Appendix E

Detailed Cost Estimates for Short-Listed Alternatives

Alternative A - Ontario St

CAPITAL COSTS					
Item	Unit Cost	Unit	Quantity	Cost	Comments
600 mm HDPE Pipe	$ 1,050	m	2020	$ 2,121,000	Supply and installation
Fittings and Connections	$ 400,000	LS	1	$ 400,000	Bends, couplings, expansion joints
Restoration	$ 750,000	LS	1	$ 750,000	Sod, curbs, asphalt, pavement
Chambers	$ 75,000	LS	3	$ 225,000	Air valves and drain chambers
New connection at HUSP MH	$ 100,000	LS	1	$ 100,000	FM reception chamber near HUSP MH
Bridge Crossing	$ 250,000	LS	1	$ 250,000	Pipe brackets and anchor system, pipe insulation
New pumps for Fulton PS	$ 100,000	each	6	$ 600,000	Different forcemain alignments require replacement of
Miscellaneous Construction Items	$ 250,000	LS	1	$ 250,000	Silt fencing, traffic control, catch basins
Sub-Total				**$ 4,696,000**	
Contractor Overhead & Profit			10%	**$ 470,000**	
Engineering & Contingency			25%	**$ 1,174,000**	
TOTAL CAPITAL COST				**$ 6,340,000**	

ANNUAL O&M COSTS (at 18.5 ML/d)					
Item	Unit Cost	Units	Quantity	Cost per Year	Comments
Pumping to HUSP MH	$ 0.10	kWh	220,038	$ 22,004	Energy Cost to Pump to HUSP MH ($0.1/kwh), FM lengt
Maintenance	25	m	2,020	$ 50,500	$25/m of forcemain average annual cost
TOTAL ANNUAL O&M COST				**$ 72,504**	

LIFE-CYCLE COST					
Year	**Flow (ML/d)**	**Capital ($2016)**	**O&M ($2016)**	**PV Cost (2016)**	**6% interest, 2% inflation**
0	15.5	$ 6,340,000	$ 67,563	$ 6,407,563	Assume operation of one forcemain at average flows to
1	15.77		$ 67,967	$ 65,402	
2	16.05		$ 68,379	$ 63,316	
3	16.32		$ 68,801	$ 61,303	
4	16.59		$ 69,232	$ 59,359	
5	16.86		$ 69,672	$ 57,482	
6	17.14		$ 70,121	$ 55,669	
7	17.41		$ 70,580	$ 53,919	
8	17.68		$ 71,047	$ 52,228	
9	17.95		$ 71,523	$ 50,594	
10	18.5		$ 72,504	$ 49,352	Assume continued operation of Milton WWTP for 10 ye
11	18.5		$ 72,504	$ 47,490	at which time, all flow goes to Mid-Halton WWTP
12	18.5		$ 72,504	$ 45,698	
13	18.5		$ 72,504	$ 43,973	
14	18.5		$ 72,504	$ 42,314	
15	18.5		$ 72,504	$ 40,717	
16	18.5		$ 72,504	$ 39,180	
17	18.5		$ 72,504	$ 37,702	
18	18.5		$ 72,504	$ 36,279	
19	18.5		$ 72,504	$ 34,910	
20	18.5		$ 72,504	$ 33,593	
21	18.5		$ 72,504	$ 32,325	
22	18.5		$ 72,504	$ 31,105	
23	18.5		$ 72,504	$ 29,932	
24	18.5		$ 72,504	$ 28,802	
25	18.5		$ 72,504	$ 27,715	
26	18.5		$ 72,504	$ 26,669	
27	18.5		$ 72,504	$ 25,663	
28	18.5		$ 72,504	$ 24,695	
29	18.5		$ 72,504	$ 23,763	
30	18.5		$ 72,504	$ 22,866	
31	18.5		$ 72,504	$ 22,003	
32	18.5		$ 72,504	$ 21,173	
33	18.5		$ 72,504	$ 20,374	
34	18.5		$ 72,504	$ 19,605	
35	18.5		$ 72,504	$ 18,865	
36	18.5		$ 72,504	$ 18,153	
37	18.5		$ 72,504	$ 17,468	
38	18.5		$ 72,504	$ 16,809	
39	18.5		$ 72,504	$ 16,175	
40	18.5		$ 72,504	$ 15,564	
41	18.5		$ 72,504	$ 14,977	
42	18.5		$ 72,504	$ 14,412	
43	18.5		$ 72,504	$ 13,868	
44	18.5		$ 72,504	$ 13,345	
45	18.5		$ 72,504	$ 12,841	
46	18.5		$ 72,504	$ 12,357	

Alternative B - Commercial Street

CAPITAL COSTS					
Item	**Unit Cost**	**Unit**	**Quantity**	**Cost**	**Comments**
600 mm HDPE Pipe	$ 1,050	m	1550	$ 1,627,500	Supply and installation
Fittings and Connections	$ 300,000	LS	1	$ 300,000	Bends, couplings, expansion joints
Restoration	$ 500,000	LS	1	$ 500,000	Sod, curbs, asphalt, pavement
Chambers	$ 75,000	LS	3	$ 225,000	Air valves and drain chambers
New connection at HUSP MH	$ 100,000	LS	1	$ 100,000	FM reception chamber near HUSP MH
Creek crossing	$ 1,000,000	LS	1	$ 1,000,000	Tunnelling
New pumps for Fulton PS	$ 100,000	each	3	$ 300,000	Same alignment as existing forcemain will require replacemer
Miscellaneous Construction Items	$ 500,000	LS	1	$ 500,000	Silt fencing, traffic control, catch basins, vibration monitoring,
Sub-Total				**$ 4,552,500**	
Contractor Overhead & Profit			10%	**$ 455,000**	
Engineering & Contingency			25%	**$ 1,138,000**	
TOTAL CAPITAL COST				**$ 6,150,000**	

ANNUAL O&M COSTS (at 18.5 ML/d)					
Item	**Unit Cost**	**Units**	**Quantity**	**Cost per Year**	**Comments**
Pumping to HUSP MH	$ 0.10	kWh	204,440	$ 20,444	Energy Cost to Pump to HUSP MH ($0.1/kwh), FM length of 1
Maintenance	25	m	1,550	$ 38,750	$25/m of forcemain average annual cost
TOTAL ANNUAL O&M COST				**$ 59,194**	

LIFE-CYCLE COST					
Year	**Flow (ML/d)**	**Capital ($2016)**	**O&M ($2016)**	**PV Cost (2016)**	**6% interest, 2% inflation**
0	15.5	$ 6,150,000	$ 54,989	$ 6,204,989	Assume operation of one forcemain at average flows to main
1	15.77		$ 55,339	$ 53,251	
2	16.05		$ 55,695	$ 51,571	
3	16.32		$ 56,058	$ 49,948	
4	16.59		$ 56,427	$ 48,380	
5	16.86		$ 56,803	$ 46,864	
6	17.14		$ 57,185	$ 45,399	
7	17.41		$ 57,574	$ 43,983	
8	17.68		$ 57,969	$ 42,614	
9	17.95		$ 58,371	$ 41,290	
10	18.5		$ 59,194	$ 40,292	Assume continued operation of Milton WWTP for 10 years,
11	18.5		$ 59,194	$ 38,772	at which time, all flow goes to Mid-Halton WWTP
12	18.5		$ 59,194	$ 37,309	
13	18.5		$ 59,194	$ 35,901	
14	18.5		$ 59,194	$ 34,546	
15	18.5		$ 59,194	$ 33,242	
16	18.5		$ 59,194	$ 31,988	
17	18.5		$ 59,194	$ 30,781	
18	18.5		$ 59,194	$ 29,619	
19	18.5		$ 59,194	$ 28,502	
20	18.5		$ 59,194	$ 27,426	
21	18.5		$ 59,194	$ 26,391	
22	18.5		$ 59,194	$ 25,395	
23	18.5		$ 59,194	$ 24,437	
24	18.5		$ 59,194	$ 23,515	
25	18.5		$ 59,194	$ 22,627	
26	18.5		$ 59,194	$ 21,774	
27	18.5		$ 59,194	$ 20,952	
28	18.5		$ 59,194	$ 20,161	
29	18.5		$ 59,194	$ 19,400	
30	18.5		$ 59,194	$ 18,668	
31	18.5		$ 59,194	$ 17,964	
32	18.5		$ 59,194	$ 17,286	
33	18.5		$ 59,194	$ 16,634	
34	18.5		$ 59,194	$ 16,006	
35	18.5		$ 59,194	$ 15,402	
36	18.5		$ 59,194	$ 14,821	
37	18.5		$ 59,194	$ 14,262	
38	18.5		$ 59,194	$ 13,723	
39	18.5		$ 59,194	$ 13,206	
40	18.5		$ 59,194	$ 12,707	
41	18.5		$ 59,194	$ 12,228	
42	18.5		$ 59,194	$ 11,766	
43	18.5		$ 59,194	$ 11,322	
44	18.5		$ 59,194	$ 10,895	
45	18.5		$ 59,194	$ 10,484	
46	18.5		$ 59,194	$ 10,088	
47	18.5		$ 59,194	$ 9,708	
48	18.5		$ 59,194	$ 9,341	

Alternative C - Residential

CAPITAL COSTS					
Item	**Unit Cost**	**Unit**	**Quantity**	**Cost**	**Comments**
600 mm HDPE Pipe	$ 1,050	m	2650	$ 2,782,500	Supply and installation
Fittings and Connections	$ 500,000	LS	1	$ 500,000	Bends, couplings, expansion joints
Restoration	$ 400,000	LS	1	$ 400,000	Sod, curbs, asphalt, pavement
Chambers	$ 75,000	LS	3	$ 225,000	Air valves and drain chambers
New connection at HUSP MH	$ 100,000	LS	1	$ 100,000	FM reception chamber near HUSP MH
Creek crossing	$ 1,000,000	LS	1	$ 1,000,000	Tunnelling
New pumps for Fulton PS	$ 100,000	each	6	$ 600,000	Different forcemain alignments require replacement of all pu
Miscellaneous Construction Items	$ 600,000	LS	1	$ 600,000	Silt fencing, traffic control, catch basins, vibration monitoring,
Sub-Total				**$ 6,207,500**	
Contractor Overhead & Profit			10%	**$ 621,000**	
Engineering & Contingency			25%	**$ 1,552,000**	
TOTAL CAPITAL COST				**$ 8,380,000**	

ANNUAL O&M COSTS (at 18.5 ML/d)					
Item	**Unit Cost**	**Units**	**Quantity**	**Cost per Year**	**Comments**
Pumping to HUSP MH	$ 0.10	kWh	228,658	$ 22,866	Energy Cost to Pump to HUSP MH ($0.1/kwh), FM length of 2
Maintenance	25	m	2,650	$ 66,250	$25/m of forcemain average annual cost
TOTAL ANNUAL O&M COST				**$ 89,116**	

LIFE-CYCLE COST

Year	Flow (ML/d)	Capital ($2016)	O&M ($2016)	PV Cost (2016)	6% interest, 2% inflation
0	15.5	$ 8,380,000	$ 83,702	$ 8,463,702	Assume operation of one forcemain at average flows to main
1	15.77		$ 84,136	$ 80,961	
2	16.05		$ 84,581	$ 78,318	
3	16.32		$ 85,038	$ 75,770	
4	16.59		$ 85,507	$ 73,312	
5	16.86		$ 85,987	$ 70,942	
6	17.14		$ 86,479	$ 68,656	
7	17.41		$ 86,983	$ 66,450	
8	17.68		$ 87,499	$ 64,321	
9	17.95		$ 88,026	$ 62,267	
10	18.5		$ 89,116	$ 60,659	Assume continued operation of Milton WWTP for 10 years,
11	18.5		$ 89,116	$ 58,370	at which time, all flow goes to Mid-Halton WWTP
12	18.5		$ 89,116	$ 56,168	
13	18.5		$ 89,116	$ 54,048	
14	18.5		$ 89,116	$ 52,009	
15	18.5		$ 89,116	$ 50,046	
16	18.5		$ 89,116	$ 48,157	
17	18.5		$ 89,116	$ 46,340	
18	18.5		$ 89,116	$ 44,592	
19	18.5		$ 89,116	$ 42,909	
20	18.5		$ 89,116	$ 41,290	
21	18.5		$ 89,116	$ 39,732	
22	18.5		$ 89,116	$ 38,232	
23	18.5		$ 89,116	$ 36,789	
24	18.5		$ 89,116	$ 35,401	
25	18.5		$ 89,116	$ 34,065	
26	18.5		$ 89,116	$ 32,780	
27	18.5		$ 89,116	$ 31,543	
28	18.5		$ 89,116	$ 30,353	
29	18.5		$ 89,116	$ 29,207	
30	18.5		$ 89,116	$ 28,105	
31	18.5		$ 89,116	$ 27,044	
32	18.5		$ 89,116	$ 26,024	
33	18.5		$ 89,116	$ 25,042	
34	18.5		$ 89,116	$ 24,097	
35	18.5		$ 89,116	$ 23,188	
36	18.5		$ 89,116	$ 22,313	
37	18.5		$ 89,116	$ 21,471	
38	18.5		$ 89,116	$ 20,660	
39	18.5		$ 89,116	$ 19,881	
40	18.5		$ 89,116	$ 19,131	
41	18.5		$ 89,116	$ 18,409	
42	18.5		$ 89,116	$ 17,714	
43	18.5		$ 89,116	$ 17,046	
44	18.5		$ 89,116	$ 16,402	
45	18.5		$ 89,116	$ 15,783	
46	18.5		$ 89,116	$ 15,188	
47	18.5		$ 89,116	$ 14,615	
48	18.5		$ 89,116	$ 14,063	

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