm Piping 20 m \$ 511 \$ 224,256 \$ 224,256 New 350mm Piping 20 m \$ 511 \$ 248,200 \$ 19,240 New 150mm Piping 20 m \$ 962 \$ 19,240 \$ 19,240 Sub-total Collection System \$ 1,481,648 \$ 8,232 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>riigher unit cost for</td></td<>										riigher unit cost for
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Replace Pumps 2 unit \$ 30,000 \$ 60,000 \$ 4,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 64,500 \$ 51,750 \$ 11,500 \$ 51,750 \$ 51,550 \$ 52,5200 \$ 52,500 \$ 52,5200 \$ 52,500 \$ 52,5200 \$ 52,5200 \$ 52,5200 \$ 52,5200 \$ 52,5200 \$ 52,5200 \$ 52,520 \$ 52,5200 \$ 52,52,790 \$ 51,451,451 \$ 4,500 \$ 51,451,451 \$ 52,52,790		Sub-total Improvements Navy St. PS					\$ 305,270	\$ 8,100	\$ 313,370	
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New 200mm Piping 230 m \$ 1,076 \$ 247,572 \$ 247,572 mixed depth MT along Navy and William 170 m \$ 4,500 \$ 765,000 \$ 765,000 MT construction shafts 3 each \$ 75,000 \$ 225,000 \$ 225,000 New 350mm Piping 400 m \$ 511 \$ 204,256 \$ 204,256 New 150mm Piping 20 m \$ 962 \$ 19,240 \$ 19,240 Manhole 3 unit \$ 6,860 \$ 8,232 \$ 1,489,880 Sub-total Collection System \$ 1,0% \$ 225,320 \$ \$ 232,320 \$ 225,320 Subtotal capital facility costs \$ 1,481,648 \$ 8,232 \$ 1,489,880 Overhead & Profit (10% of A) 10% \$ 253,280 \$ 20,580 \$ 506,598 Overhead & Profit (10% of A) 5% \$ 506,598 \$ 506,598 Contingency (20% of A) 20% \$ 506,598 \$ 75,984 Construction Sequencing Allowance (3% of A) 3% \$ 75,984 \$ 506,598 Contingency (20% of Construction costs \$ 3,495,259 \$ 506,598 \$ 75,984 Interal Halton C		Sub-total Improvements to Water St. PS					\$ 45,000	\$ 6,750	\$ 127,750	
MT along Navy and William 170 m \$ 4,500 \$ 765,000 \$ 765,000 MT construction shafts 3 each \$ 75,000 \$ 225,000 \$ 225,000 New 350mm Piping 400 m \$ 511 \$ 204,256 \$ 204,256 \$ 204,256 New 150mm Piping 20 m \$ 962 \$ 19,240 \$ 19,240 \$ 19,240 Manhole 3 unit \$ 6,860 \$ 20,580 \$ 8,232 \$ 1,489,880 Sub-total Collection System \$ 1,481,648 \$ 8,232 \$ 1,489,880 A Subtotal capital facility costs \$ 2,532,797 Overhead & Profit (10% of A) 10% \$ 253,280 Overhead & Profit (10% of A) 20% \$ 516,659 Contingency (20% of A) 20% \$ 57,594 Contingency (20% of A) 3% \$ 75,594 Construction costs \$ 3,495,259 Engineering Design (15% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93						4 070	A A I T T A		A A I T T T	
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New 150mm Piping 20 m \$ 962 \$ 19,240 \$ 19,240 Manhole 3 unit \$ 6,860 \$ 20,580 \$ 8,232 (40%) \$ 28,812 Sub-total Collection System \$ 1,481,648 \$ 8,232 \$ 1,489,880 A Subtotal capital facility costs \$ 1,481,648 \$ 8,232 \$ 1,489,880 A Subtotal capital facility costs \$ 2,532,797 B Overhead & Profit (10% of A) 10% \$ 253,280 Contingency (20% of A) 5% \$ 126,640 Construction Sequencing Allowance (3% of A) 3% \$ 75,984 E Total est. construction costs \$ 3,495,259 Internal Halton Costs (10% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93				each						
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Sub-total Collection System \$ 1,481,648 \$ 8,232 \$ 1,489,880 Subtotal capital facility costs \$ 2,532,797 Overhead & Profit (10% of A) 10% \$ 253,280 MOB/Bond/Insurance (5% of A) 5% \$ 126,640 Contingency (20% of A) 20% \$ 506,559 Construction Sequencing Allowance (3% of A) 3% \$ 75,984 Total est. construction costs \$ 3,495,259 Internal Halton Costs (10% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93		New 150mm Piping	20	m	\$	962	\$ 19,240		\$ 19,240	
Subtotal capital facility costs \$ 2,532,797 3 Overhead & Profit (10% of A) 10% \$ 253,280 MOB/Bond/Insurance (5% of A) 5% \$ 126,640 Contingency (20% of A) 20% \$ 506,559 Construction Sequencing Allowance (3% of A) 3% \$ 75,984 Total est. construction costs \$ 3,495,259 Non-Construction costs Engineering Design (15% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93		Manhole	3	unit	\$	6,860	\$ 20,580	\$ 8,232 (40%)	\$ 28,812	
3 Overhead & Profit (10% of A) 10% \$253,280 MOB/Bond/Insurance (5% of A) 5% \$126,640 Contingency (20% of A) 20% \$506,559 Construction Sequencing Allowance (3% of A) 3% \$75,984 Image: Total est. construction costs \$3,495,259 Image: Total est. construction costs \$3,495,259 Image: Total est. construction costs \$24,288.89 Internal Halton Costs (10% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93		Sub-total Collection System					\$ 1,481,648	\$ 8,232	\$ 1,489,880	
3 Overhead & Profit (10% of A) 10% \$253,280 MOB/Bond/Insurance (5% of A) 5% \$126,640 Contingency (20% of A) 20% \$506,559 Construction Sequencing Allowance (3% of A) 3% \$75,984 Image: Total est. construction costs \$3,495,259 Image: Total est. construction costs \$3,495,259 Image: Total est. construction costs \$24,288.89 Internal Halton Costs (10% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93	٨	Subtotal capital facility costs							¢ 0 E00 707	-
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Non-Construction costs Engineering Design (15% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93	-									
Non-Construction costs Engineering Design (15% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93	E	Total est. construction costs							\$ 3,495,259	
Engineering Design (15% of E) - includes EA, destailed design and contr admin 15% 524,288.89 Internal Halton Costs (10% of E) 10% 349,525.93 Project Overall Contingency (10% of E) 10% 349,525.93										
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Project Overall Contingency (10% of E) 10% 349,525.93	F		unu admin							
	G	. ,								
Total Estimated Capital Costs \$4,718,601	н					10%			349,525.93	
	I	Total Estimated Capital Costs							\$ 4,718,6 <mark>0</mark> 1	1

Note: The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding. This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment,

11-03-14

Alternative 1 & 3 - Cost to Replace Water St to be Considered in Whole Life Cost

	anager: Brian R. Edwards							
0.	or Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Commen
Gen	eral Requirements							
Mobi	ilization	1	%	2%	\$ 18,132	\$-	\$ 18,132	
Supe	ervision	1	%	6%	\$ 54,395	\$ -	\$ 54,395	
Tem	porary Facilities	1	%	4%	\$ 36,264	\$ -	\$ 36,264	
Tem	porary Utilities	1	%	1%	\$ 9,066	\$ -	\$ 9,066	
Equi	ipment Rental	1	%	0.5%	\$ 4,533	\$680 (15%)	\$ 5,213	
Sub	-total General						\$ 123,070	
Perc	centage of Capital Equipment							
1 Sitev			%	10%	\$ 90,659		\$90,659	
2 Exca	avation, shoring and backfill		%	10%	\$ 90,659		\$90,659	
	d Piping		%	5%	\$ 45,329		\$45,329	
4 Meta			%	2%	\$ 18,132		\$18,132	
5 Addi	itional Finishes		%	5%	\$ 45,329		\$45,329	
6 Proc	cess Piping and Supports		%	5%	\$ 45,329		\$45,329	
7 Elect	strical		%	15%	\$ 135,988		\$135,988	
8 I&C			%	5%	\$ 45,329		\$45,329	
Subt	total capital facility costs						\$ 516,756	
	lacement of Water St. PS							
	kaged Pumping Station	1	Lump Sum	\$ 187,500	\$ 187,500	\$ 46,875 (25%)	\$ 234,375	
	crete Wetwell	158	m3	\$ 1,000	\$ 158,000		\$ 158,000	
	nolition of Existing PS	1	Lump Sum	\$ 100,000	\$ 100,000		\$ 100,000	
Gens	set (200 kW)	1	Lump Sum	\$ 90,000	\$ 90,000	\$ 22,500 (25%)	\$ 112,500	
	ocation of Water St. PS							
	/ 450mm Piping	50	m	\$ 551	\$ 27,560		\$ 27,560	Shallow p
	v 450mm Piping	90	m	\$ 2,344	\$ 210,974		\$ 210,974	Deep pipe
New	/ 300mm Forcemain	135	m	\$ 468	\$ 63,180		\$ 63,180	Shallow p
Sub-	-total Improvements to Water St. PS						\$ 906,589	
	total capital facility costs (A)						\$ 1,546,415	
	rhead & Profit (10% of A)			10%			\$ 154,641	
MOB	B/Bond/Insurance (5% of A)			5%			\$ 77,321	
	tingency (20% of A)			20%			\$ 309,283	
Cons	struction Sequencing Allowance (3% of A)			3%			\$ 46,392	
Tota	al est. construction costs						\$ 2,134,053	
	-Construction costs (E)							
_	ineering Design (15% of E) - includes EA, de	estailed design a	nd contr admin	15%			320,107.88	
	on Internal Costs (10% of E)			10%			213,405.25	
	ect Overall Contingency (10% of E)			10%			213,405.25	
Mid-	Year Point of Construction (0.5 years, 3%)						43,000.00	

Note:

The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding. This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment,

Navy and Water St WWPS & **Collection System Modernization** Feasibility Study

BUDGET COST ESTIMATE

11-03-14

	ared by: G. Nunes and J. Stevenson ect Manager: Brian R. Edwards							Black & Veato
No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	20/	\$ 20,866	\$ -	\$ 20,866	
	Supervision	1	%	2% 6%	\$ 20,866 \$ 62,599	\$ -	\$ 62,599	
	Temporary Facilities	1	%	4%	\$ 41,733	\$ -	\$ 41,733	
	Temporary Utilities	1	%	1%	\$ 10,433	\$-	\$ 10,433	
	Equipment Rental	1	%	0.5%	\$ 5,217	\$ 782 (15%)	\$ 5,999	
	Sub-total General						\$ 141,630	
	Percentage of Capital Equipment							
	Sitework		%	10%	\$ 104,331		\$104,331	
	Excavation, shoring and backfill		%	10%	\$ 104,331		\$104,331	
	Yard Piping		%	5%	\$ 52,166		\$52,166	
-	Metals		%	2%	\$ 20,866		\$20,866	
	Additional Finishes		%	5%	\$ 52,166		\$52,166	
	Process Piping and Supports		%	5%	\$ 52,166		\$52,166	
	Electrical I&C		%	20% 5%	\$ 208,663 \$ 52,166		\$208,663 \$52,166	20% for electrical ductbank cost
	Subtotal capital facility costs						\$ 646,854	
	Replacement of Navy St. PS						¥ 040,004	
	Packaged Pumping Station	1	Lump Sum	\$ 356,250	\$ 356,250	\$ 89,063 (25%)	\$ 445,313	
	Concrete Wetwell	328	m3	\$ 1,000	\$ 328,000		\$ 328,000	
	Demolition of Existing PS	1	Lump Sum	\$ 150,000	\$ 150,000		\$ 150,000	
	Genset (250 kW)	1	Lump Sum	\$ 96,000	\$ 96,000	\$ 24,000 (25%)	\$ 120,000	
	Sub-total Replacement of Navy St. PS						\$ 1,043,313	
4	Subtotal capital facility costs (A)						\$ 1,831,796	
3	Overhead & Profit (10% of A)			10%			\$ 183,180	
2	MOB/Bond/Insurance (5% of A)			5%			\$ 91,590	
)	Contingency (20% of A)			20%			\$ 366,359	
	Construction Sequencing Allowance (3% of A)			3%			\$ 54,954	
	Total est. construction costs						\$ 2,527,878	
_	Non-Construction costs							
	Engineering Design (15% of E) - includes EA, des	tailed design ar	nd contr admin	15%			379,181.76	
ì	Halton Internal Costs (10% of E)			10%			252,787.84	
	Project Overall Contingency (10% of E) Mid-Year Point of Construction (0.5 years, 3%)			10%			252,787.84 51,000.00	
							01,000.00	
ł	Total Estimated Capital Costs						\$ 3,463,636	

Note: The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Whole Life Cost and Net Present Value

11-03-14

Alternative 1: Navy St. Pumping Station is Upgraded to Future Capacity and Water St. PS Remains Operational at Current Capacity

Capital Costs	
Cost Item	CAD \$
Construction	
Subtotal capital facility costs (A)	\$3,176,877
Overhead & Profit (10% of A)	\$317,688
MOB/Bond/Insurance (5% of A)	\$158,844
Construction Contingency (20% of A)	\$635,375
Construction Sequencing Allowance (3% of A)	\$95,306
Construction sub total	\$4,384,090
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destailed des	\$657,613
Halton Internal Costs (10% of E)	\$438,409
Project Overall Contingency (10% of E)	\$438,409
Non-construction sub total	\$1,534,431
Mid-Year Point of Construction	\$88,000
(mid-year, %) (0.5	years, 3.0%)
Total (no contingency applied)	\$6,006,521

Routine O&M Costs

Cost Item	Note	Power (kw)	\$per kwh ¹	Usage factor ²	Annual Cost ³
Navy St PS	S&L selection	60	0.1	0.6	\$31,536
Water St PS	Existing Pumps	30	0.1	0.9	\$23,652
Staff time	1 operator				\$45,000
Transport					\$10,000
Electrics maintenance					\$5,000
Mechanical maintenance					\$5,000
Civil maintenance					\$3,000
Security/safety					\$10,000
Administration costs					\$1,000
Total					\$134,188

The annual power costs were calculated using rate of 0.1\$/kWh.
 Usage factor applied for expected frequency of use.

Average operation 2 pumps at Navy St. PS; considering 1 hr retention time in wetwell at peak instantaneous flows.

Average operation 2 pumps at Water St. PS; considering 15 min retention time in wetwell at peak instantaneous flows.

3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

Periodic Maintenance Costs

Cost Item	Frequency	Cost	Note
Electrics	every 30 years	\$30,000	per pmp group
Controls	every 15 years	\$15,000	por prine group
Pumps and accessories	every 30 years	\$193,200	per pmp group
Building services	every 20 years	\$20,000	per building
Civil refurbishment	every 30 years	\$100,000	
			from original
Replacement of Water St. PS	every 50 years	\$2,923,971	construction

Whole Life Cost

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no	le Life Cost						
r	Note	Annual O&M	Capital a	nd Refurbishme	ent Costs	Annual Cost	PV
	Capital Investiment	\$134,188	\$6,006,521			\$6,140,709	\$6,140,709
		\$134,188				\$134,188	\$127,798
		\$134,188				\$134,188	\$121,712
	Replace Water St. PS due to age, built in 1967.	\$134,188	\$2,923,971			\$3,058,159	\$3,039,888
		\$134,188				\$134,188	\$110,397
		\$134,188				\$134,188	\$105,140
		\$134,188				\$134,188	\$100,133
		\$134,188				\$134,188	\$95,365
		\$134,188				\$134,188	\$90,824
		\$134,188				\$134,188	\$86,499
)		\$134,188				\$134,188	\$82,380
		\$134,188				\$134,188	\$78,457
		\$134,188				\$134,188	\$74,721
		\$134,188				\$134,188	\$71,163
		\$134,188				\$134,188	\$67,774
	Controls for new Navy St. PS	\$134,188	\$15,000			\$149,188	\$71,762
;		\$134,188				\$134,188	\$61,473
,		\$134,188				\$134,188	\$58,546
;	Controls for new Water St. PS	\$134,188	\$15,000			\$149,188	\$61,991
)		\$134,188				\$134,188	\$53,103
)	Building services for new Navy St PS	\$134,188	\$20,000			\$154,188	\$58,112
		\$134,188				\$134,188	\$48,166
		\$134,188				\$134,188	\$45,872
	Building services for new Water St PS	\$134,188	\$20,000			\$154,188	\$50,199
		\$134,188				\$134,188	\$41,607
		\$134,188				\$134,188	\$39,626
		\$134,188				\$134,188	\$37,739
		\$134,188				\$134,188	\$35,942
		\$134,188				\$134,188	\$34,231
		\$134,188				\$134,188	\$32,600
	Major refurb Navy St.PS - elect, pmps and civil	\$134,188	\$30,000	\$193,200	\$100,000	\$457,388	\$105,829
al						\$13,483,520	\$11,229,75

Whole Life Cost and Net Present Value

11-03-14

Alternative 2: Eliminate Navy St. Pumping Station and Divert Total Flows to Water St. PS

Cost Item	
Construction	
Subtotal capital facility costs (A)	\$5,204,962
Overhead & Profit (10% of A)	\$520,496
MOB/Bond/Insurance (5% of A)	\$260,248
Construction Contingency (20% of A)	\$1,040,992
Construction Sequencing Allowance (3% of A)	\$156,149
Construction sub total	\$7,182,847.56
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destailed	\$1,077,427.13
Internal Halton Costs (10% of E)	\$718,285
Project Overall Contingency (10% of E)	\$718,285
Non-construction sub total	\$2,513,997
Mid-Year Point of Construction	\$144,000
(mid-year, %)	(0.5 years, 3.0%
Total (no contingency applied)	\$9,840,844

Routine O&M Costs

Cost Item	Note	Power (kw)	\$per kwh ¹	Usage factor ²	Annual cost ³
Water St PS	S&L selection	40	0.1	0.6	\$21,024
Staff time	Part-time operate	or			\$22,500
Transport	70% Alt 1				\$7,000
Electrics maintenance	70% Alt 1				\$3,500
Mechanical maintenance	70% Alt 1				\$3,500
Civil maintenance	70% Alt 1				\$2,000
Security/safety	50% Alt 1				\$5,000
Administration costs	Alt 1				\$1,000
Total					\$65,524

1. The annual power costs were calculated using rate of 0.1\$/kWh.

2. Usage factor applied for expected frequency of use.

Average operation 2 pumps at Water St. PS; considering 1 hr retention time in wetwell at peak instantaneous flows.

3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

PeriodicMaintenance Costs

Cost Item	Frequency	Cost	Note
Electrics	every 30 years	30,000	per pmp group
Controls	every 15 years	15,000	
Pumps and accessories	every 30 years	193,200	per pmp group
Building services	every 20 years	20,000	per building
Civil refurbishment	every 30 years	100,000	

						Discount Rate	0.05
Whole Year	e Life Cost Note	Annual O&M	Canital a	nd Refurbishmen	at Costs	Annual Cost	PV
0	Capital investment	\$65,524	\$9,840,844	iu Kerui bisiimen		\$9,906,368	\$9,906,368
1	Capital Investment	\$65,524 \$65	\$3,040,044			\$65,524	\$62,404
2		\$65,524				\$65,524	\$59,432
3		\$65,524				\$65,524	\$56,602
4		\$65,524 \$65				\$65,524	\$53,907
5		\$65,524				\$65,524	\$51,340
6		\$65,524				\$65,524	\$48,895
7		\$65,524				\$65,524	\$46,567
8		\$65,524				\$65,524	\$44,349
9		\$65,524				\$65,524	\$42,237
10		\$65,524				\$65,524	\$40,226
11		\$65,524				\$65,524	\$38,311
12		\$65,524				\$65,524	\$36,486
13		\$65,524				\$65,524	\$34,749
14		\$65,524				\$65,524	\$33,094
15	Controls for Water St PS	\$65,524	\$15,000			\$80,524	\$38,733
16		\$65,524				\$65,524	\$30,017
17		\$65,524				\$65,524	\$28,588
18		\$65,524				\$65,524	\$27,227
19		\$65,524				\$65,524	\$25,930
20	Building for Water St PS	\$65,524	\$20,000			\$85,524	\$32,233
21		\$65,524				\$65,524	\$23,519
22		\$65,524				\$65,524	\$22,399
23		\$65,524				\$65,524	\$21,333
24		\$65,524				\$65,524	\$20,317
25		\$65,524				\$65,524	\$19,349
26		\$65,524				\$65,524	\$18,428
27		\$65,524				\$65,524	\$17,550
28		\$65,524				\$65,524	\$16,715
29		\$65,524				\$65,524	\$15,919
30	Major refurb Water St PS elect, pmps and civil	\$65,524	\$30,000	\$193,200	\$100,000	\$388,724	\$89,942
Total						\$12,230,288	\$11,003,167

Whole Life Cost and Net Present Value

11-03-14

Alternative 3: Navy St. Remains Operational at Current Capacity and Divert Partial Flows to Water St. PS

Capital Costs	
Cost Item	
Construction	
Subtotal capital facility costs	\$2,532,797
Overhead & Profit (10% of A)	\$253,280
MOB/Bond/Insurance (5% of A)	\$126,640
Contingency (20% of A)	\$506,559
Construction Sequencing Allowance (3% of A)	\$75,984
Construction sub total	\$3,495,259
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destaile	\$524,289
Internal Halton Costs (10% of E)	\$349,526
Project Overall Contingency (10% of E)	\$349,526
Non-construction sub total	\$1,223,341
Mid-Year Point of Construction	\$70,000
(mid-year, %) (0.5	years, 3.0%)
Total (no contingency applied)	\$4,788,600

Routine O&M costs

Cost Item	Note	Power (kw)	\$per kwh ¹	Usage factor ²	Annual cost ³
Navy St PS		68	0.1	0.6	\$35,741
Water St PS		30	0.1	0.6	\$15,768
Staff time	1 operator				\$45,000
Transport	Alt 1				\$10,000
Electrics maintenance	Alt 1				\$5,000
Mechanical maintenance	Alt 1				\$5,000
Civil maintenance	Alt 1				\$3,000
Security/safety	Alt 1				\$10,000
Administration costs	Alt 1				\$1,000
Total					\$130,509

1. The annual power costs were calculated using rate of 0.1\$/kWh.

2. Usage factor applied for expected frequency of use.

Average operation 2 pumps at Water St. PS; considering 15 min retention time in wetwell at peak instantaneous flows.

3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

Periodic maintenance costs

Cost Item	Frequency	Cost Navy	Cost Water	Note
Electrics	every 30 years	30,000.00	20,000.00	per pup group
Controls	every 15 years	15,000.00	10,000.00	
Pumps and accessories	every 30 years	124,200.00	82,800.00	per pup group
Building services	every 20 years	25,000.00	25,000.00	per building
Civil refurbishment	every 30 years	100,000.00	70,000.00	
Replacement of Pumping Station	every 50 years	\$3,463,636	\$2,923,971	from original construction
Credit for equipment re-use	every 50 years		-\$25,200	

					Discount Rate	0.05
Nhole Year	e life cost Note	Annual O&M	Capital and	d refurbishment costs	Annual cost	PV
0	Capital Invstment	\$130,509	\$4,788,600		\$4,919,109	\$4,919,109
1	·	\$130,509			\$130,509	\$124,294
2		\$130,509			\$130,509	\$118,375
3	Replace Water St. PS due to age, built in 1967.	\$130,509	\$2,923,971	-\$25,200	\$3,029,280	\$3,011,509
4		\$130,509			\$130,509	\$107,370
5		\$130,509			\$130,509	\$102,257
6		\$130,509			\$130,509	\$97,388
7		\$130,509			\$130,509	\$92,750
8		\$130,509			\$130,509	\$88,333
9		\$130,509			\$130,509	\$84,127
10		\$130,509			\$130,509	\$80,121
11		\$130,509			\$130,509	\$76,306
12		\$130,509			\$130,509	\$72,672
13		\$130,509			\$130,509	\$69,212
14		\$130,509			\$130,509	\$65,916
15	Controls for Navy St PS	\$130,509	\$15,000		\$145,509	\$69,992
16		\$130,509			\$130,509	\$59,788
17		\$130,509			\$130,509	\$56,941
18	Controls for new Water St. PS	\$130,509	\$10,000		\$140,509	\$58,384
19		\$130,509			\$130,509	\$51,647
20		\$130,509			\$130,509	\$49,187
21	Replace Navy St. PS due to age, built in 1985.	\$130,509	\$3,463,636	\$0	\$3,594,145	\$3,510,481
22		\$130,509			\$130,509	\$44,614
23		\$130,509			\$130,509	\$42,490
24		\$130,509			\$130,509	\$40,467
25		\$130,509			\$130,509	\$38,540
26		\$130,509			\$130,509	\$36,704
27		\$130,509			\$130,509	\$34,957
28		\$130,509			\$130,509	\$33,292
29		\$130,509			\$130,509	\$31,707
30		\$130,509			\$130,509	\$30,197
Total					\$15,221,780	\$13,299,126