


KING COUNTY AUDITOR'S OFFICE

SEPTEMBER 30, 2021

Presentation of Clean Water Plan Strategies: Need for Increased Transparency around Costs, Risks, and Guiding Principles

The King County Wastewater Treatment Division (WTD) is at a critical juncture in development of the Clean Water Plan (CWP) as it prepares to develop its preferred strategy for billions of dollars in future wastewater investments. We reviewed WTD's presentation of Actions and strategies to policy-makers and identified a lack of transparency about the risk that some strategies being considered may not meet current and future regulatory requirements, a lack of clear project cost information, and an absence of clarity in guiding principles that could leave optimal strategies off the table.

In this letter, we describe our observations and suggest questions policy-makers may ask WTD to resolve before a preferred strategy is presented for adoption. These questions are provided in blue callout boxes at the end of each section and in Appendix 1.

Policy-maker opportunity to provide input on Clean Water Plan development

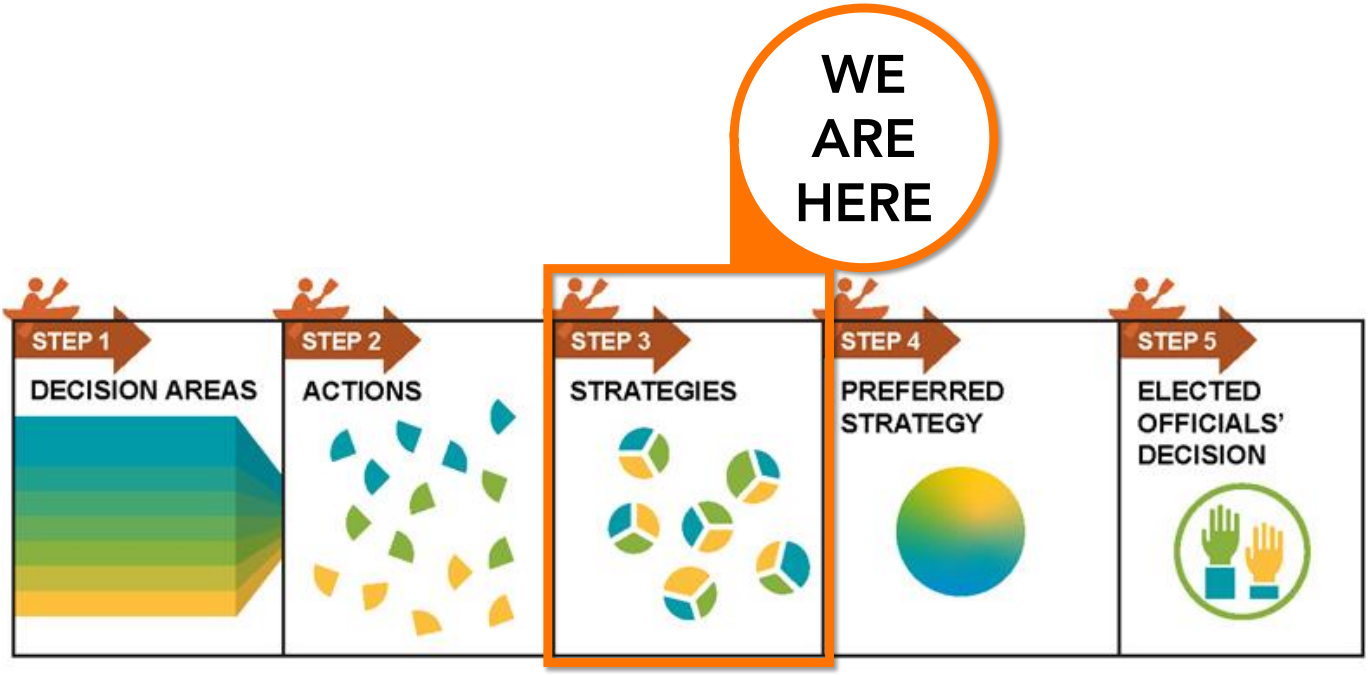
King County policy-makers currently have an opportunity to weigh options and ask questions about the strategies proposed by WTD for how the County prioritizes and spends billions of dollars on wastewater facilities and water quality investments over the next 40 years. These wastewater investments will directly impact monthly base rates and capacity charges as well as water quality throughout the region.

Development of the CWP is a five-step process, illustrated in exhibit A, below. In step 2, WTD identified Actions[1] that King County could implement, ranging from wastewater treatment plant upgrades to enhanced source control programs. WTD is currently in step 3—Strategy Development and Analysis—where WTD has grouped selections of Actions into five strategies that represent different approaches to wastewater investment. WTD now has initial strategies and has presented them to policy-makers for discussion and feedback. After the conclusion of the current step, the County Executive will select a preferred strategy and refer a proposal to the Regional Water Quality Committee for both its review and the recommendation to transmit it to the King County Council for adoption.

[1] WTD summarized these Actions in its *Actions: Characterizing Water Quality Investment Options* (2021) report.

King County

EXHIBIT A: Development process for Clean Water Plan.



Source: King County Auditor's Office modified graphic from Wastewater Treatment Division Clean Water Plan.

Some WTD strategies may not be viable under current and potential future regulations

WTD is asking policy-makers to affirm whether the range of strategies presented should proceed to evaluation without clear information from WTD on how external conditions could affect the feasibility of the proposed strategies and component Actions. By exploring different strategies, policy-makers can discuss and weigh priorities, such as ensuring rate affordability and maximizing water quality improvement. However, wastewater conveyance and treatment are highly regulated, and regulatory decisions, both current and future, can have significant impacts that limit the range of feasible options. For these discussions to be meaningful, and to effectively inform decision-making, policy-makers must have clear information about each strategy's viability in the wastewater regulatory environment and how both WTD assumptions and federal and state regulations could affect strategy feasibility. Without this information, policy-makers may find themselves choosing a strategy which is not viable under current or future regulations, risking the imposition of wastewater investment decisions by regulatory agencies and losing control over rates.

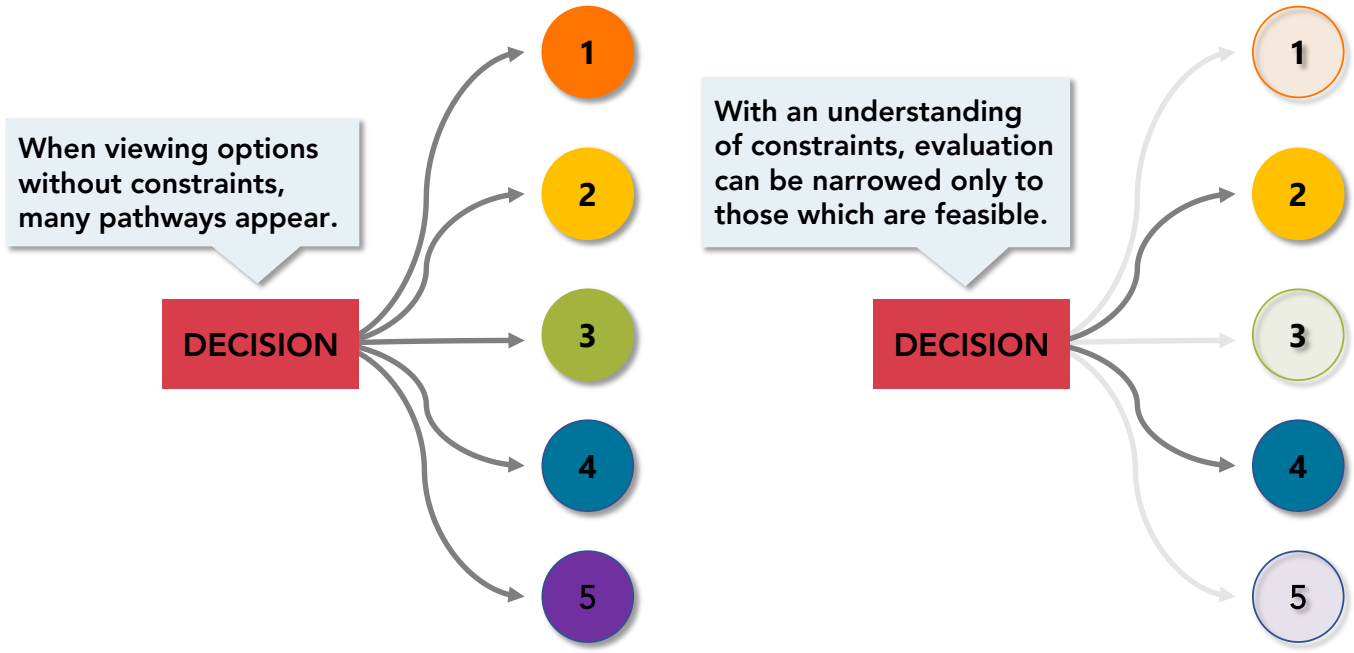
Additionally, if WTD does not analyze strategies against current and future regulatory considerations, plans for plant expansion could be at risk. Based on the 2019 *Treatment Plant Flows and Loadings Study Summary Report*, King County's largest wastewater treatment plants (WWTP)—Brightwater, South Plant, and West Point—are at or expected to exceed design parameters[2] and require expansion or facility re-

[2] All three facilities are expected to exceed max month influent loading for Total Suspended Solids (TSS) and 5-day Biological Oxygen Demand (BOD_5) within the planning period. According to the 2019 *Treatment Plant Flows and Loadings Study Summary Report* West Point is already near the maximum month influent levels. South Plant is expected to reach max month loading between 2025 and 20230, and Brightwater is expected to reach maximum month loading between 2020 and 2023.

rating[3] to serve forecasted demand growth in the region. As part of the plant expansion process, WTD will need to modify each facility's National Pollutant Discharge Elimination System permit, at which time the public—including tribal and non-governmental organizations—will have the opportunity to weigh in and could oppose changes on the basis of the WWTPs by applying all known, available, and reasonable methods of prevention, control, and treatment. If this were to occur, WTD may find that it cannot meet the needs of new growth, leading to a moratorium on new service connections.

Modeling the impact of regulatory outcomes on various strategies by WTD will help ensure policy-makers are considering viable strategies, that they understand the impacts of regulatory outcomes on consumer rates, and ensure plants are able to serve growth in the region. Moreover, it can help the County create a roadmap of alternatives should a crucial assumption prove false.

EXHIBIT B: Evaluating constraints, such as regulatory changes, allows policy-makers to focus only on feasible plans of action.



Source: King County Auditor's Office.

The five strategies proposed by WTD are unlikely to be feasible given current expectations around future regulatory outcomes. Regulatory uncertainty comes largely from two areas, both related to federal Clean Water Act compliance: King County's consent decree with the US Environmental Protection Agency (EPA) for combined sewer overflows (CSO) and the Puget Sound Nutrient Source Reduction Program. These

[3] Re-rating is a process by which a plant's design parameters (Flow, Total Suspended Solids, Biological Oxygen Demand) are modified without making capital improvements. Facility expansion is the process of adding infrastructure to the plant to support higher design parameters.

regulations can dictate the range of feasible Actions within two of the highest cost decision areas identified by WTD: wastewater treatment[4] and wet weather management.[5]

EXHIBIT C: Federal and state regulatory decisions may make many of the strategies proposed by WTD infeasible.

SCENARIO	Existing consent decree; no nitrogen limits issued	Modified consent decree; no nitrogen limits issued	Modified consent decree; nitrogen loading set at current levels	Existing consent decree; nitrogen loading set at current levels	Nitrogen loading set at 8mg/L equivalent	Nitrogen set at 3mg/L equivalent
STRATEGIES PROPOSED BY WTD	A	A	A	A	A	A
	B	B	B	B	B	B
	C	C	C	C	C	C
	D	D	D	D	D	D
	E	E	E	E	E	E

Source: King County Auditor's Office analysis of WTD strategies as presented to the Regional Water Quality Committee on July 7, 2021.

None of the strategies presented by WTD[6] would result in a nitrogen reduction within the range of nutrient loading limits likely to be set by the Department of Ecology (DOE).[7] WTD has identified

[4] The wastewater treatment decision area cost will vary based upon actions selected for implementation, but is estimated by WTD to have a cost at most optimistic between $710 million to $27.7 billion. WTD states conceptual capital cost estimates are provided with an accuracy of most optimistic to plus 150%.

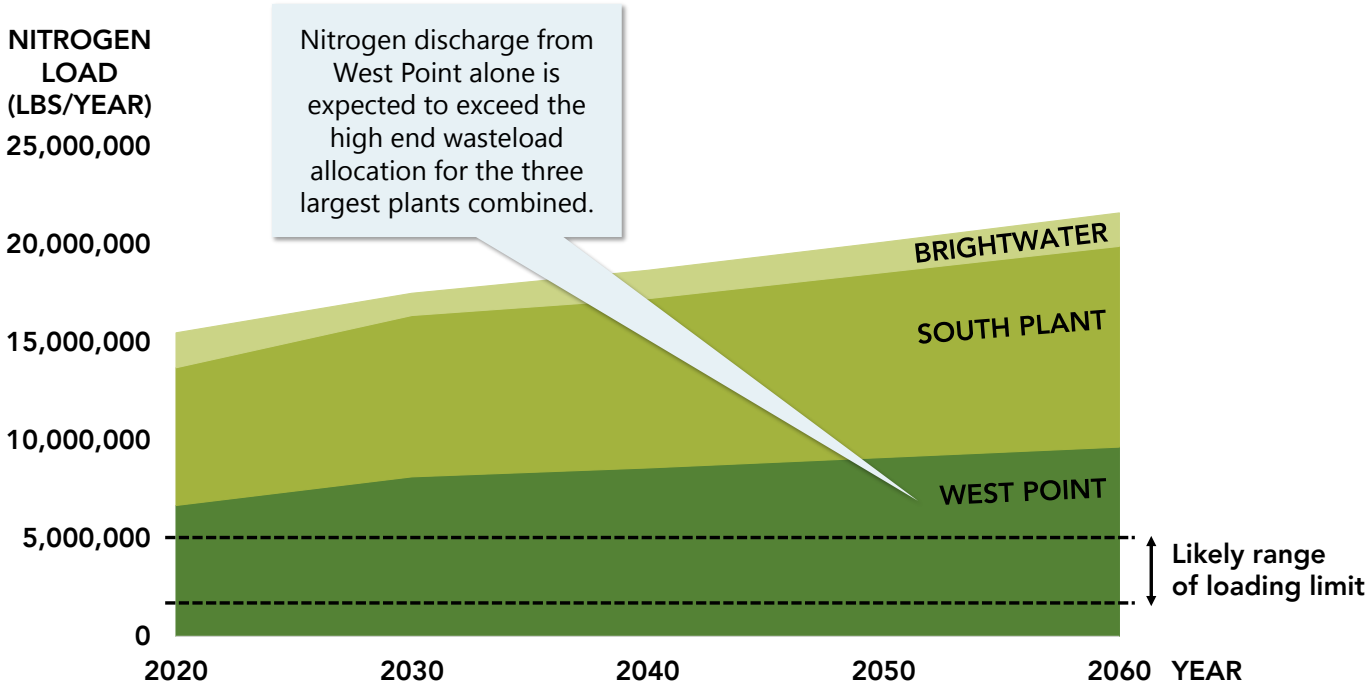
[5] The wet weather management decision area cost will vary based upon actions selected for implementation, estimated by WTD to cost, at most optimistic, between $3.3 billion and $20 billion in conceptual capital. WTD states conceptual capital cost estimates are provided with an accuracy of most optimistic to plus 150%.

[6] Strategy A, as presented to date by WTD in *Actions: Characterizing Water Quality Investment Options* (2021), proposes individual nitrogen reduction at each regional WWTP at 8mg/L.

[7] The Puget Sound Nutrient Source Reduction Program (PSNSRP) is a Department of Ecology (DOE) program to develop a nutrient reduction plan and accompanying wasteload allocations for anthropogenic sources of nitrogen within the Puget Sound watershed. While wasteload allocations are in development, DOE plans on issuing the first Puget Sound Nutrient General Permit (PSNGP) effective January 1, 2022, which will set action levels for municipal wastewater treatment plants that directly discharge to Puget Sound. These action levels are based upon historical nitrogen loading and were set with the goal of preventing nitrogen loading to Puget Sound from increasing from current levels. For jurisdictions like King County with multiple plants, the most recent draft permit allows a jurisdiction to choose to either use a bubbled action level for all three plants, allowing flexibility for improved nitrogen treatment at one plant to offset nitrogen increases at another, or individual plant action levels. In the second permit cycle, the PSNGP will set a nitrogen-loading limit, in pounds per year (lb/yr), for King County's wastewater treatment plants (WWTP). The wasteload allocation is not a concentration-based limit. If an 8mg/L effluent limit on nitrogen achieves the required loading limit in the second permit cycle, future growth in the service area will require further nitrogen removal efforts or a decrease in effluent volume to Puget Sound (i.e., through

wastewater treatment plant improvements and decentralized approaches[8] that may result in a nitrogen reduction within the likely range of outcomes, but this approach is not presented as a wholistic strategy to demonstrate what compliance with potential nitrogen limits would require. Exhibit D, below, shows nitrogen loading under various scenarios, with bars representing the lower and higher range of wasteload allocations currently being modeled by DOE.

EXHIBIT D: Without significant reductions, King County will not comply with potential future nutrient limits developed by the Department of Ecology.



Projected Wastewater Treatment Plant Nitrogen[9] Loading at Existing Treatment

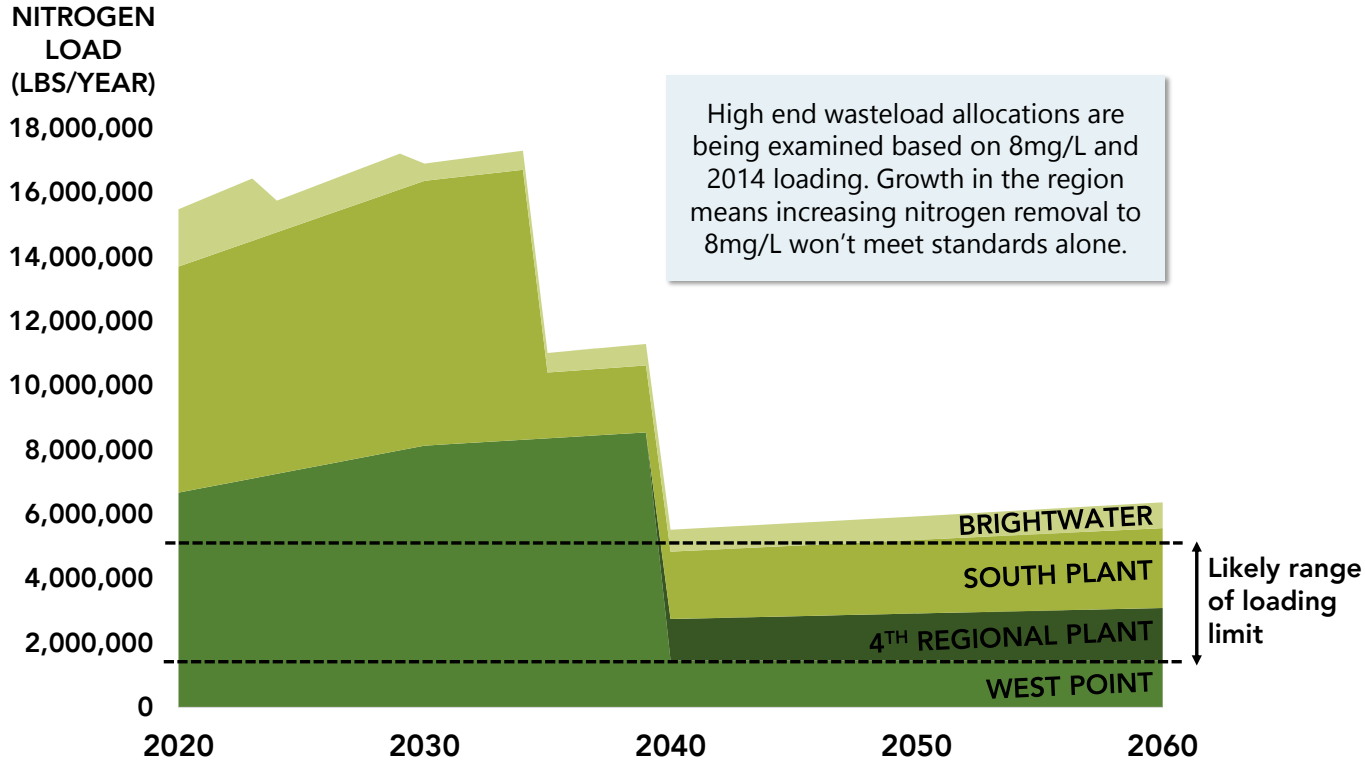
Source: King County Auditor's Office analysis of data from WTD Priority 1 question responses dated August 16, 2021, Brown and Caldwell *King County Nitrogen Removal Study: Final Report,* September 2020, *Brightwater Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, *South Plant Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, *West Point Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, and Department of Ecology Salish Sea Year 2 Modeling Inputs provided August 2021.

aquifer recharge or indirect potable reuse) in order to maintain the same nitrogen-loading level. DOE is currently modeling scenarios that evaluate water quality improvements based upon different nitrogen reduction scenarios. For King County's plants, these scenarios range from nitrogen-bubbled loads of approximately 11 to 33 percent of 2020 levels (wasteload allocation range of 1,690,010 lbs/yr to 5,076,150 lbs/yr). It is, therefore, reasonable to assume the wasteload allocation for King County's WWTPs will be in this range.

[8] These approaches included building scale decentralized treatment, secondary treatment at wet weather treatment stations, implementation of treatment upgrades to achieve 8mg/L TIN at West Point and 3m/L at South Plant and Brightwater, and advanced treatment and beneficial use of South Plant effluent.

[9] Where the word nitrogen is used in the report, it means total inorganic nitrogen or TIN.

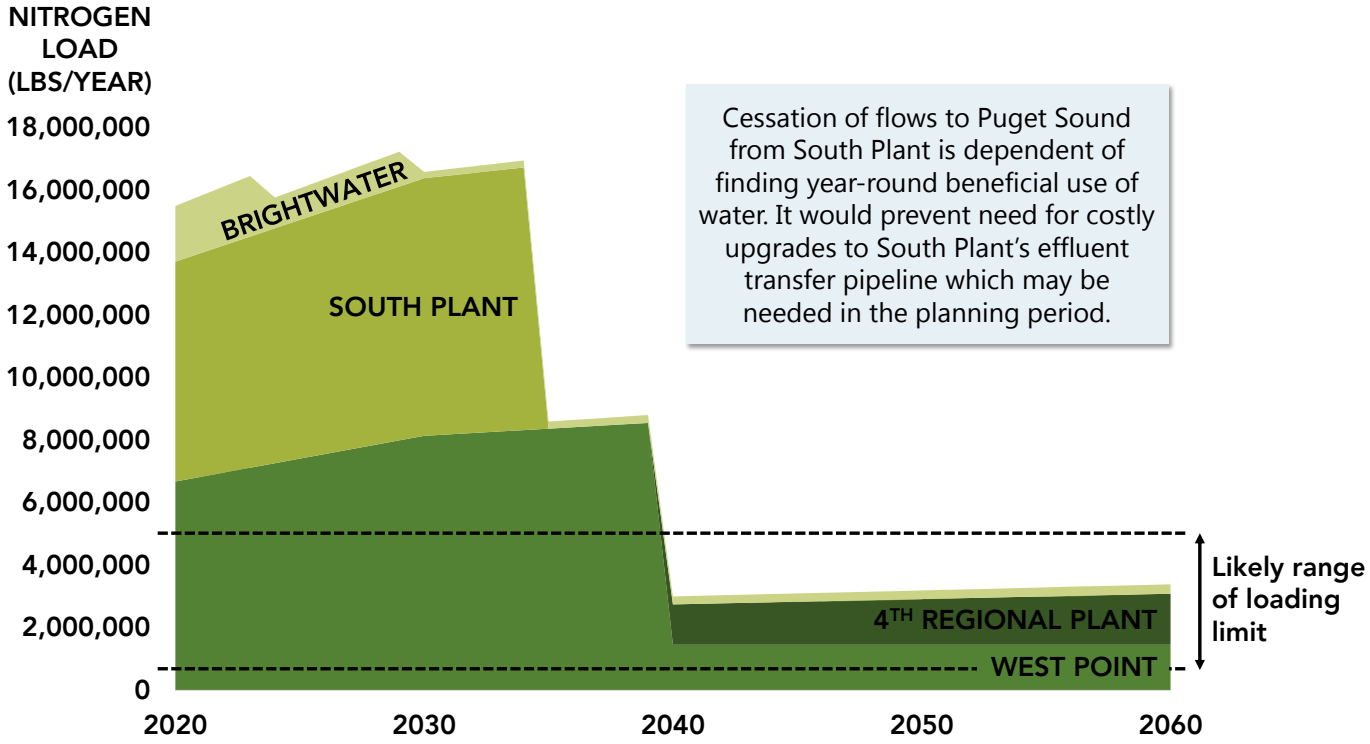
EXHIBIT E: Even the most aggressive wastewater treatment plant reductions proposed may not meet likely nutrient limits developed by the Department of Ecology.



Projected Wastewater Treatment Plant Nitrogen Loading Per Year with Treatment Upgrades to 8mg/L Effluent Nitrogen Concentration (Strategy A)

Source: King County Auditor's Office analysis of data from WTD Priority 1 question responses dated August 16, 2021, Clean Water Plan Advisory Group Meeting #10 Briefing Document, *Actions Characterizing Water Quality Investment Options,* May 2021, Brown and Caldwell *King County Nitrogen Removal Study: Final Report,* September 2020, *Brightwater Treatment Plant Peak Flow and Wasteload Projects 2010-2060*, January 2019, *South Plant Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, *West Point Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, and Department of Ecology Salish Sea Year 2 Modeling Inputs provided August 2021. This assumes one regional facility is upgraded every five years, starting in 2030.

EXHIBIT F: WTD has identified wastewater treatment improvements which may meet likely nutrient limits developed by the Department of Ecology, but they are not presented by any Action, or within any strategy.



Projected Wastewater Treatment Plant Nitrogen Loading Per Year Treatment Upgrades to 8mg/L Effluent at West Point, 3m/L at Brightwater, and Full Reuse of South Plant Effluent

Source: King County Auditor's Office analysis of data from WTD Priority 1 question responses dated August 16, 2021, Brown and Caldwell, *Actions Characterizing Water Quality Investment Options,* May 2021, *King County Nitrogen Removal Study: Final Report,* September 2020, *Brightwater Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, *South Plant Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, *West Point Treatment Plant Peak Flow and Wasteload Projects 2010-2060,* January 2019, and Department of Ecology Salish Sea Year 2 Modeling Inputs provided August 2021.

Given the magnitude of discharge from King County's WWTPs, compliance with strict nutrient limits set by DOE is likely to require significant capital investments at the regional WWTPs. King County's WWTPs contribute 57 percent of the total nitrogen loading to Puget Sound from domestic wastewater treatment plant marine point discharges. In the best-case scenario—meaning highest expected wasteload allocation—King County would be expected to reduce nitrogen loading by 67 percent compared to 2020 levels. Decentralized treatment at wet weather treatment stations and building-scale decentralized treatment can produce significant reductions in marine nitrogen. However, even at the most optimistic range, these reductions are only approximately 37 percent of the reductions needed, and at least optimistic only 9 percent. While non-point trading has been discussed, WTD has determined non-point trading is not a feasible option to pursue to offset improvements at wastewater treatment plants because a large amount of land is needed. Additionally, trading can only occur once water quality-based limits are set, meaning any reductions needed in the first permit cycle must occur at the WWTPs.

Four of five WTD strategies assume a successful modification of the existing consent decree, extending the timeline for compliance by 30 years—an unlikely outcome given current EPA guidance.[10] King County's consent decree requires all CSO locations to be under control by December 31, 2030. In 2019, WTD requested the consent decree be renegotiated with an extended compliance timeline to 2040. While the status of the negotiations is not public due to confidentiality agreements, four of the five strategies include a renegotiated consent decree compliance timeline of 2060, effectively proposing a 47-year compliance timeframe. The EPA consent decree compliance tracking spreadsheet, dated 2017, shows average compliance timeframe for CSO and/or sanitary sewer systems consent decrees at an average of 15 years. Therefore, it is likely that negotiations may not lead to an extended compliance timeframe of 2060. If King County is unsuccessful in renegotiating the consent decree, then strategies B-E would no longer be viable, as they all assume renegotiation of the compliance timeline to 2060.

Two WTD strategies assume an approach that would require a change to Washington Administrative Code. Strategies C and D indicate the method for CSO compliance is "extended CSO Control Program timeline and/*or alternative water quality investments*"[11]. Policy-makers should be aware there is no existing regulatory framework that would allow King County to pursue alternative water quality investments in lieu of controlling CSOs. Such a change would require an amendment to the Washington Administrative Code, which requires achievement of the greatest reasonable reduction of CSOs, defined as "control of each CSO in such a way that an average of one untreated discharge may occur per year[12]".

Questions for policy-maker consideration:

- What are the risks of an unsuccessful renegotiation of the consent decree, and what would be the impact on rates?
- What are the risks of not planning for implementation of nutrient removal, including how it might affect WTD's ability to serve new connections?
- What regulatory outcomes are required for each strategy and/or action to be viable?
- Are there examples and lessons learned from other jurisdictions in the United States, where broad regulatory changes, such as those proposed by WTD, were sought and achieved?

Lack of transparency obscures cost differences between Actions

The packaging of projects into Actions and the presentation of cost and benefits at the Action level, rather than the project level, obscures details about the costs and benefits of each Action's component projects making it more difficult for decision-makers to effectively weigh options. For example, there are two Actions proposed for compliance with the consent decree: Current CSO Long-Term Control Plan (LTCP) Implementation and Extended CSO Control Implementation (exhibit G, below). In the *2021 Actions* Report, which provides cost estimates on a high-level Actions basis, an extended LTCP implementation results in a conceptual capital cost savings of $1.1B–2.6B—when compared to

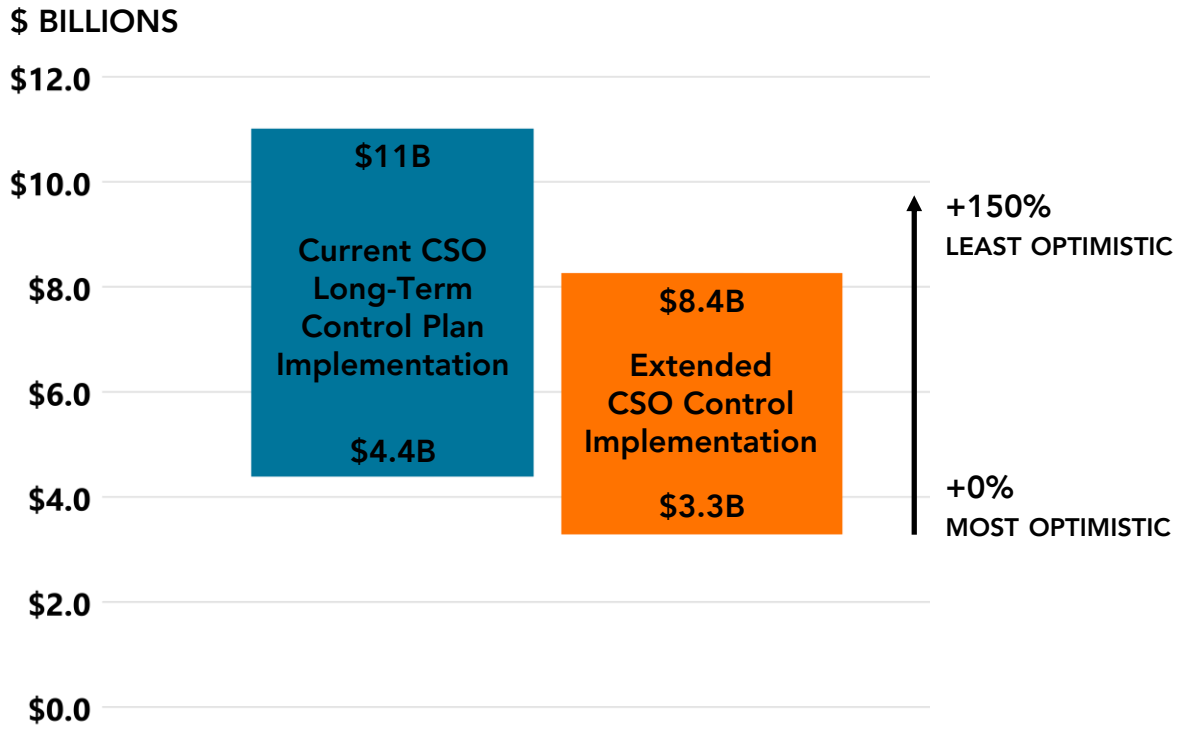
[10] *Environmental Protection Agency Combined Sewer Overflows — Guidance for Financial Capability Assessment and Schedule Development,* February 1997, and *Memorandum on Financial Capability Assessment Framework for Municipal Clean Water Act Requirements,* November 2014.

[11] Emphasis added

[12] WAC 173-245-020 (22)

current LTCP implementation.[13] The majority of the difference in capital cost ($980M–2.5B) is the result of a 30 percent acceleration fee, which WTD presents as the premium for delivering the remaining LTCP within ten years. However, it is unclear why this 30 percent markup is included on supplemental compliance, which would occur after 2033 and alone contributes 20 percent to the increased conceptual capital cost when compared to the extended CSO control implementation timeline. Additionally, it is unclear why the consent decree compliance project costs continue to grow at such a fast pace. In a 2019 letter to the EPA, WTD stated the remaining consent decree compliance projects would be expected to cost $1.9B or more, depending on alternative chosen and timeline. In the most recent cost estimates provided by WTD, the remaining projects now have a lowest, most optimistic conceptual capital cost of $2.94B,[14] an increase of nearly 55 percent.[15]

EXHIBIT G: **Presentation of costs on Action-level basis obscures differences in costs.**



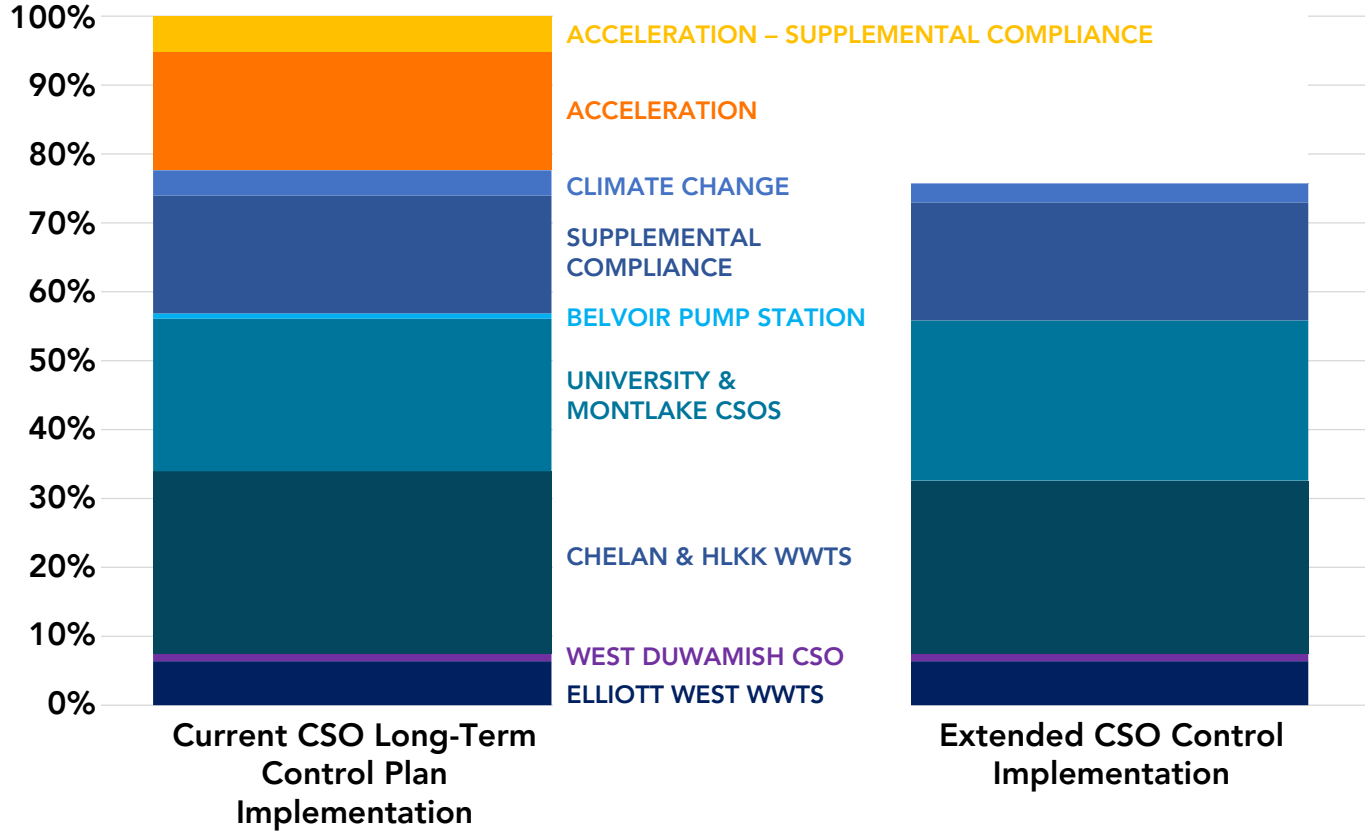
Source: WTD Priority 1 question responses, dated August 26, 2021

[13] Comparisons made here are based upon the low-end range. WTD has presented its estimates as conceptual program planning estimates with a range of lowest, most optimistic to +150%.

[14] 2020 nominal dollars. Conceptual cost estimates are provided by WTD with a range of lowest, most optimistic, to +150%.

[15] This represents the conceptual capital costs presented by WTD for Duwamish CSO Storage Tank (West Michigan St. and Terminal 115), CSO Storage Tank near Chelan Ave. Regulator Station, HLKK WWTS, University Storage Tank, and Montlake CSO Storage Tank with the five percent climate change, and 30 percent acceleration factor.

EXHIBIT H: Difference in conceptual capital costs between current and extended CSO control implementation is due mostly to acceleration factor.

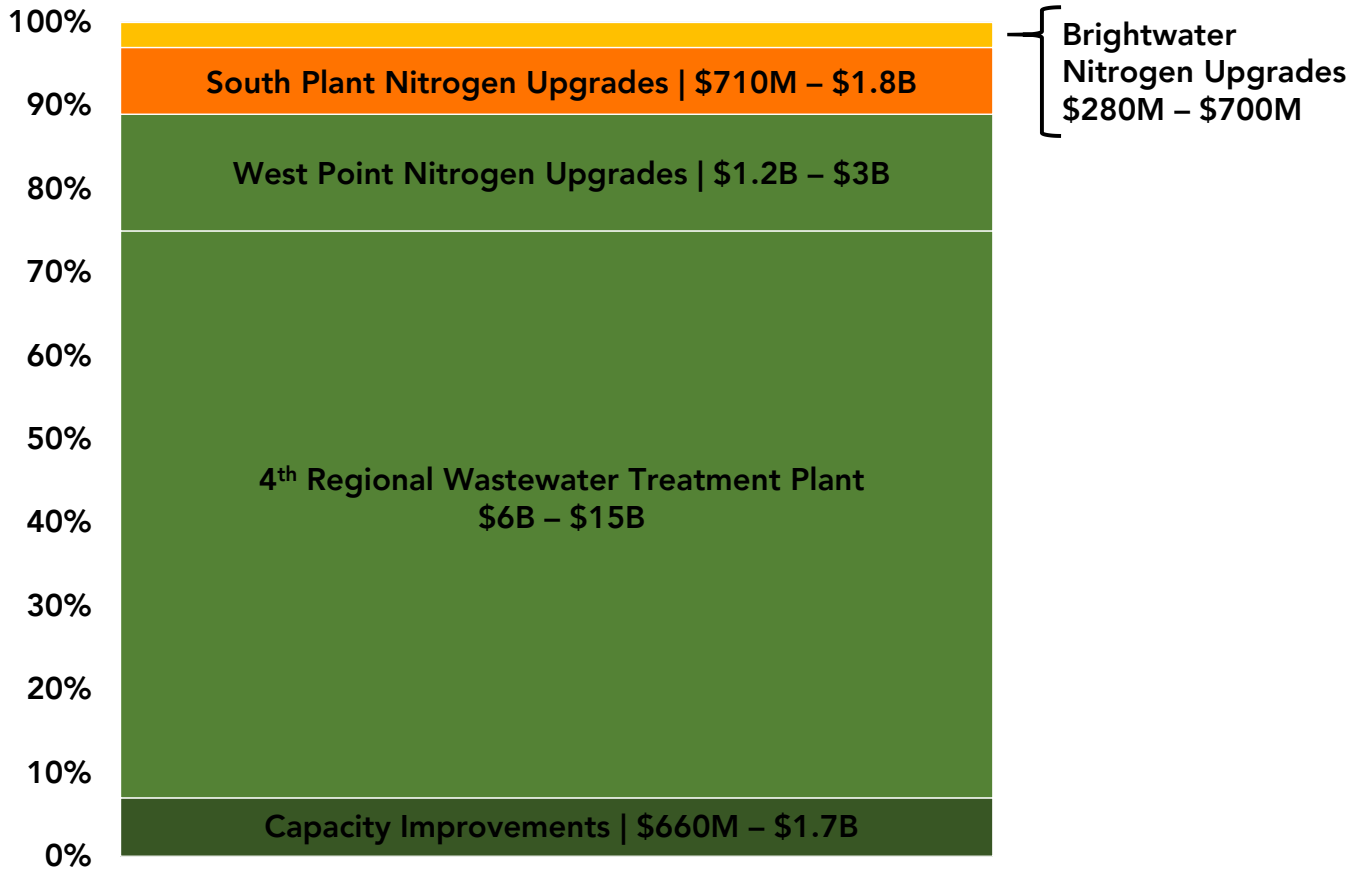


Source: WTD Priority 1 question responses, dated August 26, 2021

Similarly, the grouping of WWTP upgrades obscures the cost of upgrades at each individual plant. Grouping the projects as packages without providing a cost breakdown may make it appear that WWTP improvements are an expensive method to achieving nitrogen reductions. Viewing a detailed breakdown provides a more nuanced view and shows improvements at some plants can lead to big benefits for a fraction of the total Action cost. Exhibit I, below, shows of the needed $8.9B–$22B estimated by WTD to achieve individual nitrogen levels at each WWTP, $7.2B–$18B in capital costs are related to nitrogen removal at West Point, while only $990M–$2.5B in conceptual capital costs would be required to achieve nitrogen levels of 8mg/L at both South Plant and Brightwater. Implementing these upgrades at South Plant and Brightwater would result in a reduction of nitrogen loading at King County's WWTPs by 43 percent for a conceptual capital investment of $990M–$2.5B.[16]

[16] WTD presented its estimates as conceptual program planning estimates with a range of lowest, most optimistic to +150%.

EXHIBIT I: Implementing nutrient removal improvements[17] at South Plant and Brightwater represents only 11 percent of the cost of individual plant nitrogen reduction.



Source: WTD Priority 1 question responses dated August 26, 2021.

Questions for policy-maker consideration:

- What are the costs of projects within individual Actions?
- Are there alternative ways projects could be grouped to improve outcomes at a lower cost?

Strategies may not ensure the best water quality outcome

The best water quality outcome may not be represented in WTD's strategies, making it difficult for decision-makers to facilitate the best outcomes. According to the Office of Performance, Strategy and Budget, review of the strategies will include an assessment against the 2020–2025 Clean Water Health Habitat Strategic Plan. However, determination of achievement of the best water quality outcome at the lowest cost can only occur if all Actions are carefully considered by WTD. For example, Urban Growth Area (UGA) On-Site Septic System (OSS) Conversion, Regional Stormwater Facilities Program, and Regional Stormwater Retrofits are the only Actions with meaningful freshwater phosphorus reductions. Phosphorus has been identified by King County as the pollutant most frequently leading to "potentially toxic cyanobacteria blooms, reduction in water clarity, and odors and surface scums associated with nuisance

[17] The capital cost to achieve 8mg/L year-round effluent concentrations.

levels of algae"[18] in local lakes. UGA OSS Conversion results in higher phosphorus reductions than all three stormwater treatment options combined. However, UGA OSS Conversion does not appear in any of the five strategies presented by WTD, while Regional Stormwater Facilities Program and Retrofit appear in two (strategies C and D).

EXHIBIT J: Urban Growth Area On-Site Septic System Conversion provides significantly greater phosphorus removal (lb/yr) than other Actions, but is not considered as part of any strategy.

	Freshwater Phosphorus (lb/yr)		King County Costs[19]	
Actions	**Low**	**High**	**Low**	**High**
Urban Growth Area On-Site Septic System Conversion	1,700	40,000	$940,000,000	$2,360,000,000
Expanded Stormwater Treatment at Existing Wastewater Facilities	100	410	$230,000,000	$580,000,000
Regional Stormwater Facilities Program	350	1,400	$3,560,000,000	$9,000,000,000
Regional Stormwater Retrofit Program	630	2,500	$1,500,000,000	$3,800,000,000

Source: Freshwater phosphorus reductions are as provided in the 2021 *Actions* Report. King County costs were calculated by the King County Auditor's Office.

The screening lens WTD used to select Actions can also unnecessarily limit the range of projects under consideration. For example, City-Scale Decentralized Treatment limits screening of satellite wastewater facilities to those "where conveyance capacity limitations have been identified… or where significant future development has been identified."[20] However, satellite facilities could be located along areas of existing development and transmission mains and without these two limitations. This would create beneficial water reuse opportunities higher up in the sewershed, eliminating costly long transmission lines from South Plant, and reduce nitrogen discharges to Puget Sound. Additionally, satellite treatment could provide flow reductions to regional wastewater treatment plants, similar to decentralized building-scale treatment, without the safety concerns and potential de-incentivization of industry/commercial business growth in the county that decentralized building-scale treatment faces.

[18] King County (2017) *2016 Freshwater water quality* https://kingcounty.gov/services/environment/data-and-trends/indicators-and-performance/kingstat/2016/indicators/aquatic-environment/fresh-water-quality.aspx

[19] King County costs are calculated as conceptual capital, operations and maintenance, and repair and replacement less revenue and avoided costs in nominal 2020 dollars.

[20] King County Wastewater Treatment Division, *Actions: Characterizing Water Quality Investment Options,* 2021

Question for policy-maker consideration:

- What are WTDs goals for the Clean Water Plan and how do those align with yours?
- To what extent did WTD consider water quality benefits in its development of Actions and strategies?

Conclusion

The Clean Water Plan will guide how billions of public dollars are invested over the next 40 years. By evaluating non-viable strategies and Actions, instead of a range of actionable ones that meet anticipated regulatory requirements, King County risks selecting a sub-optimal strategy that does not meet regulatory requirements, provide the lowest possible rates, or deliver the best water quality outcome. Greater clarity around regulatory constraints and project costs, along with inclusion with a wider range of strategies would increase the probability of determining the optimal approach for the future of King County's wastewater system.

Zainab Nejati, PE, Principal Capital Analyst, conducted this review. Please contact Zainab at 206-263-1692 if you have any questions about the issues discussed in this letter.

Acknowledgments

We wish to thank the Department of Natural Resources and Parks, the Wastewater Treatment Division, and the Clean Water Plan team for their cooperation with this review and provision of timely information.

Appendix 1

Questions to Wastewater Treatment Division for policy-makers to consider

This appendix consolidates the questions laid out in our Clean Water Plan management report, which policy-makers may wish to ask as they explore the water quality investments options and deliberate on what Actions should be evaluated as part of the Clean Water Plan strategies.

- What are the risks of an unsuccessful renegotiation of the consent decree, and what would be the impact on rates?
- What are the risks of not planning for implementation of nutrient removal, including how it might affect WTD's ability to serve new connections?
- What regulatory outcomes are required for each strategy and/or action to be viable?
- Are there examples and lessons learned from other jurisdictions in the United States, where broad regulatory changes, such as those proposed by WTD, were sought and achieved?
- What are the costs of projects within individual Actions?
- Are there alternative ways projects could be grouped to improve outcomes at a lower cost?
- What are WTDs goals for the Clean Water Plan and how do those align with yours?
- To what extent did WTD consider water quality benefits in its development of Actions and strategies?

Appendix 2

Conceptual Program Planning Estimates for Combined Sewer Overflow (CSO) Program Wet Weather Management Actions

Breaking down costs by project shows the difference in the projects and costs between the two programs. Projects here are grouped by CSO locations.

CSO Program — Current CSO Long-Term Control Plan Implementation		CSO Program — Extended CSO Control Implementation	
CONCEPTUAL PROGRAM PLANNING ESTIMATES (2020 DOLLARS)			
Project	**Total Project Cost Range**	**Project**	**Total Project Cost Range**
Elliott West Wet Weather Treatment Station (WWTS)	$280,000,000–$700,000,000	Elliott West Wet Weather Treatment Station (WWTS)	$280,000,000–$700,000,000
West Duwamish CSO Storage Tank (West Michigan St. and Terminal 115)	$48,000,000–$120,000,000	West Duwamish CSO Storage Tank (West Michigan St. and Terminal 115)	$48,000,000–$120,000,000
CSO Storage Tank near Chelan Ave. Regulator Station	$210,000,000–$520,000000	Chelan Hanford Lander Kingdome King Street (CHLKK) CSO WWTS	$1,100,000,000–$2,800,000,000
Hanford Lander Kingdome King Street (HLKK) Wet Weather Treatment WWTS	$950,000,000–$2,400,000,000		
University Storage Tank	$600,000,000–$1,500,000,000	Consolidated CSO Tunnel for University and Montlake	$880,000,000–$2,200,000,000
Montlake CSO Storage Tank	$370,000,000–$930,000,000	Opportunistic ROW and Flow Separation in Montlake Basin: Interlaken Park Creek	$10,000,000–$25,000,000

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CSO Program comparison table, continued			
Project	**Total Project Cost Range**	**Project**	**Total Project Cost Range**
		Opportunistic ROW and Flow Separation in Montlake Basin: Alley Creek	$57,000,000–$140,000,000
		System Optimization (University Regulator Gate Setpoint Modification)	$72,000,000–$180,000,000
Belvoir Pump Station Overflow Storage	$34,000,000–$85,000,000	System Optimization (Belvoir Pump Station Modification)	$250,000–$630,000
Supplemental compliance: potential future operational and capital measures to maintain control given anticipated climate change conditions	$750,000,000–$1,900,000,000	Supplemental compliance: potential future operational and capital measures to maintain control given anticipated climate change conditions	$750,000,000–$1,900,000,000
		Programmatic Green Stormwater Infrastructure (GSI) for CSO Reduction (GSI Retrofit Partnership Program)	$2,100,000–$5,300,000
Climate Change Factor (5%)	$160,000,000–$400,000,000	Climate Change Factor (5%)	$120,000,000–$300,000,000
Acceleration Factor (30%)	$980,000,000–$2,500,000,000		
Total (40-year)	**$4,400,000,000–$11,000,000,000**	**Total (40-year)**	**$3,300,000,000–$8,400,000,000**

Advancing Performance & Accountability

MISSION

Promote improved performance, accountability, and transparency in King County government through objective and independent audits and studies.

VALUES

INDEPENDENCE - CREDIBILITY - IMPACT

ABOUT US

The King County Auditor's Office was created by charter in 1969 as an independent agency within the legislative branch of county government. The office conducts oversight of county government through independent audits, capital projects oversight, and other studies. The results of this work are presented to the Metropolitan King County Council and are communicated to the King County Executive and the public. The King County Auditor's Office performs its work in accordance with Government Auditing Standards.

NON-AUDIT

NON-AUDIT: This letter is not an audit as defined in Generally Accepted Government Auditing Standards, but conforms to office standards for independence, objectivity, and quality.