

**REFINEMENT OPTIONS -- ESTIMATED CAPITAL COSTS**

	Estimated Capital Cost
<b>Authorized CSO Remedial Measures Plan (July 2001)</b>	<b>\$953 million</b>
<b>Authorized CSO Remedial Measures Plan (Based on Current Pre-design Costs)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$153 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$677 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$7 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$35 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$117 million
<b>Total Estimated Capital Costs</b>	<b>\$989 million</b>
<b>Refinement Option No. 1 – 27% Separation (Greensferry, McDaniel, Stockade)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$153 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$522 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$7 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$35 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$117 million
<b>Total Estimated Capital Costs</b>	<b>\$834 million</b>
<b>Refinement Option No. 2 – 40% Separation (East Area)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$319 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$413 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$4 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$84 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$92 million
<b>Total Estimated Capital Costs</b>	<b>\$912 million</b>
<b>Refinement Option No. 3 – 50% Separation (East Area + Greensferry)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$365 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$369 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$4 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$84 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$84 million
<b>Total Estimated Capital Costs</b>	<b>\$906 million</b>
<b>Refinement Option No. 4 – 80% Separation (All but Downtown Urban Core)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$662 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$496 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$2 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$77 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$27 million
<b>Total Estimated Capital Costs</b>	<b>\$1,264 million</b>
<b>100% Separation (Separate Entire Combined Sewer Area)</b>	
• Sewer Separation (from City's Pre-design Consultant – assumes urban core = 2 times cost)	\$963 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$0 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$0 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$84 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$0 million
<b>Total Estimated Capital Costs</b>	<b>\$1,047 million</b>
<b>0% Separation (100% Tunnel Storage and Treatment System)</b>	
• Sewer Separation (from City's Pre-design Consultant)	\$0 million
• Tunnel Storage and CSO Pump Station and Treatment Facilities (Pre-design Report)	\$677 million
• De-chlorination at Existing CSO Facilities (Pre-design Report)	\$9 million
• Expansion to Intrenchment Creek WRC (from RMR – due to increased sanitary flow in East)	\$0 million
• Capacity Relief /Repairs to Existing Combined Sewers (from RMR – ratio of % of separation)	\$143 million
<b>Total Estimated Capital Costs</b>	<b>\$829 million</b>