Millbrook Water Storage and
Water Servicing Expansion
Class Environmental Assessment

APPENDIX F

Cost Estimate

Table 1 - 100 Year Life Cycle Capital Cost Estimates for Existing and Proposed Facilities

						100 Year Replacement Timings								
Facility	**Component**	**Year of Construction**	**% of Total Cost**	**Replacement Cost**	**Life Expectancy**	**Replacement #1 (2014 if component age is past its useful life)**	**Replacement #2**	**Replacement #3**	**Replacement #4**	**Replacement #5**	**Replacement #6**	**Replacement #7**	**Number of Replacements over 100 years**	**Total 100 year Capital Costs**
New Small Tank - Elevated Tank - Alt 2A	Process Equipment	2014	5%	$70,000	30	2044	2074	2104					3	$210,000
	Process Electrical	2014	2%	$30,000	30	2044	2074	2104					3	$90,000
	Instrumentation	2014	2%	$25,000	15	2029	2044	2059	2074	2089	2104		6	$150,000
	Process Piping	2014	2%	$32,000	50	2064							1	$32,000
	Structural	2014	87%	$1,300,000	60	2074							1	$1,300,000
	Architectural	2014	0%	$0	30	2044	2074	2104					3	$0
	Building Services	2014	0%	$0	30	2044	2074	2104					3	$0
	Site Works	2014	2%	$32,850	40	2054	2094						2	$65,700
			100%	**$1,489,850**		**Total 100 Year Life Cycle Capital Cost of Tank**								**$1,847,700**
New Small Tank - Standpipe Tank - Alt 2B	Process Equipment	2014	11%	$70,000	30	2044	2074	2104					3	$210,000
	Process Electrical	2014	5%	$30,000	30	2044	2074	2104					3	$90,000
	Instrumentation	2014	4%	$25,000	15	2029	2044	2059	2074	2089	2104		6	$150,000
	Process Piping	2014	5%	$32,000	50	2064							1	$32,000
	Structural	2014	63%	$400,000	60	2074							1	$400,000
	Architectural	2014	7%	$43,350	30	2044	2074	2104					3	$130,050
	Building Services	2014	0%	$0	30	2044	2074	2104					3	$0
	Site Works	2014	5%	$32,850	40	2054	2094						2	$65,700
	Total		**100%**	**$633,200**		**Total 100 Year Life Cycle Capital Cost of Tank**								**$1,077,750**
New Large Tank	Process Equipment	2014	8%	$70,000	30	2044	2074	2104					3	$210,000
	Process Electrical	2014	3%	$30,000	30	2044	2074	2104					3	$90,000
	Instrumentation	2014	1%	$12,500	15	2029	2044	2059	2074	2089	2104		6	$75,000
	Process Piping	2014	4%	$32,000	50	2064							1	$32,000
	Structural	2014	80%	$725,000	60	2074							1	$725,000
	Architectural	2014	0%	$0	30	2044	2074	2104					3	$0
	Building Services	2014	0%	$0	30	2044	2074	2104					3	$0
	Site Works	2014	4%	$40,000	40	2054	2094						2	$80,000
	Total		**100%**	**$909,500**		**Total 100 Year Life Cycle Capital Cost of Tank**								**$1,212,000**
New Booster Station	Process Equipment	2014	20%	$60,000	30	2044	2074	2104					3	$180,000
	Process Electrical	2014	15%	$45,000	30	2044	2074	2104					3	$135,000
	Instrumentation	2014	5%	$15,000	15	2029	2044	2059	2074	2089	2104		6	$90,000
	Process Piping	2014	10%	$30,000	50	2064							1	$30,000
	Structural	2014	20%	$60,000	60	2074							1	$60,000
	Architectural	2014	15%	$45,000	30	2044	2074	2104					3	$135,000
	Building Services	2014	5%	$15,000	30	2044	2074	2104					3	$45,000
	Site Works	2014	10%	$30,000	40	2054	2094						2	$60,000
	Total		**100%**	**$300,000**		**Total 100 Year Life Cycle Capital Cost of PS**								**$735,000**
Existing Tank	Process Equipment	1970	8%	$91,000	30	2014	2044	2074	2104				4	$364,000
	Process Electrical	1970	3%	$39,000	30	2014	2044	2074	2104				4	$156,000
	Instrumentation	1970	1%	$16,250	15	2014	2029	2044	2059	2074	2089	2104	7	$113,750
	Process Piping	1970	4%	$41,600	50	2020	2070						1	$41,600
	Structural	1970	80%	$942,500	60	2030	2090						1	$942,500
	Architectural	1970	0%	$0	30	2014	2044	2074	2104				4	$0
	Building Services	1970	0%	$0	30	2014	2044	2074	2104				4	$0
	Site Works	1970	4%	$52,000	40	2014	2054	2094					3	$156,000
	Total		**100%**	**$1,182,350**		**Total 100 Year Life Cycle Capital Cost of Tank**								**$1,773,850**

*existing tank replacement based on large tank costs, but with increase due to inflation etc.

Table 2 - Total Life Cycle Cost Estimates

	New Small Elevated Tank (700 m3)	New Small Standpipe (700 m3)	New Large Tank (2,100 m3)	Existing Tank (1,400 m3)	New Booster Station (5 L/s)
Construction Cost	$1,489,850	$633,200	$909,500	----	$300,000
Life Cycle Capital Renewal Costs	$1,847,700	$1,077,750	$1,212,000	$1,798,850	$735,000
Total Life Cycle Capital Costs (A)	**$3,337,550**	**$1,710,950**	**$2,121,500**	**$1,798,850**	**$1,035,000**
Annual O&M	$10,000	$10,000	$10,000	$20,000	$4,000
O&M as % of capital	1%	2%	1%	1.7%	1%
100 Year Life Cycle O&M Costs (B)	**$1,000,000**	**$1,000,000**	**$1,000,000**	**$2,000,000**	**$400,000**
Total Life Cycle Costs (A+B)	**$4,337,550**	**$2,710,950**	**$3,121,500**	**$3,798,850**	**$1,435,000**

*as tank ages, O&M cost will increase; this will also

Table 3 - Summary Table of Capital Cost & Life Cycle Cost for Alternatives

	Alternative 2A - new small elevated tank (& ex. tank)	Alternative 2B - new small standpipe tank (& ex. tank)	Alternative 3 - new large tank	
Tank Capital Cost	$1,489,850	$633,200	$909,500	
Booster Pumping Station	$300,000	$300,000	$300,000	
Watermain	540000	$540,000	$540,000	
Decommissioning of Ex. Tank	0	$0	$200,000	
Total Capital Cost	**$2,329,850**	**$1,473,200**	**$1,949,500**	
Life Cycle Cost for New Tank	$4,337,550	$2,710,950	$3,121,500	
Life Cycle Cost for Booster Pumping Station	$1,435,000	$1,435,000	$1,435,000	
Life Cycle Cost for Existing Tank	$3,798,850	$3,798,850	$200,000	decommissioning cost
Life Cycle Cost for Watermain	$540,000	$540,000	$540,000	
Total Life Cycle Cost	**$10,111,400**	**$8,484,800**	**$5,296,500**	