ALTERNATIVES IMPACT COMPARISON						
	Land Use & Permitting	Environment	Technical	O&M	Cost-Effectiveness	Community Impact
CAG1 – Storage in Lincoln Park Parking Lot			✓(See Comment)		✓(See Comment)	✓
	COMMENTS: *Barton Pump Station upgrade would require an appreciably expanded footprint into the residential properties to the north. *This alternative has a high relative cost (3.0). *Major impacts on ferry traffic resulting from the larger scale of construction would need to be mitigated. May require marine access and/or temporary re-routing of ferry traffic to downtown Seattle to mitigate traffic and access impacts.					
CAG2 – Storage at Lincoln Park Colman Pool	✓					✓
CAG3 – Combine GSI with Additional Storage in Barton			✓(See Comment)			
	COMMENTS: * Alternative relies on GSI (roadside rain gardens and private property RainWise program) to reduce the size of storage at the bottom of the Murray basin from 1.0 MG to 0.6 MG. Additionally, the alternative relies on GSI to limit the peak Barton Pump Station flow rate to 22 mgd. Limiting flow from Barton is required in order to reduce the size of storage in Murray. If GSI is not effective or if private property participation is inadequate, the CSO control goal will not be reached because the storage facilities at the bottom of Barton and Murray basins will be undersized.					
CAG4 – Separate All Sewer and Stormwater Flows			✓(See Comment)			
	COMMENTS: * Alternative requires large-scale private property roof and impervious area disconnection from the combined sewer. Over 2,700 private property owners would be required to participate. If private property participation is not adequate, the CSO control goal will not be reached.					
CAG5 – Storage at Gatewood Elementary School			✓(Same as CAG #1)		✓(See Comment)	✓
	COMMENTS: *This alternative has a high relative cost (3.5).					
CAG6 – Barton Pump Station Pumps Directly to Alki			✓(Same as CAG #1)		✓(See Comment)	✓
	COMMENTS: *This alternative has a high relative cost (3.4).					
CAG7 – GSI in Murray to Reduce Storage Volume			✓(See Comment)			
	COMMENTS: * Alternative relies on GSI (roadside rain gardens and private property RainWise program) to reduce the size of storage at the bottom of the Murray basin from 1.0 MG to 0.71 MG. If GSI is not effective or if private property participation is inadequate, the CSO control goal will not be reached because the storage facilities at the bottom of the Murray basin will be undersized.					
CAG8 – Upper Basin Storage for Murray Peak Flows			✓(See Comment)			✓
	COMMENTS: *Upper basin storage volumes must be significantly oversized to achieve control at the bottom of the basin or complex control system would be required. The level of certainty in predicting the peak flow rates in upper-basin pipelines (and the corresponding required storage volumes to provide control) decrease as you move higher in the basin. The alternative would still require a large volume of storage at the bottom of the basin to control peak flows from the Barton Pump Station and the remaining uncontrolled CSO pipelines that discharge to the bottom of the Murray basin.					

ALTERNATIVES IMPACT COMPARISON

	Land Use & Permitting	Environment	Technical	O&M	Cost-Effectiveness	Community Impact
KC1A – Rectangular Storage at Bottom of Basin	✓					
	COMMENTS: *1.0 MG storage facility in or adjacent to Lowman Park may be located within the shoreline zone (if in park, City Council action would be required to allow for non-park use).					
KC1B – Circular Storage in Vicinity of Murray Ave. and Lincoln Park Way	✓(See Comment)					
	COMMENTS: *Pelly Creek flows through the project area and would be impacted by construction activities. The eastern portion of the project area has steep slopes and is identified by the City of Seattle as a potential landslide area. Permitting and land use restrictions may eliminate or restrict the ability to construct a facility at this site.					
KC1C – Distributed Storage Along Beach Drive and Murray Ave. SW **Not Technically Feasible**			✓(See Comment)			
	COMMENTS: *This alternative cannot be constructed as originally proposed. The pipes were to be installed using conventional open trench construction. Through further investigation it was determined that the pipe in Beach Drive would need to greater than 30-feet deep along much of the alignment, which is beyond the limits of open trench excavation methods in the type of geotechnical conditions that would be encountered.					
KC1D – Pipe Storage at Bottom of Basin by Tunneling			✓(See Comment)	✓(See Comment)		
	COMMENTS: *Tunneling will require construction of tunnel portals (up to 50-feet deep at the north end) at each end of the facility to launch and receive the tunnel boring machine. The existing ground conditions at the north end of Beach Drive present major slope stabilization risks during portal construction that may jeopardize surface improvements and buried utilities. These portals would remain as permanent buried structures under the roadway which would be used for facility access and maintenance. *Tunnel depth and roadway access would present major operations and maintenance challenges following construction.					
KC1E – Upper Basin Storage						
KC1F – Combined Pipe/Rectangular Storage at Bottom of Basin						
KC2A – Convey and Treat at Alki					✓(See Comment)	✓
	COMMENTS: *This alternative has a high relative cost (3.0). * This alternative involves construction of 13,500 feet of force main along beach drive. This will involve significant traffic impacts during construction affecting several neighborhood which use Beach Drive as a primary access route.					
KC3A – End of Pipe Treatment at Bottom of Basin	✓			✓	✓(See Comment)	
	COMMENTS: *28.5 MGD CSO treatment facility in or adjacent to Lowman Park may be located within the shoreline zone (If in park, City Council action would be required to allow for non-park use). *This alternative has a high relative cost (4.2).					
KC5A – Peak Flow Reduction Combined with Storage **Not Technically Feasible**			✓(See Comment)			
	COMMENT: *This alternative cannot be constructed as originally proposed. The Beach Drive storage pipe was to be installed using conventional open trench construction. Through further investigation it was determined that the storage pipe would need to be greater than 30-feet deep along much of the alignment, which is beyond the limits of open trench excavation methods in the type of geotechnical conditions that would be encountered.					

Explanation of Achievability Factors:

Land Use & Permitting: Is the proposed location of major infrastructure such as a storage facility or new peak flow pump station in a park "green space" which could permanently change the character and use? Will the alternative require approval by Seattle Parks Department and the City Council to satisfy Initiative 42 requirements? Due to the proposed location and scale of the facility, is it likely that if approvals were received from the City they would be appealed? (Note: This does not include temporary impacts due to construction.)

<If we answered yes to ANY of these questions, we applied a checkmark>
<If the proposed location was in a parking lot which could be restored, we did not apply a checkmark>

Environment: Will construction and operation of the alternative impact streams, wetlands or known archaeological/cultural resources such that implementation may not be accomplished within the required schedule?

<If we answered yes to ANY of these questions we applied a checkmark>

Technical: Does the alternative involve multiple facilities that must be significantly oversized in order to avoid a complex control logic to achieve the control requirements at the bottom of the basin? Does the alternative have a heavy reliance on roadside rain gardens or private property green stormwater infrastructure improvements such that a lack of voluntary participation would not achieve compliance at the bottom of the basin? Are the sizes of any storage facilities heavily reliant upon effective implementation of GSI on private property?

Does the alternative involve significant difficulties and risks to effectively construct the proposed facilities? This would involve major traffic impacts to facilities such as the Fauntleroy Ferry Terminal, marine construction access, major slope stability risks, or other considerable geotechnical risks such as with tunneling methods?

<If we answered yes to ANY of the questions as they may apply to an alternative, we applied a checkmark> <If we answered yes to any of the construction related questions and determined that the requirements may be too difficult to effectively mitigate, we applied a checkmark>

O&M: Will the facility configuration, including depth of construction, inhibit or prohibit operation access of the facility for maintenance during critical operation periods.

<If we answered yes to this question, we applied a checkmark>

Cost Effectiveness: Does the alternative have a high relative cost to the low-cost alternative? (i.e.) does the alternative have a relative cost greater than 3.0?

<If we answered yes to EITHER of these questions we applied a checkmark>

Community Impact: Is there a new set of stakeholders that would need to be engaged in protracted discussion of the alternative? And would these stakeholders most likely have a significant stakeholder position which would extend the schedule beyond the permit limits established by the Department of Ecology?

<If we answered yes to BOTH of these questions we applied a checkmark>