Attachment 19
Measurable Evaluation Process – Summary of Concept Screening

This attachment provides additional detail on the Measurable Evaluation Process that Enterprise Services used in developing optimized versions of the Managed Lake, Estuary, and Hybrid Alternatives that would best achieve project goals. Refer to Section 2.1 of the Draft Environmental Impact Statement (EIS) for additional background on the Measurable Evaluation Process.

The Measurable Evaluation Process evaluated the range of discrete concepts and alternative variations that had been proposed by governmental and agency partners and the community through past planning processes and through the scoping period at the beginning of the EIS in 2018. Refer to Section 3.5 of the Scoping Report provided as Attachment 20 of this Draft EIS for a more detailed description of the range of concepts proposed during scoping. The Measurable Evaluation Process also reviewed previous variations of the alternatives, as proposed in the Environmental Impact Statement prepared for the Capitol Lake Adaptive Management Plan (CLAMP) Steering Committee in 1998 and 1999, the CLAMP Alternatives Analysis and Deschutes Estuary Feasibility Study (DEFS) in 2009, and Phase 1 of the Capitol Lake – Deschutes Estuary Long-Term Management Planning. These previous documents are available at the project website: https://capitollakedeschutesestuaryeis.org.

In coordination with Enterprise Services, the known range of concepts were screened by the EIS Project Team composed of civil engineers, environmental engineers, coastal engineers, geomorphologists, water quality specialists, biologists, limnologists, economists, and planners. This screening occurred over a series of workshops in early 2019. Concept screening was the first step of a three-step process (refer to Figure 1).

Table 1 provides the evaluation criteria used by the EIS Project Team in the concept screening. Tables 2 through 4 are the summary results and overall concept ratings for the Managed Lake, Estuary, and Hybrid Alternatives, respectively.

Concepts selected for the optimized alternatives were advanced for further review in the Draft EIS. A full description of the Managed Lake, Estuary, and Hybrid Alternatives that were developed through this process can be found in Section 2.2 of the Draft EIS. Concepts not selected for inclusion in optimized alternatives were not carried forward for evaluation in the Draft EIS.

Importantly, Tables 2 through 4 represent results of screening completed at the beginning of the Draft EIS and represent preliminary findings. As the analysis was completed, technical and regulatory feasibility ratings may have changed. The Measurable Evaluation Process is intended to be iterative and responsive, as needed, to findings of the EIS Project Team. The Managed Lake, Estuary, and Hybrid Alternatives can be modified during or after the Draft EIS to better meet the project purpose and goals.

Figure 1 Measurable Evaluation Process for the Environmental Impact Statement

1998 – 2018

All concepts and alternative variations identified in past processes, Phase 1, and EIS Scoping

2019

Step 1. Optimize Alternatives

- Evaluate and screen concepts and components of alternative variations:
  - Feasibility (technical & regulatory)
  - Sustainability (environmental & economic)
- Develop optimized versions of the Managed Lake, Estuary, and Hybrid Alternatives using the objective evaluation criteria

Outcome: Optimized versions of the alternatives that are feasible and most sustainable advance into the EIS technical analyses

2020

Step 2. Evaluate and Compare Alternatives

- Evaluate potential impacts and benefits of each alternative using results of the technical analyses
- Measure alternatives against discipline-specific significance criteria
- Present results in the Draft EIS for review by governmental partners, agencies, and the community

Outcome: Comparative summary of the impacts and benefits of the alternatives

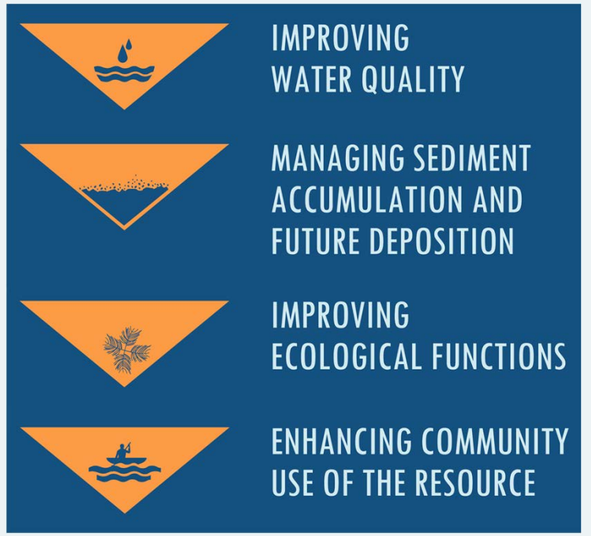
Draft EIS Issued 2021

Draft EIS Public Comment Period and Mtg

2021 & 2022

Step 3. Identify a Preferred Alternative

- Evaluate the alternatives relative to their performance against project goals, other potential impacts and benefits, and environmental and economic sustainability



- Review and consider public comment on the Draft EIS
- Identify Preferred Alternative in Final EIS

Outcome: Identification of a Preferred Alternative that best meets the project purpose and goals

Final EIS Issued 2022

Table 1
Evaluation Criteria used in Step 1 of the Measurable Evaluation Process

Evaluation Criteria	Definition and Screening Scale
Technical Feasibility	**A component is considered technically feasible (1) if there are no apparent technical or logistical obstacles that would prevent the component from being constructed and maintained and (2) if there is technical uncertainty, it is at an acceptable level based on current, standard engineering practices.** **High =** Appears to be technically feasible. **Medium** = May be technically feasible; potential technical or logistical obstacles identified. **Low =** Has an unacceptable level of technical uncertainty.
Regulatory Feasibility	**A component is considered to have regulatory feasibility if (1) permits and approvals could be secured within project schedule and budget and (2) it is within Enterprise Services' jurisdiction to implement and there are no legal protections on land, or other similar restrictions that could affect the feasibility.[2]** **High =** Appears to have regulatory feasibility. **Medium** = May have regulatory feasibility; potential permitting obstacles or restrictions identified. **Low =** Has regulatory uncertainty.
Environmental Sustainability	**A component would support an environmentally sustainable outcome if it would provide net environmental benefits over a 30-year horizon, considering relative contribution to project goals.** **High =** Appears to provide the most environmental benefits relative to the other potential approaches. **Medium** = Appears to provide moderate environmental benefits relative to the other potential approaches. **Low =** Appears to provide the fewest environmental benefits relative to the other potential approaches. **Unknown** = Only proposed approach; cannot be rated relative to other potential approaches.
Economic Sustainability	**A component will support an economically sustainable outcome if it would be cost-effective in meeting the project goal. A proposed approach is considered cost-effective if its present value life-cycle costs over a 30-year time horizon are low relative to other proposed approaches within the same project component.** **High =** Appears to be most cost-effective in achieving the project goal relative to the other potential approaches. **Medium** = Appears to be moderately cost-effective in achieving the project goal relative to the other potential approaches. **Low =** Appears to be least cost-effective in achieving the project goal relative to the other potential approaches. **Unknown** = Only proposed approach; cannot be rated relative to other potential approaches.
Overall Rating	**High =** Achieved the highest rating and no low ratings. **Medium =** Received a mixture of high and medium ratings, and/or one low rating. **Low** = Received two or more low ratings, and/or the lowest rating overall.
Selected for Optimized Alternative and Further Evaluation in the EIS	**Yes =** Selected based on results of the evaluation. **No =** Not selected based on results of the evaluation.

Notes:

1. If a component is not technically or regulatory feasible, and/or is not environmentally or economically sustainable, it will not advance further in the evaluation.
2. The Technical Work Group was consulted, as needed, to determine regulatory feasibility.

Table 2
Screening Summary for the Managed Lake

GOAL: WATER QUALITY

Active Water Quality Management

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Mechanized plant harvesting in Middle Basin	CWMP, Nutrient Harvesting	**High**	**High**	**Medium/Low**	**High**	**High**	**Yes**	• Active water quality management is most consistent with project goals compared to passive water quality improvements. • Mechanical plant harvesting is a feasible and reasonable strategy to include in an adaptive management plan, pending the water quality objectives identified with the Technical Work Group. • Mechanical plant harvesting is commonly used to maintain aesthetics (narrative water quality standards) in Puget Sound lowland lakes. • There is no upfront cost and the approach to plant removal can be adaptable.

GOAL: SEDIMENT MANAGEMENT

Dredging Summary

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Initial and maintenance dredging in North basin only	CWMP, Managed North Basin Lake/Wetland, CLAMP EIS Lake/River Wetland without Trap, CLAMP EIS Lake/River Wetland with Trap	**High**	**High**	**High**	**High**	**High**	**Yes**	• This is most environmentally and economically sustainable compared to other approaches to sediment management.

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Initial and maintenance dredging in North and Middle basins	CLAMP Managed Lake, CLAMP EIS Lake	**Medium/Low**	**Low**	**Low**	**Low**	**Low**	No	• The only identified benefit of dredging in the Middle Basin would be to provide additional reflecting area. This would reduce the environmental and economic sustainability compared to other sediment management approaches. • Existing trees and vegetation limit reflecting within the Middle Basin, and any water surface would provide a degree of reflecting. • If sediment dredged during construction is reused in the Middle Basin to create habitat and the Middle Basin transitions to freshwater wetlands over time, dredging in the Middle Basin becomes more technically challenging and adverse to the ecological goals in this area.
Maintenance dredging in Budd Inlet and Middle Basin	Managed North Basin Lake/Wetland	**High**	**Low**	**Low**	**Low**	**Low**	No	• Budd Inlet would not be impacted by sediment deposition under the Managed Lake Alternative, compared to existing conditions, so maintenance dredging in Budd Inlet would not be in response to a project need. • Relative to dredging in the North Basin only, dredging in the Middle Basin only would provide less benefit because it is not the primary reflecting pool, it is a better location to establish shoreline habitat, and does not have adjacent park spaces to support boat launching like the North Basin.

Dredged Material Disposal

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
In-water disposal	CLAMP Managed Lake	**Low**	**Low**	**Low/Medium**	**Medium**	**Low**	No	• Sediment cannot be disposed of in another waterbody because of the high-density of invasive species and the risk of spreading these invasive species. • The regulatory agencies have provided clear guidance that sediment dredged from Capitol Lake cannot be disposed of in-water.
Upland disposal (reclamation site, landfill)	CLAMP Managed Lake	**High**	**High**	**Low**	**Low**	**Low**	**Yes, as needed**	• Relative to all other sediment management options, disposing of the material at a permitted upland location is the least environmentally and economically sustainable option. • Cost associated with dewatering, transportation and disposal are very high. • If sediment is reused within Capitol Lake to the maximum amount feasible, upland disposal for the remaining sediment would be the remaining viable option.
Beneficial upland reuse (construction fill, landscaping)	CLAMP Managed Lake, Expanded Park Space, CWMP	**Medium/Low**	**Medium**	**Medium**	**Low/Medium**	**Medium**	No	• Sediment is geotechnically unsuitable for use as construction fill without significant additives or amendments. • The handling and stockpile associated with diverting small amounts to landscaping would add costs and reduce economic viability of this option. • The sediment would have to be treated for invasive species prior to reuse.

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Reuse in-water for habitat- or other improvements within the basin	CLAMP Managed Lake, Expanded Freshwater Wetlands	**Medium/High**	**High**	**High**	**Medium**	**High**	**Yes**	• Relative to all other sediment management options, reusing within the Capitol Lake Basin is the most environmentally and economically sustainable. This would reduce project costs by hundreds of millions. • Sediment could be reused during construction to create habitat areas, similar to what occurred during past dredging events in Capitol Lake where sediment was placed at the south end of the Middle Basin (present day Interpretive Center) and wetland habitat has been created.

Additional Dredging Considerations

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Install permanent hydraulic dredge system on nearby state-owned parcel and dewater material on nearby state-owned land	CWMP, Managed North Basin Lake/Wetland	**Medium**	**Low**	**Low**	**Low**	**Low**	No	• A large amount of power would be needed for the hydraulic pump. • A large area would be needed to dewater sediment, requiring land lease and stockpile location adjacent to Capitol Lake, potentially in the shoreline district. • Hydraulic dredge would have to be located within a shoreline park, reducing available recreational space. • Ongoing equipment maintenance would be needed on the hydraulic dredge, especially given its use in areas of dense aquatic vegetation. • The soonest that recurring maintenance dredging would begin is 2040 and these variables cannot be accurately predicted at this time.

GOAL: ECOLOGICAL FUNCTIONS

Invasive and Nuisance Species Management

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Control of noxious weeds and Eurasian watermilfoil	CLAMP Managed Lake	**High**	**High**	**High**	**High**	**High**	**Yes**	• This is a feasible and reasonable strategy to include in an adaptive management plan to support ecological function. • The assumption is that complete eradication of all aquatic invasive species under a Managed Lake is not feasible but that active management should be implemented. • Managing nuisance and invasive species is consistent with agency expectations, and aquatic plant management will support goals of improved water quality. • There is no upfront cost.

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Continued Canada geese management	CLAMP Managed Lake	**High**	**High**	**Medium**	**High**	**Medium**	No	• This would be implemented upon request from the regulatory agencies. • Existing control practices are not highly effective. Overall net benefit for ecological functions is not great enough to include in the optimized alternative.
Intermittent lake drawdown and backflushing	CLAMP Managed Lake, CLAMP EIS – Lake, CLAMP EIS – Lake/River Wetland With Trap, CLAMP EIS – Lake/River Wetland Without Trap	**High**	**Low**	**Low**	**High**	**Low**	No	• The regulatory agencies have asked that lake drawdown and backflushing be discontinued because the intermittent introduction of saltwater affects aquatic species and overall ecology of Capitol Lake. • Backflushing has not proven to be highly effective in managing populations of the New Zealand mudsnail. • This could be implemented upon request from the regulatory agencies, but such a request is unlikely.

Freshwater Wetlands

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Retain existing wetlands in South Basin and along shoreline (maintain open water in Middle and North Basins)	CLAMP Managed Lake, Managed North Basin Lake/Wetland, CLAMP EIS – Lake	**High**	**Medium**	**Low**	**High**	**Medium**	No	• Relative to a concept that would allow the Middle Basin to transition to freshwater wetlands, this does not perform as well against project goals.
Transition South and Middle basins to managed wetland	CWMP, Phase 1 - Managed North basin Lake/wetland, Expanded Freshwater Wetlands, CLAMP EIS – Lake/River Wetland Without Trap, CLAMP EIS – Lake/River Wetland With Trap, CLAMP EIS – Lake	**High**	**High**	**High**	**Medium**	**High**	**Yes**	• Increasing freshwater wetlands in the project area would improve water quality and ecological functions. This is most consistent with project goals. • This is the most environmentally and economically sustainable approach to improving ecological function (and can be paired with a sediment management approach that reuses initial construction dredge material in the Middle Basin).

Onsite Ecological Restoration

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Removal of railroad/berm at West Bay with ecological restoration	CWMP	**Medium**	**Low**	**Low**	**Low**	**Low**	No	• This is a primary component of a separate project that is under evaluation by the City of Olympia. • Relative to other opportunities to improve ecological function, this would not achieve project goals within the project area under Enterprise Services' management purview. • The Squaxin Island Tribe is a key stakeholder in the separate evaluation of restoration opportunities at the West Bay railroad berm and their recommendation will be influential in the decision making by resource agencies.
Estuary restoration at south end of East Bay	CWMP	**Medium**	**Low**	**Low**	**Low**	**Low**	No	• Relative to other opportunities to improve ecological function, this would not achieve project goals within the project area under Enterprise Services' management purview. • This area is being considered for potential clean-up under a separate environmental process.
Placement of large woody debris and log jams in Percival Creek	CWMP	**High**	**Medium**	**High**	**High**	**Medium**	No	• The ecological value of this concept is highly dependent on the location of the large woody debris and engineered log jams. • To provide meaningful ecological uplift, it is assumed that the material would have to be placed further upstream, beyond the area under Enterprise Services' management purview (which is ends near Percival Cove) and outside of the project area.
Placement of large woody debris in South and Middle Basins	CLAMP EIS – Lake/River Wetland Without Trap	**High**	**High**	**High**	**High**	**High**	**Yes, pending feedback from regulatory agencies during permitting**	• Placement of large woody debris in the South and Middle Basins is a feasible and reasonable strategy to include in a Habitat Enhancement Plan, pending feedback from the regulatory agencies, if selected as the Preferred Alternative. • This would complement an overall approach to transition the South and Middle Basins to freshwater wetlands. • Relative to placement outside of the project area (i.e., upstream in Percival Creek), this would better improve ecological function in the project area.
Rechanneling of Percival Creek mouth to Budd Inlet	CWMP	**Low**	**Low**	**Low**	**Low**	**Low**	No	• This concept would require a high degree of engineering and project funding, for potentially low ecological value within the project area. • Relative to other concepts that could restore ecological function within the project area, this is not the most economically sustainable.

GOAL: COMMUNITY USE

Recreational Opportunities In & Around Lake

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
No swimming beach	CLAMP Managed Lake	**High**	**High**	**?**	**High**	**High**	**Yes**	• Following consultation with Enterprise Services, it was determined that hosting formal swimming facilities is not within their agency mission. However, efforts to improve water quality would not preclude another entity, like a park's department, from negotiating a lease with the State of Washington to construct and run a swimming beach. This would not be prohibited or precluded as a result of the project. • The City of Olympia operated the former swimming area at Heritage Park.
Swimming beach in North Basin	CWMP	**Medium**	**Low**	**?**	**Low**	**Low**	No	• Relative to the restoration of other active uses (i.e., fishing and boating), formal swimming facilities and associated operations and maintenance would have the highest upfront and ongoing costs. • Prioritizing secondary contact opportunities is the best use of project funds.

Additional Recreational Considerations

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
New boardwalk extension north of 4th Avenue Bridge	CWMP	**Medium**	**Low**	**Low**	**Low**	**Low**	No	• This is not within Enterprise Services' management purview and would not achieve project goals within the project area. • This may conflict with restoration goals for West Bay that are being evaluated in a separate City-led process.
New trail (portage route) under the 4th Avenue Bridge, to Middle Basin, potentially to Tumwater Falls	CWMP	**Medium**	**Low**	**Low**	**Low**	**Low**	No	• Relative to other concepts that provide new uses (i.e., boardwalks for over-water enjoyment), this does not introduce a new recreational element into the project area. • Much of this extension would be outside of Enterprise Services' management purview and outside of the project area.
Expanded park space in North Basin	Expanded Park Space	**Low**	**Low**	**Low**	**Low**	**Low**	No	• This concept would fill the majority of the North Basin to provide play fields. • The proposal would have a high level of environmental impact and therefore would not be approved by the regulatory agencies. • This concept would not achieve the other project goals related to water quality, ecological function and sediment management.

Abbreviations:
CLAMP = Capitol Lake Adaptive Management Plan
CWMP = Community Waterfront Management Plan
Phase 1 = Phase 1 of the Capitol Lake – Deschutes Estuary Long-Term Management Planning

Table 3
Screening Summary for the Estuary

GOAL: WATER QUALITY

Active Water Quality Management

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Construction of a 500-foot opening at 5th Avenue	CLAMP Estuary	**High**	**High**	**High**	**Medium**	**High**	**Yes**	• This would remove the full 5th Avenue Dam (the concrete spillway and earthen dam) and would best support project goals. It is also most compatible with an estuary restoration alternative. • This opening size is consistent with modeling performed by the Washington State Department of Ecology. • Regulatory agencies and tribes have advocated for this larger opening.
Remove 80-foot tide gate to restore tidal flow	CLAMP EIS – Estuary	**Medium**	**Low**	**Low/Medium**	**High**	**Medium**	**No**	• This would not improve water quality or ecological functions as well as a 500-foot opening. • Narrower openings would increase velocities, resulting in greater need for scour protection and associated infrastructure costs. • Regulatory agencies and the tribes have advocated for the larger opening.
Lowering and raising of a reconstructed dam to allow flushing (seasonally or daily)	Phase 1 – Temporal	**Medium/Low**	**Low**	**Low**	**Low**	**Low**	**No**	• This does not meet the purpose or intent of an estuary alternative and it is reasonable to assume that it would not be supported by the regulatory agencies or tribes. • The regulatory agencies have prohibited drawdown and backflushing practices since 2004 because the intermittent introduction of saltwater affects aquatic species and overall ecology of Capitol Lake. Similar impacts are expected to occur under this concept. • This would not measurably improve ecological functions within the project area, which is a project goal. • This would require a high level of operations and maintenance to adjust the tide gates in accordance with the daily tidal fluctuations. • This option would lead to the most significant dam overhaul given the increased use. • Scour protection would need to be placed throughout the basin.

GOAL: SEDIMENT MANAGEMENT

Dredging Summary

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Initial dredge of the main channel within Capitol Lake basins; maintenance dredging downstream	CLAMP Estuary	**High**	**High**	**High**	**Medium**	**High**	**Yes**	• This is most consistent with the project goal of managing sediment. It also avoids potentially significant impacts associated with sediment transport.
No initial dredging; maintenance dredging within Lower Budd Inlet at maturity	CLAMP EIS – Estuary	**High**	**Low**	**Low**	**Low**	**Low**	No	• The project must demonstrate avoidance and minimization for potential significant impacts to the federal navigation channel in West Bay. The project would not likely receive approval by the U.S. Army Corps of Engineers under Section 408 of the Rivers and Harbors Act if initial dredging was not performed to reduce the initial flush of sediment into West Bay. • If maintenance dredging did not occur until estuary maturity, the marinas in West Bay would be significantly impacted from sediment deposition. • No initial dredging could lead to channel migration because it would not be trained to a general alignment. • Under this concept, beneficial reuse of dredge material to construct shoreline habitat and increase ecological diversity within the project area would not be possible.

Dredged Material Disposal

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
In-water disposal	CLAMP Estuary	**High**	**Low/Medium**	**Low/Medium**	**High**	**Medium**	**Yes**	• Sediment dredged during construction cannot be disposed of in another waterbody because of invasive species and the risk of spreading these invasive species. • In-water disposal is feasible for sediment dredged from West Bay during maintenance dredging if the invasive species have not persisted in the saltwater environment and chemical quality is suitable. Sampling would be required before dredging to confirm suitability for in-water disposal.
Upland disposal (reclamation site, landfill)	CLAMP Estuary	**High**	**High**	**Low**	**Low**	**Low**	**Yes, as needed**	• Relative to all other sediment management options, disposing of the material at a permitted upland location is the least environmentally and economically sustainable option. • Cost associated with dewatering, transportation and disposal are very high. • If sediment is reused within Capitol Lake to the maximum amount feasible, upland disposal for the remaining sediment dredged during construction would be the remaining viable option.

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Reuse in-water for habitat- or other improvements (habitat creation, armoring of Deschutes Parkway)	CLAMP Estuary	**M/High**	**High**	**High**	**Medium**	**High**	**Yes**	• Relative to all other sediment management options, reusing within the Capitol Lake Basin is most environmentally and economically sustainable. This would reduce project costs by hundreds of millions. • Sediment could be reused during construction to create habitat areas, similar to what occurred during past dredging events in Capitol Lake where sediment was placed at the south end of the Middle Basin (present day Interpretive Center) and wetland habitat has been created. • Sediment could also be reused to stabilize Deschutes Parkway.

GOAL: ECOLOGICAL FUNCTIONS

Invasive and Nuisance Species Management

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Control of noxious weeds and Eurasian watermilfoil	CLAMP Estuary	**High**	**High**	**High**	**High**	**High**	**Yes**	• This is a feasible and reasonable strategy to include in an adaptive management plan to support ecological function. • Managing nuisance and invasive species is consistent with agency expectations, though reduced populations of aquatic invasive species are assumed under the Estuary Alternative. • There is no upfront cost.
Continued Canada Geese management	CLAMP Estuary	**High**	**High**	**Medium**	**High**	**Medium**	No	• This would be implemented upon request from the regulatory agencies. • Existing control practices are not highly effective. Overall net benefit for ecological functions is not great enough to include in the optimized alternative.

Onsite Ecological Restoration

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Natural formation of sand bars in Middle and North basins	CLAMP EIS – Estuary	**Medium**	**High**	**High**	**High**	**Medium**	**Yes**	• Some dredging should be assumed to train the channel, and this can mimic the historic estuary environment. • Following the initial construction dredging, allowing the estuary to function naturally (rather than continuing to dredge in the basin) would be the most environmentally and economically sustainable option.
Creation/transition shoreline of South and Middle basins to estuarine wetlands and intertidal saltmarsh habitat	CLAMP Estuary	**High**	**High**	**High**	**High**	**High**	**Yes**	• This is most consistent with project goal to improve ecological function. • Beneficially reusing sediment dredged during construction to create this habitat would reduce project costs significantly compared to offsite disposal.

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Protection of existing freshwater wetlands in the South basin limiting saltwater mix, potentially through construction of a retaining wall	Phase 1 – Expanded Freshwater Wetlands	**Low/Medium**	**Medium/Low**	**Low**	**Low**	**Low**	No	• This does not meet the purpose or intent of an estuary alternative and it is reasonable to assume that it would not be supported by the regulatory agencies or tribes. • Based on the previous modeling effort, salinity is expected to be low in the South Basin and it is likely that freshwater wetlands would persist, to some degree.

GOAL: COMMUNITY USE

Recreational Considerations

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Reconfigure trail connection around North Basin due to new intersection at Deschutes Parkway and 5th Avenue	CLAMP Estuary	**High**	**High**	**High**	**High**	**High**	**Yes**	• The need for a reconfigured or new trail around the North Basin will be dependent on the width of the opening. • With a 500-foot opening, a reconfigured trail would be a reasonable measure to avoid impacts to an important existing recreational feature in the project area.
Construct boardwalks at existing parks to elevate/maintain existing trails	CLAMP Estuary	**High**	**High**	**High**	**Medium**	**Medium**	**Yes**	• Elevating existing trails with new boardwalks is a reasonable measure to avoid impacts to existing recreational opportunities and enhance recreational use within the project area. • The extent and location of boardwalks will be further evaluated by the EIS Project Team.

Abbreviations:
CLAMP = Capitol Lake Adaptive Management Plan
Phase 1 = Phase 1 of the Capitol Lake – Deschutes Estuary Long-Term Management Planning

Table 4
Screening Summary for the Hybrid

GOAL: WATER QUALITY

Active Water Quality Management

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Provide freshwater to constructed reflecting pool (Reclaimed water from LOTT, Deschutes River, groundwater)	CLAMP EIS – Combined Lake/Estuary, DELI	**Low**	**Low**	**Medium**	**Low**	**Low**	No*	• Relative to a saltwater reflecting pool, a freshwater reflecting pool is more technically challenging and there may be concerns from the regulatory agencies regarding this use. • Freshwater does not achieve the project goals better than saltwater since swimming facilities are not assumed for the alternatives. • Active management is assumed for a freshwater reflecting pool, similar to active management that would be required under a Managed Lake Alternative. This would be less environmentally and economically sustainable than a saltwater reflecting pool that would not require management. • There is a high degree of uncertainty about whether the freshwater concept could pass the public interest test that would be applied by the Washington State Department of Ecology in order to secure the non-consumptive water rights. There is not a similar regulatory step for saltwater. • It is unlikely the agencies allow water to be pumped from the Deschutes River given the significant concern over water quantity. • There are technical challenges associated with pumping freshwater from the Deschutes River, such as, the amount of sediment that would be carried with the water. Pumping water from the Deschutes River would likely be the least environmentally and economically sustainable of the freshwater options. • Constructing a saltwater reflecting pool does not preclude a later transition to freshwater if determined to be feasible. Though, a freshwater concept is only assumed to be preferred if formal swimming is introduced by a separate entity.
Circulate saltwater within reflecting pool	CLAMP Dual-Basin Estuary	**High**	**Medium**	**Medium**	**High**	**High**	**Yes**	• This is a feasible and reasonable strategy to include in an adaptive management plan to maintain water quality. • This could be achieved through a tide gate configuration that allowed for daily flushing.

GOAL: COMMUNITY USE

Recreational Considerations

Proposed Approach	Alternatives & Concepts	Technical Feasibility	Regulatory Feasibility	Environmental Sustainability	Economic Sustainability	Overall Rating	Selected for Optimized Alternative	Primary Findings from Screening
Approximately 40-acre reflecting pool	CLAMP Dual-Basin Estuary, CLAMP EIS – Combined Lake/Estuary	**High**	**Low**	**Low**	**High**	**Low**	No	• Relative to a 48-acre reflecting pool, this would provide less recreational space. • The straight barrier wall in this concept is expected to be less aesthetically pleasing than a curved configuration in the larger reflecting pool.
Approximately 48-acre reflecting pool	DELI	**High**	**Low**	**High**	**Medium**	**Medium**	**Yes**	• This would provide more recreational space than the 40-acre concept. • The circumference for the walking trail would be approximately one mile, which may complement the existing walking opportunities around the North Basin.
Sheet pile containment wall with pedestrian walkway	CLAMP Dual-Basin Estuary	**High**	**Low**	**Medium**	**High**	**Medium**	**Yes**	• A sheet pile containment wall would best support a pedestrian trail, which would support the project goal of enhancing recreational opportunities. • Pile driving associated with sheet pile installation is a primary impact of this option and the regulatory agencies will require measures to reduce noise. • Textured concrete panels could be affixed to a sheet pile wall to provide habitat benefits and visual appeal. • Relative to an extensive rock containment wall, sheet pile is expected to be less expensive.
Rock containment wall with pedestrian walkway	DELI	**Medium**	**Low**	**Medium**	**Low**	**Low**	No	• A rock containment wall would have a larger footprint and would result in the most amount of fill within waters of the U.S., compared to other options, such as sheet pile. This would present significant regulatory challenges. • The potential habitat benefits are not expected to offset the large area of fill.

Notes:

The alternative components shown here are those that are unique to the Hybrid Alternative – specifically, to address the reflecting pool. The estuarine side of the Hybrid Alternative would be consistent with the Estuary Alternative; refer to that outcome summary (provided in Table 3 of this Appendix) for additional detail regarding the components that would be implemented to best meet project goals.

*The freshwater reflecting pool concept was not selected for the Optimized Hybrid Alternative; however, this concept was carried forward into the EIS evaluation as a potential option and went through additional feasibility review. Refer to Appendix E of the Water Quality Discipline Report for a detailed evaluation, and in applicable sections of Chapter 4 for summary discussion.

Abbreviations:
CLAMP = Capitol Lake Adaptive Management Plan
DELI = Dual Estuary/Lake Idea