



Advisory Group Meeting #7 Briefing Document

Introduction

This briefing document provides Advisory Group members with the background information needed to engage in discussions at the September 9, 2020 Clean Water Plan Advisory Group Meeting. The objectives for the meeting are to:

- Learn about the comments provided during the State Environmental Policy Act (SEPA) scoping period and share thoughts on working with the comments in the planning process towards a regional water quality investment strategy
- Review a sample of preliminary findings from action development and analysis, including notable systemwide impacts and analytical challenges, and provide feedback on how the preliminary findings perform as a basis for informing the region on investment outcomes and, ultimately, water quality investment decision making
- Discuss key questions or information needed to frame strategies to inform community interests during the next phase of the planning process

For a graphical representation of the planning process, and its relationship to the Advisory Group meeting topics, visit Attachment A: Clean Water Plan Activities & Advisory Group Meeting Topics. As discussed at Meeting #6, the Clean Water Plan alternative investments exploration process will include two steps: first, an evaluation of potential actions and, second, an evaluation of alternative strategies.

Overview of SEPA Scoping Comments

King County Wastewater Treatment Division (WTD) invited the public to comment on the scope of the Clean Water Plan and the upcoming programmatic environmental impact statement (EIS) through a SEPA scoping process that occurred from May 20 to July 19, 2020 (including an extension). The SEPA scoping notice described seven decision areas (called “issues” in the notice) that the alternatives in the EIS will address, namely:

- Regional wastewater treatment plants
- Capacity in regional sewer pipes and pumps
- Aging sewer system, natural disasters, and climate change
- Recycling resources from wastewater
- Stormwater and combined sewer overflows (CSOs)
- Pollution reduction issues preventing pollution at the source
- Pollution from historical activities

During scoping, WTD received a total of 368 different comments during the scoping period. Of this number, 25 comments were submitted directly via mail or email from organizations, groups of organizations, and individuals; and the remaining 343 comments were received via a form letter. The commenters represented many interested parties in the region, including:

- **Local government:** Greater Maple Valley Unincorporated Area Council, Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC), Sammamish Plateau Water, Green/Duwamish and Central Puget Sound Watershed (WIRA 9)
- **Tribes:** Muckleshoot Tribe, Suquamish Tribe
- **Community-Based Organizations (CBOs):** InterIm CDA, Young Women Empowered, and several individuals who commented during an online CBO meeting hosted by ECOSSE
- **Joint letter from several civil society organizations:** Puget Soundkeeper Alliance, Duwamish River Cleanup Coalition, Zero Waste Washington, Washington Environmental Council, Waste Action Project, Sierra Club Seattle Group, and Environment Washington
- **Community members:** Other individuals who emailed comments or submitted a form letter

Commenters provided recommendations to WTD for Clean Water Plan investment priorities and input on issues and impacts to evaluate in the Clean Water Plan. Common, high-level themes are listed below. A comprehensive summary and the SEPA scoping comments are available online via [this link](#).

Water Quality, Environmental Health, and Fish & Wildlife: Protecting water quality, public health, and fish and wildlife were frequently mentioned. Aspects addressed included:

- **CSOs** – Some commenters focused on minimizing CSOs and adhering to current regulatory commitments, including the CSO consent decree. Several commenters also noted the relationship of CSOs to water quality in the Duwamish River basin and Duwamish Superfund sites. One comment described information that the County would need to demonstrate if it were to delay any CSO projects and propose “tradeoff projects” that could provide greater, measurable benefits to CSO receiving waters (without either “swapping” required projects for voluntary projects or “double counting” projects required under the stormwater permit).
- **Stormwater** – Commenters mentioned use of green stormwater infrastructure (including gentrification implications), relationship to groundwater quality, and treating stormwater rather than discharging it, among other issues. One comment addressed stormwater funding sources, including recommending expanding the scope of funding sources beyond those that pay sewer rates (e.g., those on septic, municipalities with stormwater systems) and adopting a true cost of service model (e.g., including accounting for infiltration and inflow [I/I]).
- **Pollution reduction** – Commenters addressed PFAS/PFOS¹ and other emerging contaminants, nutrient treatment, and reducing pollutants at the source.
- **Fish and wildlife** – Commenters discussed a range of issues related to fish and wildlife, including reducing impacts to salmon, steelhead, and shellfish (water pollution from new and legacy sources, temperature, improving fish passage, habitat, etc.), and the relationship of improvements to local habitat restoration and orca recovery efforts.

Equity & Social Justice: Several commenters noted the importance of considering impacts to communities of color and low-income communities. Issues included impacts in the Duwamish basin (where there are documented disproportionate public health and environmental justice impacts), rate affordability and structuring rates to avoid overburdening poor communities, relationship of investments to gentrification and affordable housing, and prioritizing marginalized communities for hiring and training for green jobs.

¹ Per- and polyfluoroalkyl substances (PFAS) are manmade chemicals that persist in the environment.

Tribal Rights: Several commenters noted the importance of tribal treaty rights to commercial, subsistence, and ceremonial fish and shellfish harvest, as well as the importance of considering impacts of Clean Water Plan alternatives on tribes.

WTD Infrastructure, Capacity, and Treatment: Comments on system optimization, treatment, and capacity issues included those that focused on impacts on component agencies (e.g., rates, I/I, collaboration with local agencies) to those that emphasized benefits to water quality and fish through advanced treatment for toxic pollutants and nutrients, increasing system capacity, aggressive I/I reduction, and other means. Commenters also provided specific infrastructure suggestions, such as smaller treatment facilities, improvements to West Point Treatment Plant, nutrient credit trading, consideration of seismic risks and sea level rise, etc.

SEPA Process: Many commenters (e.g., the form letter) called for a halt to scoping, arguing that the County had not provided the public with sufficient information to meaningfully comment and noting that more information was needed on King County's legal and regulatory obligations and the relationship of the Clean Water Plan to other planning processes.

Preliminary Findings from Action Analysis

Overview

As discussed at Advisory Group Meeting #6, the County continues to move through a systematic process to identify and evaluate how to make the best water quality investments for the region in the coming decades. The County is evaluating approximately 35 separate potential actions. The actions reflect different levels of service and ranges of performance, assumptions about the operational environment, and/or technological approaches. Each of these actions is associated with one of seven decision areas related to wastewater treatment services and regional water quality improvements, as follows. (See Attachment B for a full list of the decision areas and associated actions.)

- Wastewater treatment
- Wet weather management
- Pollution source control/product stewardship
- Asset management, resiliency, and redundancy
- Resource recovery
- Wastewater conveyance
- Legacy pollution

At this point in the process, the County is well into the development and analysis of the actions, conducting analysis in accordance with the methodological framework and related criteria discussed at Advisory Group Meeting #6. The evaluation categories explore outcomes consisting of water quality, cost, management and operations, community, and sustainability, with equity considered within each category.

Initial outcomes from the analysis are emerging, and the County is gaining a better understanding of what work is needed on the ground to implement the actions. The analysis illustrates the scope and scale of the potential investments, as well as the range of potential costs and performance outcomes. In particular, the County is learning about the pollutant reductions and potential cost ranges associated with different actions. The analysis also shows how some actions result in positive and negative impacts to the management and operations of the regional wastewater system, the community, and sustainability. There is still additional work needed to refine the initial analysis and estimate the

potential impacts to larger water quality outcomes, such as the impacts to receiving waters and aquatic life in the receiving waters. Similarly, the cost estimates are very preliminary and will be further refined as the Clean Water Plan Team continues the analysis.

Below is an overview of findings from development and initial analysis across selected actions in decision areas related to asset management, wastewater conveyance, wastewater treatment (nutrient removal and advanced treatment), and wet weather management (stormwater). During Advisory Group Meeting #7 on September 9, we will review examples of the initial findings in more detail.

Asset management, resiliency, and redundancy

Asset management, resiliency, and redundancy decision area overview: Asset management refers to the maintenance and care of facilities and infrastructure. These maintenance and care activities are essential to avoid system failures. The County is evaluating five total actions in this decision area, and initial findings for three of these actions are summarized below.

Medium level asset management investment action initial findings

- A medium investment level is expected to result in *less frequent system failures* as aging infrastructure is replaced or rehabilitated sooner. The potential for reduction and the expected level of frequency of failures continue to be evaluated.
- The resiliency of the system to earthquakes is prioritized in this action and would be addressed by 2035. By that time, the system would be rehabilitated to current seismic codes and therefore be more resilient to seismic events.
- As with the low-level investment action, temporary and geographically dispersed water quality impacts would occur, but forecasting the timing and extent of these impacts is challenging.

Low-level asset management investment action initial findings

- A low-level of investment is expected to result in *infrequent, but ongoing facility failures* as infrastructure continues to age.
- The resiliency of the system to earthquakes would slowly be addressed through facility replacement, seismic retrofits, or some other mitigation measures through 2060. A portion of the facilities would remain at a higher level of risk to seismic events through 2060.
- Temporary and geographically dispersed water quality impacts would occur, but forecasting the timing and extent of these impacts is challenging.

Run-to-failure asset management investment action initial findings

- A run-to-failure investment level would result in *increased system failures* that would be addressed through emergency repairs.
- This approach would result in higher long-term costs, specifically life cycle costs. Community impacts associated failures and emergency repairs will occur.
- Temporary and geographically dispersed water quality impacts also would occur associated with the system failures, but forecasting the timing and extent of these impacts is challenging.

Overall asset management takeaways

- Comparing the different investment levels reveals different outcomes in community impacts associated with system failures. For example, the lower levels of investment result in more

failures causing impacts, including to cultural and recreational uses as well as community disruption associated with emergency repairs.

- The County is continuing to assess the ability to estimate how many failures leading to overflows would occur and in what geographic locations. Given the amount of sewage or combined stormwater and sewage associated with failures, overflows are expected to result in relatively low long-term water-quality impacts, while individual events have temporary localized impacts.

Wastewater conveyance actions

Wastewater conveyance decision area overview: The conveyance system's role is to transfer wastewater produced at homes and businesses in WTD's separated sewer area to treatment plants for proper treatment. Without the conveyance system, wastewater would be on the ground and in local surface waters, threatening public health and the environment. The County is evaluating five total actions in this decision area and initial findings for two of these actions are summarized below.

Status quo conveyance (20-year level of service) action initial findings

- King County currently has one of the highest design standards for sewer capacity in the nation. The regional wastewater system improvements that King County carries out result in a system sized to accommodate *95% of the peak flow* expected to occur in any given year or peak flows that have a 5% chance of occurring in any given year.
- Currently, limited overflows occur from the regional wastewater conveyance system as a result of sewer capacity. These overflows have temporary and geographically dispersed water quality impacts as the overflows occur at specific points in the service area.
- Providing this high standard and maintaining a low risk of overflow requires a higher level of spending.

Five-year conveyance level of service (reduced investment) action initial findings

- This action explores a lower sewer capacity standard that would result in a system sized to accommodate *80% of the peak flow* expected to occur in any given year or peak flows that have a 20% chance of occurring in any given year.
- While there is an expectation of a small increase in sewer capacity overflows, initial findings indicate there would be little difference in water quality impacts. As is the case for the status quo conveyance system standard, the water quality impacts would be temporary and geographically dispersed throughout the service area.
- The cost of the lower system capacity standard for this action would be about half the cost of meeting the current standard.

Overview wastewater conveyance takeaways

- The County is continuing to verify and refine the initial findings and the extent to which receiving water impacts can be characterized.
- If initial findings related to water quality impacts are validated, an opportunity for better optimizing future capacity investments would exist.

Wastewater treatment – nutrient removal and advanced treatment

Wastewater treatment decision area overview: The County is exploring different levels of treatment for the wastewater system, including continuing the current secondary treatment level, secondary treatment plus nitrogen removal, advanced treatment to remove additional pollutants, and decentralized treatment through satellite or building-scale treatment. Initial findings from three of the ten treatment actions (two of the three actions related to nitrogen, and the one on advanced treatment) are summarized below.

- **Nutrient removal:** Some areas of Puget Sound are experiencing low dissolved oxygen levels. Nitrogen contributes to low dissolved oxygen in marine waters. Since wastewater treatment plants are the largest dischargers of nitrogen from human activity, the Washington State Department of Ecology is exploring regulating wastewater dischargers for nitrogen. Specific regulatory mechanisms and effluent limits have not been determined, so the Clean Water Plan is exploring several potential nitrogen removal mechanisms.
- **Advanced treatment:** Exploring advanced treatment provides insights into reducing discharge of treated wastewater to Puget Sound.

Nutrients – individual discharge permits (individually permitted nitrogen removal) action initial findings

- This action explores reducing effluent nitrogen from ~30 mg/L at each of the County's three regional treatment plants by assuming each plant will meet an individual permit limit of 8 mg/L year-round.
- The West Point Treatment Plant does not have enough land to upgrade to nitrogen treatment for the entire flow required for this action and would only be able to treat about half of its current flow. In addition, due to site constraints, construction at West Point would be very complex and difficult and likely require by-pass and discharge of partially treated wastewater for several years.
- A new, 4th regional treatment plant would be needed in the Seattle area to treat the flow that is not able to be treated at West Point. The new treatment plant would be approximately three times the size of the Brightwater Treatment Plant and the largest membrane bioreactor (MBR) treatment plant in North America.
- The technology to remove nitrogen is complex to operate and, for this action, would require twice as much energy as well as increase greenhouse gas emissions by approximately 50% over current treatment operations.
- Initial analysis indicates the cost to achieve nitrogen removal and provide capacity for regional growth over the planning period is high.

Nutrients – single bubble permit across discharges (County systemwide permitted nitrogen removal) action initial findings

- This action explores reducing effluent nitrogen by assuming that the County will meet an effluent nitrogen limit for the entire system. Under this action:
 - South Plant and Brightwater Treatment Plants would treat to lower effluent nitrogen levels.
 - West Point would have modest upgrades and higher effluent nitrogen levels than the other two plants. A new, 4th regional treatment plant would not be needed.

- The technology to remove nitrogen is complex to operate and, for this action, would require 2.5 times as much energy as well as increase greenhouse gas emissions by approximately 60% over current treatment operations.
- Initial analysis indicates capital cost (not including operations) to achieve nitrogen removal and provide capacity for regional growth over the planning period through a systemwide permitted approach is approximately half the cost of the individually permitted nitrogen removal action.

Advanced treatment to reduce effluent discharge action initial findings

- This action explores reducing effluent discharge to Puget Sound by upgrading South Plant to advanced treatment, and Brightwater and West Point for nitrogen removal. West Point nitrogen removal upgrades would be modest, similar to those in the “bubble permit” action above.
- Except during major storms, discharge to Puget Sound from South Plant would be eliminated. South Plant currently accounts for about one third of total King County discharge to Puget Sound.
- Upgrading South Plant to advanced treatment would require siting and construction of a new facility with the advanced treatment process adjacent to or near South Plant.
- The advanced treatment process would produce water to potable recycled water levels. It is highly unlikely that it would be feasible to recharge groundwater with this treated water due to the soils and geology in the area. Potable recycled water could be conveyed to a regional water reservoir for blending with other potable water sources.
- Advanced treatment technologies are complex to operate, would require three times as much energy, and would increase greenhouse gas emissions significantly over the current treatment operations.
- Initial analysis indicates capital cost (not including operations) for advanced treatment at South Plant, nitrogen removal at West Point and Brightwater, and to provide capacity for regional growth over the planning period is approximately 50% more than nitrogen removal through a “bubble permit” action and 25% less than the cost of the individually permitted nitrogen removal action.

Overview wastewater treatment takeaways

- These treatment actions only reduce pollutants to Puget Sound; other waterbodies would not be affected.
- There is a substantial range of cost between the different treatment actions. The County is continuing to examine what differences in nitrogen removal for the treatment actions means in terms of impacts to Puget Sound water quality and to ecological and public health endpoints.
- Reducing effluent discharge to Puget Sound by upgrading South Plant to advanced treatment would have a similar reduction of nitrogen and solids (TSS) loads to Puget Sound as the “bubble permit” nitrogen action.
- Regardless of the technology or mechanisms used, the capital costs to reduce effluent nitrogen or to upgrade to advanced treatment are high, and would result in added operational complexity, increased energy use, and increased greenhouse gas emissions.

Wet weather management – stormwater

Wet weather management decision area and stormwater actions overview: The County is exploring a range of options for managing stormwater and CSOs in the Clean Water Plan, including continuing current planned CSO control projects as well as other options that could result in equivalent or higher water quality benefits. Of the five actions in this decision area, the County has initial findings available for two of the three actions that focus on stormwater, as summarized below. These

stormwater actions are designed to explore outcomes of stormwater management improvement opportunities to capture and treat more stormwater, either through use of the existing wastewater treatment system or constructing new infrastructure.

Expanded stormwater treatment at existing facilities action initial findings

- This action leverages the use of the existing wastewater treatment system (pipes and treatment) during smaller storm events, when capacity exists in the wastewater system.
- There are physical, infrastructure restrictions on the extent and locations where this action could be implemented.
- This action would result in some decrease in wastewater system resiliency.
- Operating costs, energy use, and greenhouse gas emissions would increase compared to current treatment system operations.

Stormwater treatment at new facilities action initial findings

- Stormwater treatment in this action would be a blend of traditional (“gray”) and green infrastructure, targeted to areas where no or little existing stormwater controls currently exist.
- The action is scalable, would not significantly increase energy use or greenhouse gas emissions from existing conditions, and has the potential to provide a community amenity from additional green space.
- The new stormwater infrastructure has the risk of unintended consequences, such as consuming public parking or contributing to gentrification.

Overall stormwater takeaways

- Pollutant reduction is likely to be similar for both stormwater actions. Further analysis on pollutant reduction is occurring, including reflecting which waterbodies would be affected.
- Costs may be 2 to 5 times more for the new infrastructure action compared to the use of existing wastewater infrastructure. The County is continuing to refine cost estimates for both stormwater actions.

Programmatic Strategy Formulation

Overview

The Clean Water Plan process is laying the foundation for a thoughtful and transparent evaluation to make critical decisions that will shape the scope and focus of water quality investments in the coming decades. The County is undertaking the planning process in the context of facing unprecedented regional water quality needs that will require billions of dollars in investments. The planning process also needs to address the complexity arising from multiple factors influencing the region’s water quality future, including climate change, socio-economic inequities, current and future regulations, aging infrastructure, and population growth. In response, the planning process is exploring alternative investment approaches the County can make in support of wastewater treatment services and regional water quality improvements, seeking to inform decisions on the best investments for regional water quality. To inform the investment decisions, the Clean Water Plan Team will formulate and evaluate alternative programmatic strategies.

As indicated in the previous section, actions are the potential specific investments and associated programs and projects within each decision area that are being considered for the Clean Water Plan. Attachment B provides an overview of the decision areas and associated actions (reviewed and

discussed at Advisory Group Meeting #5). These actions will become the building blocks for the alternative programmatic strategies. The Clean Water Plan Team is deep into developing an understanding of each action's potential water quality outcomes and other impacts. This understanding now allows the Clean Water Plan Team to initiate thinking about the design of WTD systemwide programmatic strategies.

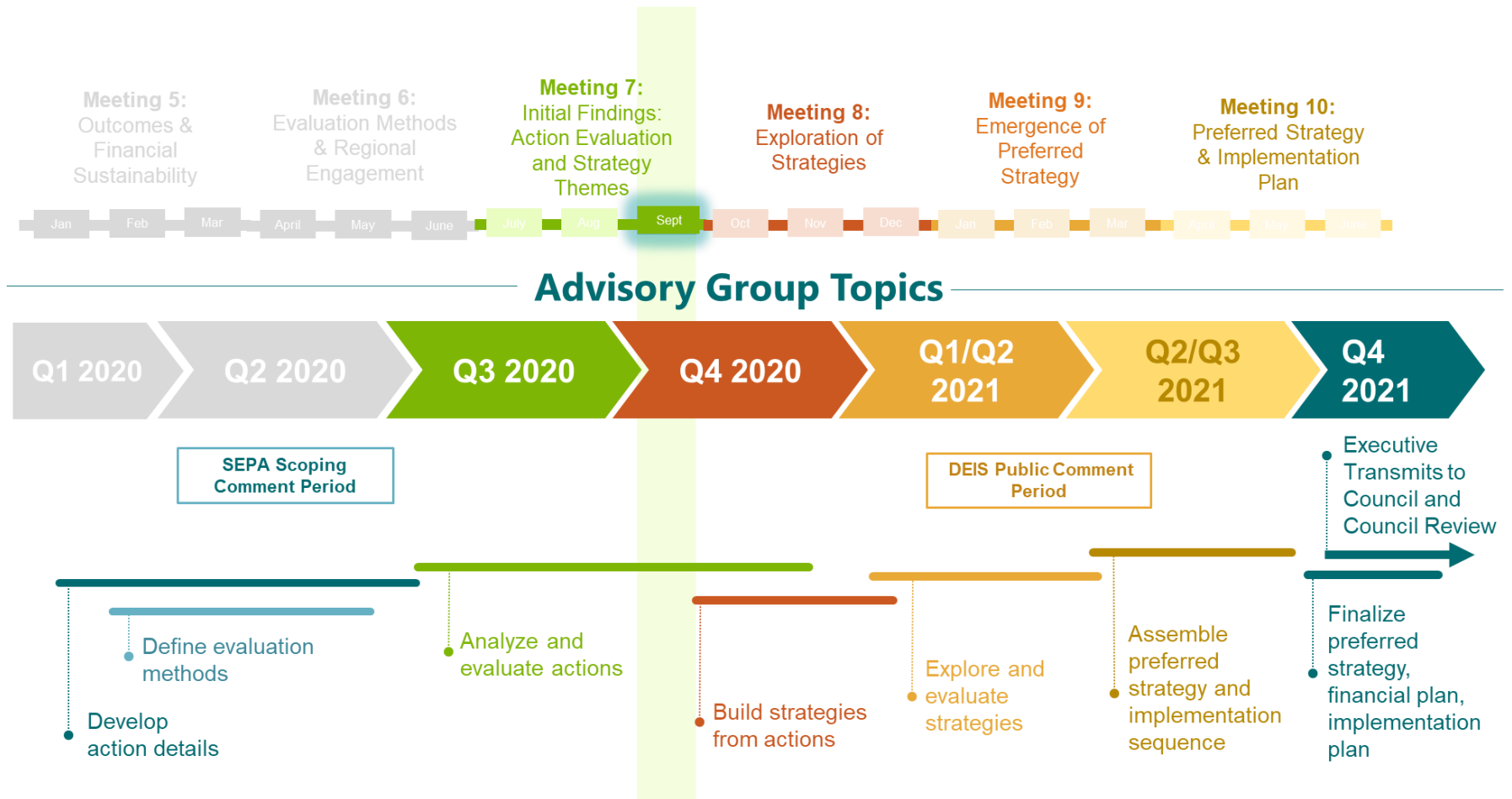
The Clean Water Plan Team currently anticipates assembling, comparing, and exploring between three and five programmatic strategies. Each strategy will reflect a grouping of multiple actions that incorporates timing, sequencing, and inter-relationships among actions, and each strategy will reflect a complete water quality investment approach for the County. Essentially, the strategies will provide different cohesive pathways for water quality and WTD system improvements. During strategy exploration, the Clean Water Plan Team will explore the water quality outcomes, benefits, and impacts of comprehensive water quality investment approaches to facilitate a comparison across the programmatic strategies; to provide a basis for understanding the choices, challenges, and opportunities the region faces; and to inform the shaping and selection of a preferred strategy. Ultimately, the preferred strategy will seek to support the core Clean Water Plan objective of determining what is the most appropriate path to ensure the County can direct the right public investments to the right actions at the right time for the best water quality outcomes.

Strategy Exploration

The Clean Water Plan Team expects the strategy exploration process to have similarities to the action evaluation process, but not be identical, since strategy exploration will allow for a more comprehensive, systemwide understanding of outcomes, such as distributional equity, programmatic financial resource requirements, and the overall timing, magnitude, and location of water quality improvements. Assembling the strategies will take into consideration: the results of the action analysis; community input related to regional priorities and values; the SEPA scoping comments; critical WTD system requirements; current and anticipated regulations and obligations; and other related regional planning and program efforts. Features for each strategy currently under consideration by the Clean Water Plan Team include the following:

- Represent a “complete package” of investments (programs, projects, and policies) designed to address the full range of the decision areas - the strategies will provide different cohesive pathways for water quality and WTD system improvements.
- Distinctive from each other to provide for an effective exploration of alternatives as well as clearly tee up the choices, challenges, and opportunities the region has for advancing water quality and WTD system performance.
- Take into account existing and anticipated future obligations (e.g., regulations).
- Reveal the water quality performance anticipated (including type, magnitude, location, and timing) as well as broader ecosystem and sustainability benefits to the extent supported by available data and methods.
- Indicate the contribution to addressing Equity and Social Justice determinants.
- Programmatic financial resource needs, over what time period, to support the strategy.
- Policy considerations for implementing the strategy (e.g., enhanced regional collaboration, alterations to current policy, etc.).

Attachment A: Clean Water Plan Activities & Advisory Group Meeting Topics



Attachment B: Clean Water Plan Actions for Exploration

Decision Area: Wastewater Treatment

Actions for Exploration:

- Status Quo Treatment
- Nutrients – Individual Discharge Permits
- Nutrients – Single Bubble Permit Across Discharges
- Nutrient Trading – Multiple Source Discharge Management
- Advanced Treatment to Reduce Effluent Discharge
- Decentralized Satellite Treatment Plants
- Building Scale Decentralized Treatment
- Decentralized Combined CSO/Wastewater Treatment
- Status Quo Onsite Septic System Program
- Expanded Onsite Septic System Program

Decision Area: Wet Weather Management

Actions for Exploration:

- Status Quo CSO Program
- Modified Approaches to CSO Control
- Expanded Stormwater Treatment at Existing Facilities
- Stormwater Treatment at New Facilities
- Stormwater Retrofit Fund – Regional Collaboration

Decision Area: Pollution Source Control/ Product Stewardship

Actions for Exploration:

- Status Quo Source Control Program
- Expanded Pollution Elimination and Control Focus
- State/Federal Requirements Source Control Approach

Decision Area: Asset Management, Resiliency, and Redundancy

Actions for Exploration:

- High Level Asset Management Investment
- Medium Level Asset Management Investment
- Low Level Asset Management Investment
- Run to Failure Asset Management
- Adaptive Sea Level Rise

Decision Area: Resource Recovery

Actions for Exploration:

- Status Quo Biosolids and Energy Program
- Enhanced Biosolids and Energy Program

Decision Area: Wastewater Conveyance

Actions for Exploration:

- Status Quo Conveyance
- 5-year Conveyance Level of Service
- Inflow and Infiltration – Point of Sale Inspections
- Inflow and Infiltration – Peak Flow Standards
- Smart Utility – Data Driven, Real Time Control

Decision Area: Legacy Pollution

Actions for Exploration:

- Status Quo Sediment Management
- Far Reaching Legacy Pollution Program
- Accelerated Sediment Management