DATE: November 29, 2021

TO: Clean Water Services Advisory Commission Members
and Interested Parties

FROM: Mark Jockers, Chief of Staff

SUBJECT: **REMINDER AND INFORMATION FOR DECEMBER 8, 2021, CWAC MEETING**

This is a reminder that a Clean Water Services Advisory Commission (CWAC) meeting is scheduled for **Wednesday, December 8, 2021.**

In support of best practices for preventing the spread of the coronavirus, CWS has adopted the following format for the December meeting:

- The meeting will be held virtually using the Webex platform.
  - Webex offers the option to connect to video, slides and audio via a device with internet access, or an audio-only connection through any telephone line.
  - CWAC members should watch for an email containing Webex connection details.
  - Interested parties should register for this meeting by December 7 by following the instructions on the website.
- The meeting will begin at 5:30 p.m. Please plan to establish your connection to the meeting 10-15 minutes before the start time to allow the meeting to begin promptly.
- Dinner will not be provided.

The CWAC meeting packet will be mailed to Commission members on Monday, November 29, and posted to the CWAC section of the Clean Water Services' website.

Please call or send an email to Stephanie Morrison (morrisons@cleanwaterservices.org; 503.681.5143) by December 7 to advise about your attendance at this meeting.

Enclosures in this packet include:

- December 8 Meeting Agenda
- East Basin Master Plan Executive Summary
- November 10 Meeting Notes

Clean Water Services Advisory Commission

December 8, 2021

AGENDA

5:30 p.m. **Welcome and Introductions**

5:40 p.m. **Review and Approve Summary of November 10, 2021, Meeting**

5:50 p.m. **East Basin Master Plan**

On November 30 the CWS Board of Directors will be asked to charge CWAC with reviewing the East Basin Master Plan and making a recommendation to the Board on adoption.

The Durham Water Resource Recovery Facility and the sewer pipes and pumps that drain to that facility are collectively known as the East Basin. The East Basin Master Plan is a comprehensive examination of the 20-year infrastructure needs of the system that serves more than 200,000 residents of Sherwood, Tigard, Tualatin, King City, Durham, Metzger and portions of Beaverton, Aloha, Portland and Lake Oswego.

The purpose of the East Basin Master Plan is to manage the collection and treatment system assets and plan for necessary improvements to:

- Accommodate growth, including expansion and infill.
- Anticipate and meet regulatory requirements.
- Upgrade, replace or restore aging infrastructure.

The East Basin Master Plan will help Clean Water Services plan for and sequence investments. The project list in the Master Plan is the foundation for the CWS Capital Improvement Plan and System Development Charges, and influences rates and financing.

- Nate Cullen, Chief Operating Officer
- Rick Shanley, Treatment Plant Services Manager

Requested Action: *Informational and discussion*

6:45 p.m. **Invitation for public comment**

6:50 p.m. **Announcements**

7:00 p.m. **Adjourn**

Next Meeting: January 12, 2022

East Basin Master Plan

NOVEMBER 2021

carollo
Engineers...Working Wonders With Water®

Jacobs

Clean Water Services

Introduction

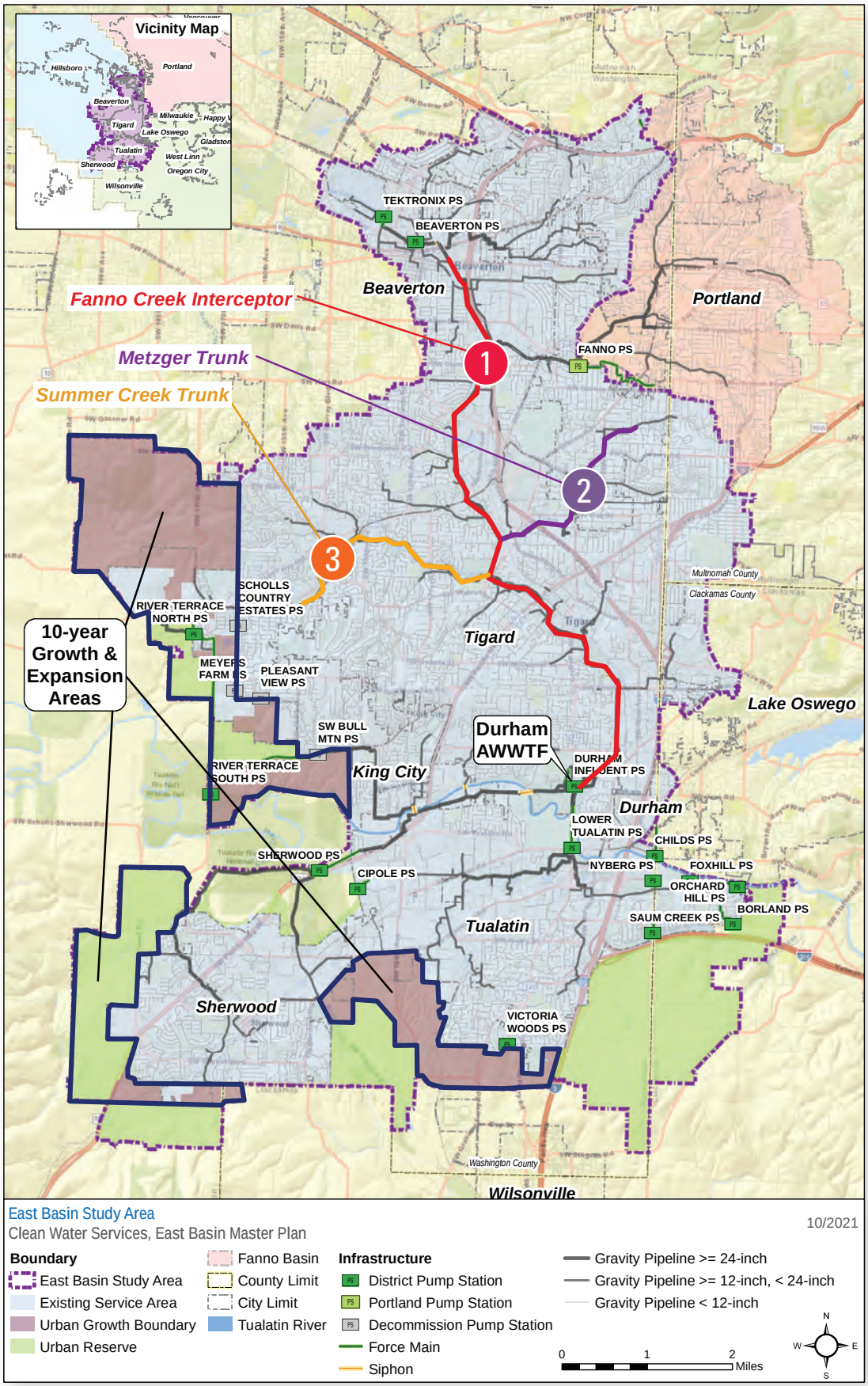
The mission of Clean Water Services (the District) is to safeguard the Tualatin River's health and vitality, ensure the economic success of our region, and protect public health for over 600,000 residents and businesses in urban Washington County. The District's past planning efforts have protected the Tualatin River, but anticipated growth and emerging challenges have necessitated a revised planning process to accomplish the District's mission.

Instead of preparing separate East Basin Collection System and Durham Advanced Wastewater Treatment Facility (AWWTF) Plans, this current planning process combined these efforts into an integrated plan for the East Basin. This integrated planning effort allows for a consistent approach and set of planning data for both the East Basin collection system and the Durham AWWTF to meet the following future challenges:

- **Population Growth**
  - » Infill of existing served areas (State Housing Bill 2001 allows single family residential zoning areas to densify).
  - » Expansion of the collection system into the identified growth areas, including Beaverton, Tigard, King City, Sherwood, and Tualatin.
- **Uncertain Regulatory Environment**
  - » Durham AWWTF permit conditions.
- **Infrastructure Age/Condition**
  - » Fanno Creek Interceptor.
  - » System-wide.
  - » Durham AWWTF.
- **Wet Weather Capacity** (see Study Area Map on adjacent page)
  - 1 **Fanno Creek Interceptor.**
  - 2 **Metzger Trunk.**
  - 3 **Summer Creek Trunk.**

The District established the following goals for the integrated plan (Plan):

1. Advance strategies to improve overall watershed health.
2. Be flexible and provide a framework for successful long-term implementation decisions.
3. Be a vision for the future.
4. Be cost effective.
5. Be resilient with respect to climate change and seismic risks.

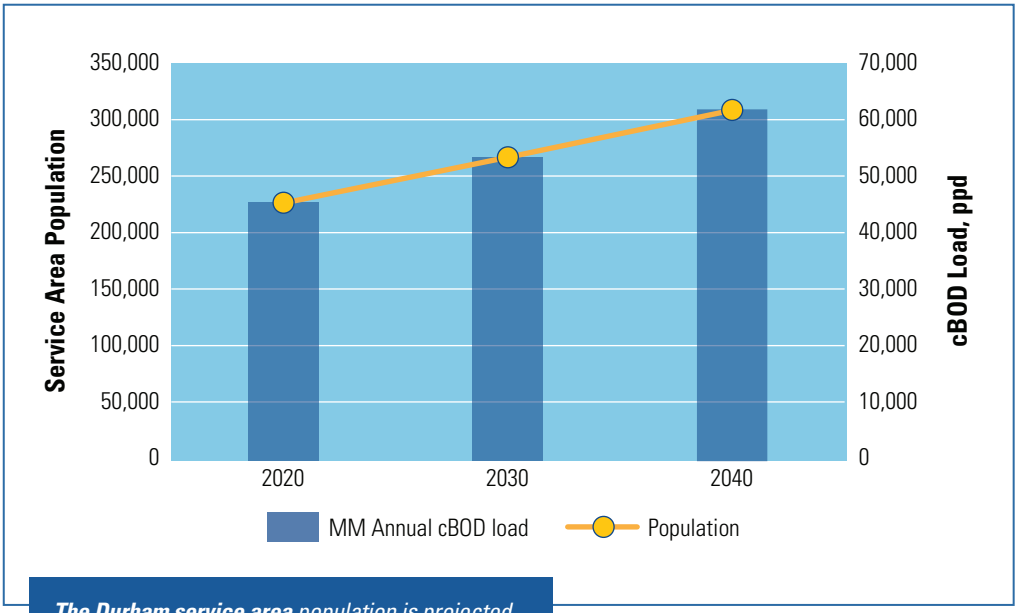

Vicinity Map
Hillsboro
Portland
Beaverton
Tigard
Milwaukie
Happy V
Lake Oswego
Gladstone
Tualatin
West Linn
Sherwood
Oregon City
Wilsonville
TEKTRONIX PS
BEAVERTON PS
Beaverton
Portland
Fanno Creek Interceptor
Metzger Trunk
Summer Creek Trunk
1
FANNO PS
2
3
SCHOLLS COUNTRY ESTATES PS
RIVER TERRACE NORTH PS
MEYERS FARM PS
PLEASANT VIEW PS
10-year Growth & Expansion Areas
Tigard
Multnomah County
Clackamas County
Lake Oswego
SW BULL MTN PS
Durham AWWTF
DURHAM INFLUENT PS
RIVER TERRACE SOUTH PS
King City
Durham
LOWER TUALATIN PS
CHILDS PS
SHERWOOD PS
CIPOLE PS
NYBERG PS
FOXHILL PS
ORCHARD HILL PS
BORLAND PS
SAUM CREEK PS
Tualatin
Sherwood
VICTORIA WOODS PS
Washington County
Wilsonville
East Basin Study Area
Clean Water Services, East Basin Master Plan
10/2021
Boundary
East Basin Study Area
Existing Service Area
Urban Growth Boundary
Urban Reserve
Fanno Basin
County Limit
City Limit
Tualatin River
Infrastructure
District Pump Station
Portland Pump Station
Decommission Pump Station
Force Main
Siphon
Gravity Pipeline >= 24-inch
Gravity Pipeline >= 12-inch, < 24-inch
Gravity Pipeline < 12-inch
0
1
2
Miles
N
W
E
S

Updated Basis of Planning

A sound basis of planning is essential to making informed decisions that meet the Districts near and long-term treatment and collection system needs. The key elements updated in this Plan include: flows and loads, regulatory requirements and resiliency considerations.

Flows and Loads

The Durham service area population is projected to increase by 36 percent during the 20-year planning period at an annual growth rate of 1.8 percent according to the Portland State University Population Research Center. This population increase would result in projected flow and carbonaceous biochemical oxygen demand (cBOD) and total suspended solids (TSS) load increases of approximately the same magnitude. The projected wet weather flows were developed using the calibrated collection system model. Maximum hour wet weather flows are projected to increase by 30 percent during the next 20 years to 157 mgd.



***The Durham service area** population is projected to increase by 36 percent in the next 20 years.*

Regulatory Requirements

The planning team worked closely with the District's Regulatory Advisory Group to determine the likely future permit requirements. Two permit conditions that could change were identified, as summarized below.

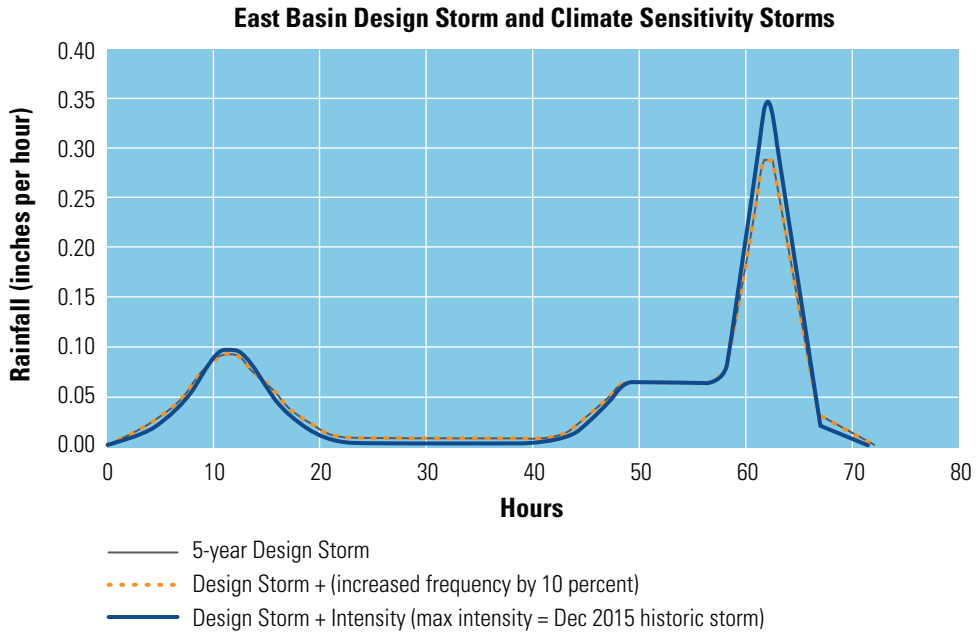
- **Phosphorous.** Water quality modeling suggests that the Tualatin River is no longer as sensitive to phosphorus inputs as it once was. The District is working with Oregon Department of Environmental Quality (DEQ) to support an update of the phosphorus TMDL. Based on this uncertainty, two effluent total phosphorus (TP) scenarios were evaluated: (1) current summer limits of 0.11 mg/L TP and (2) relaxed summer limits of 0.5 mg/L TP.
- **Aluminum.** A water quality criteria for aluminum was promulgated by EPA in December 2020. Effluent data suggests that the District would be able to comply with the water quality criteria for aluminum with the use of the bioavailable test method (an option allowed for in the final rule). The District is working with DEQ on method establishment. For the purposes of facilities planning, the Plan presumes that the discharge from the Durham facility would be able to meet water quality criteria for aluminum with the continued use of alum for phosphorus removal.

Additionally, per- and polyfluoroalkyl substances (PFAS) are contaminants of increasing concern. The future of regulatory action on PFAS is uncertain, however it is likely that there may be future restrictions that could affect the land application of biosolids. Therefore, solids stabilization processes that destroy PFAS or the ability to be able to cost effectively add processes that could destroy PFAS were considered during the solids planning process.

Resiliency Considerations

A key consideration of the planning effort is to assess seismic and climate change resiliency for both the collections system and AWWTF.

- **Climate Resiliency.** Information from the Oregon Climate Change Research Institute and the Climate Impacts Research Consortium was used to project the impacts of climate change through the planning period. This research found that by the end of the planning period (year 2040), climate change may increase the frequency of extreme events by about 10 percent. Because there is low to moderate confidence in these estimated climate changes, the planning team recommended performing a stress test by modeling a "climate sensitive" storm to identify system deficiencies and potential improvements.



***A stress test** of the collection system using a "Climate Sensitive" storm modeled to increase the climate resiliency of the East Basin.*

- **Seismic Resiliency.** A seismic hazard assessment was conducted of the East Basin collection system and the Durham AWWTF. This assessment found that the majority of the East Basin collection system is located within seismic hazard zones while the majority of the Durham AWWTF is located in relatively low seismic hazard areas. Due to the extent of the collection system located in the seismic hazard zones, it is not feasible to improve all existing pipelines. However, all new or improved pipelines should be designed to address seismic hazards. Additionally, seismic considerations were included in the alternatives analysis for the collection system

Planning Outcomes

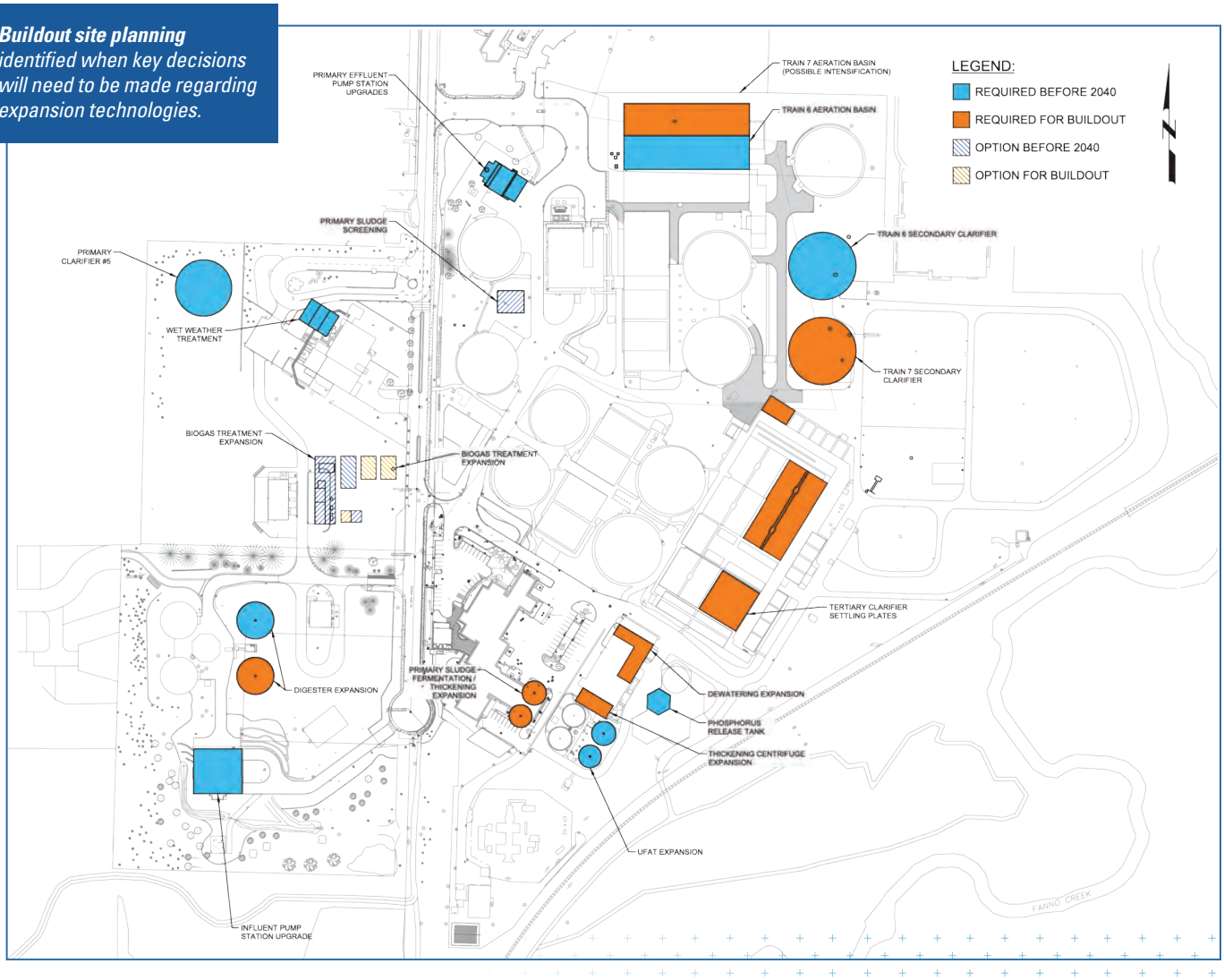
This section highlights the following outcomes and features of this Plan that will guide the District in making key decisions and optimizing facilities:

- ✓ Planning for AWWTF site buildout for a clear vision of the future site needs.
- ✓ Optimizing operations and energy recovery at the AWWTF.
- ✓ Decision-making process.
- ✓ Creating a "Living" Plan to facilitate the District making efficient on-going and real-time updates to the Plan.

Site Buildout Planning

To provide an understanding of maximum site capacity, a site plan was developed that could accommodate the basin buildout flows and loads. This site planning effort identifies when key site planning decisions will need to be made such as whether secondary train 7 (required sometime after the planning period) will need to be built with intensification technology to extend both the capacity of the secondary and tertiary processes.

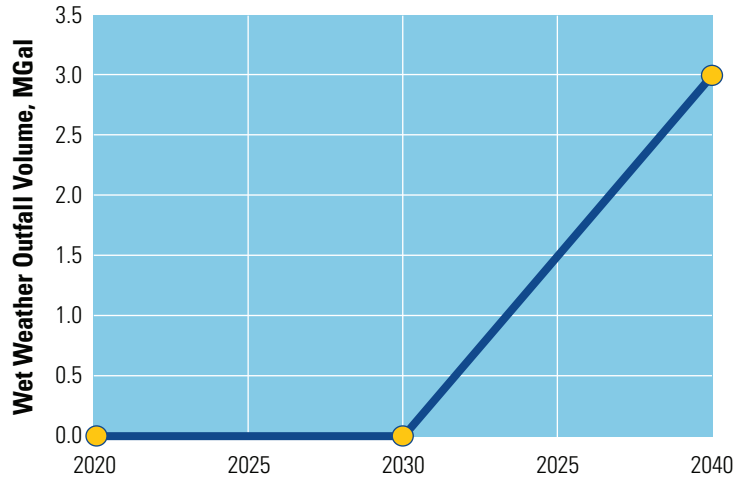
Buildout site planning *identified when key decisions will need to be made regarding expansion technologies.*



Operations Optimization at Durham AWWTF

Surge Basin Optimization

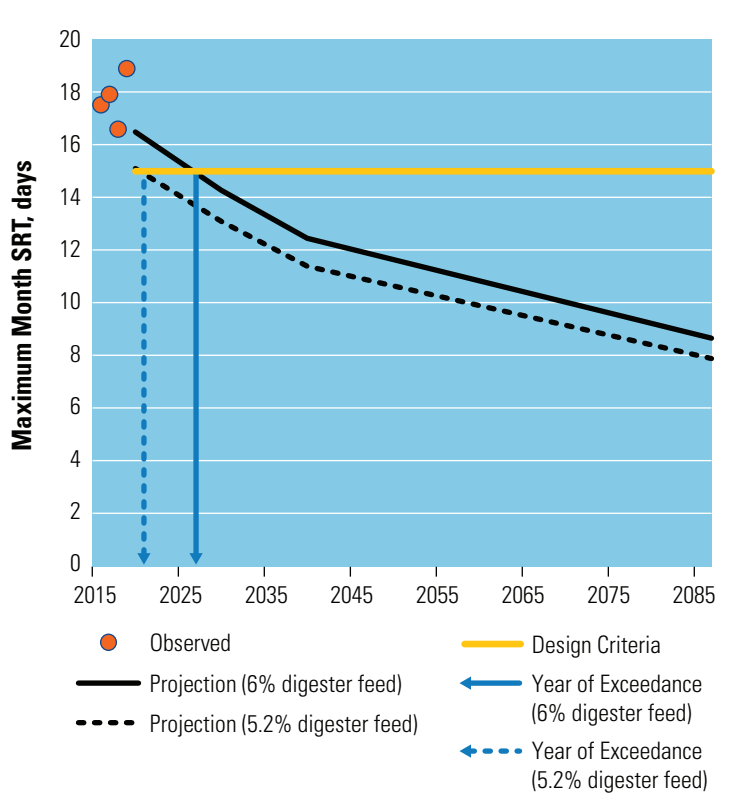
The District identified an opportunity to maximize plant capacity and improve effluent quality by reconfiguring their two surge basins, which equalize peak flows. By dedicating the large surge basin for primary effluent flow and the small surge basin for secondary effluent, the surge basin return flow is limited to just the large surge basin, which improves effluent quality. Additional modeling found that this operational mode resulted in minimal use of the wet weather outfall within the planning period.



Surge basin optimization *results in minimal use of the wet weather outfall during the projected 1 in 5 year storm.*

Digester Loading Optimization

Using historically conservative assumptions for the thickened concentration of the primary and waste activated sludge, suggested that an anerobic digester would be required within the next couple of years. Since the District is not currently out of anaerobic digester capacity based on historic solids residence times (SRT), the planning team worked with the District to identify operational targets for thickened sludge concentration that would defer the need for additional digestion capacity. Based on historic volatile solids reduction rates, this thicker feed concentration will yield a digester total solids concentration of around 3.5 percent, which is within the allowable range for these digesters. The District worked with operations staff to determine that the existing pumps could handle these higher feed concentrations. This optimization effort allowed the anaerobic digestion project to be deferred by 6 years, pushing the timing to the year 2027.

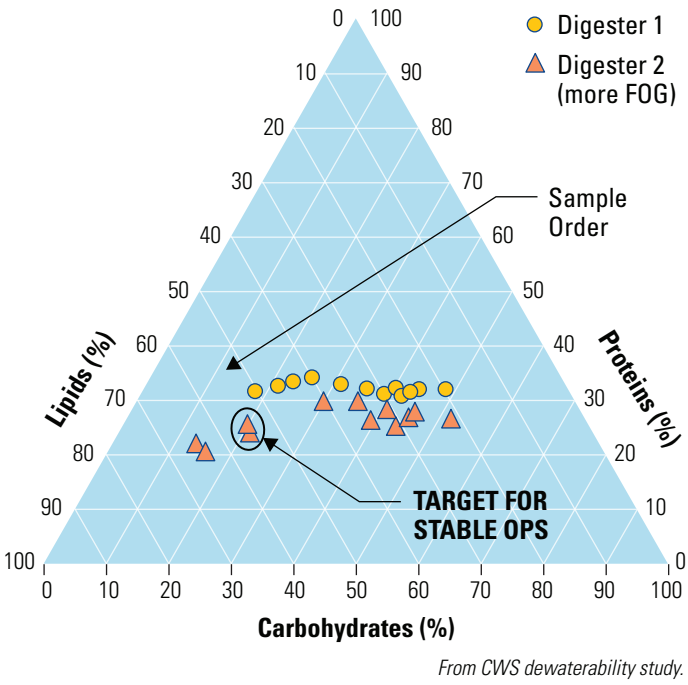


Planning for a thicker *digester feed allows the anaerobic digestion project to be pushed out 6 years to the year 2027.*

Energy Recovery Optimization at Durham AWWTF

FOG Loading Optimization

In 2015, the Brown Grease Receiving Facility came online, allowing Durham to accept fats oils and grease (FOG) and other high strength waste such as brown grease from waste haulers. This waste is processed in the anaerobic digesters and increases energy recovery through cogeneration. As part of the Plan, a scientific approach was taken to determining the optimum mixture of indigenous sludge and high strength waste based on the target protein, lipid and carbohydrate ratios in stable anaerobic digestion operation. This evaluation determined that for stable digestion, the high strength waste should be no greater than 30 percent of the total digester feed volatile solids loading. This finding is supported by the District staff operational experience and provides guidance to the District as to the target quantity of FOG.

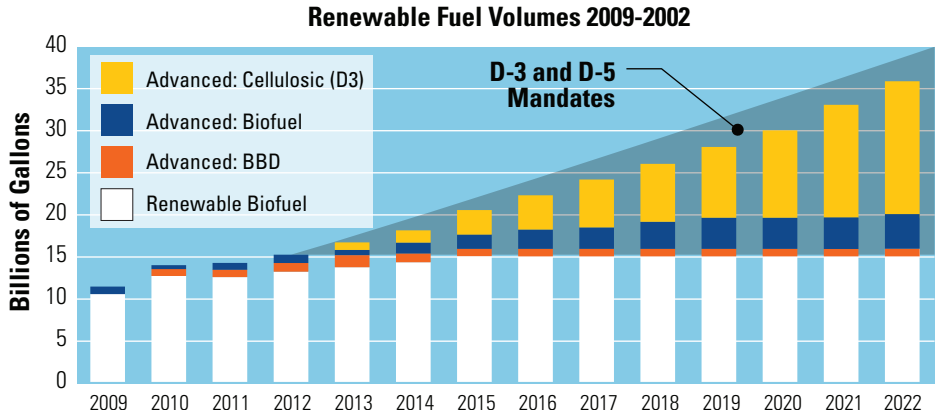


From CWS dewaterability study.

***The Plan established** optimum high strength waste loading rates to optimize energy recovery.*

Setting up for Renewable Natural Gas

While the District currently plans to continue using their cogeneration process through the year 2030, the Plan evaluated alternate end uses for the digester gas. One promising avenue for digester gas is to create renewable natural gas for pipeline injection. Due to the increasing EPA mandated volumes of renewable fuels that oil and gas manufacturers are required to purchase each year, pipeline injection of digester



***The EPA's mandated** renewable fuel volumes provide a strong incentive for utilizing Durham's digester gas (part of the D3 and D5 mandate) through pipeline injection.*

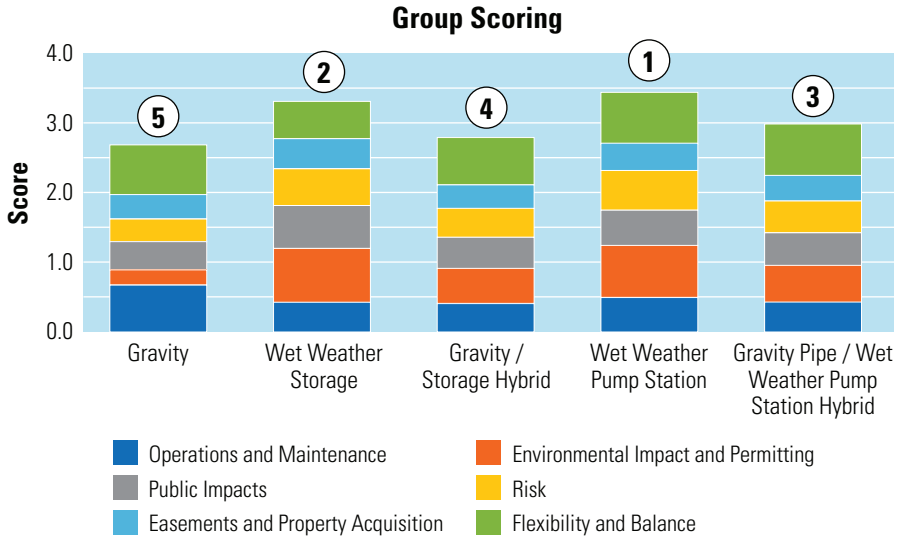
gas can provide not only environmental benefits, but a financial benefit to the District as well. The Plan documented the additional gas conditioning steps that would be required to produce pipeline quality gas and allocated site space for these future processes to facilitate potential future implementation.

Collection System Decision-Making Process

The planning team collaborated with the District to evaluate, score and select conveyance system improvements from multiple alternatives. The process was focused on integrating multiple perspectives in scoring and selecting system improvements. Conveyance, pumping and treatment, natural resources, and O&M staff were all involved in developing the scoring criteria, alternatives review and alternatives scoring. The following categories were used for scoring:

- Operations and maintenance requirements.
- Environmental impact, environmental enhancement opportunities, and permitting requirements.
- Public impact.
- Constructability risks.
- Easement and property acquisition requirements.
- Flexibility for timing of implementation and balancing of wet weather reduction with capacity upgrades.

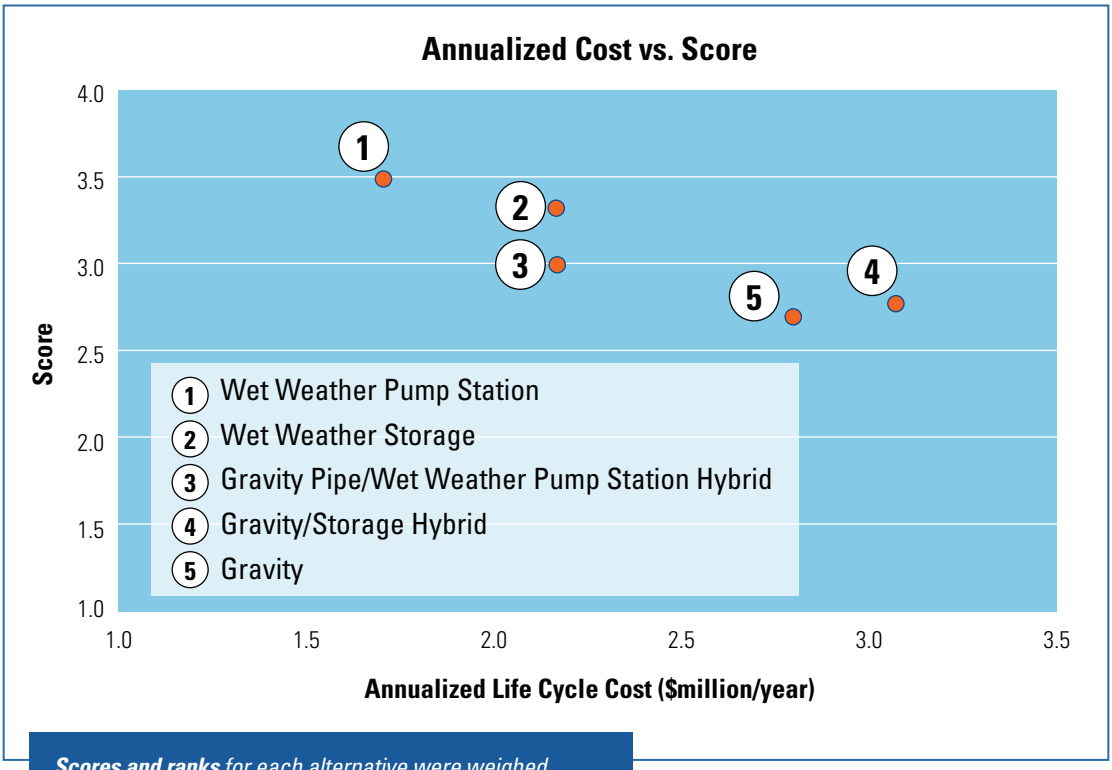
An example output from the scoring process is shown in this graphic. The alternatives were ranked based on score with a higher score representing a preferential alternative.



***The decision-making** process integrated a cross-section of staff perspectives and accounted for multiple criteria to score and rank improvement alternatives.*

District staff also considered life cycle costs for each alternative when selecting a preferred improvement for implementation. Life cycles cost estimates considered initial capital costs, replacement costs based on infrastructure design life, annual operations and maintenance costs, and annual energy costs.

The graphic below provides an example of the annualized life cycle cost vs. score for a set of conveyance improvement alternatives.



***Scores and ranks** for each alternative were weighed against the annualized life cycle costs.*

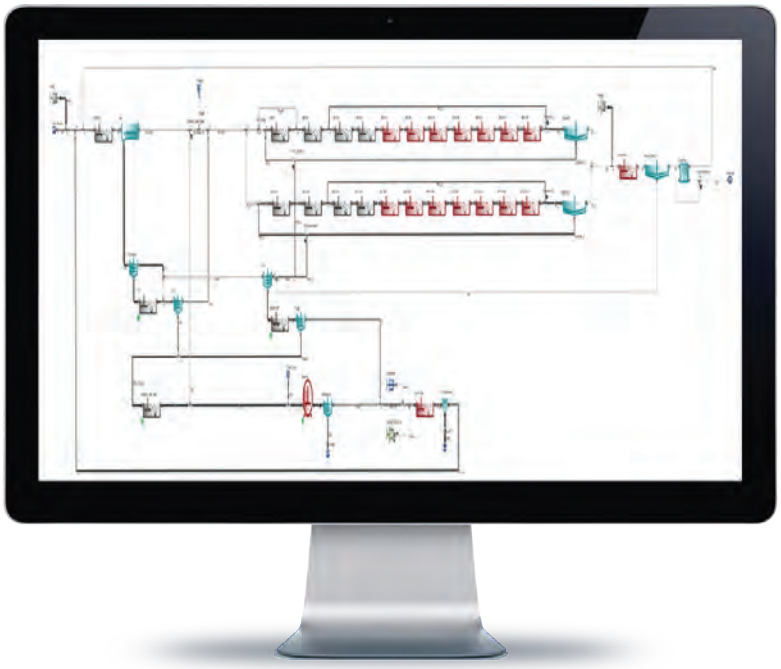
Ultimately, conveyance capital improvements were selected that emphasized the following:

- Reduced environmental impact or opportunity for environmental enhancement.
- Reduced public impact.
- Balance of capacity upgrades, wet weather flow reduction, and infrastructure rehabilitation.
- Opportunities for dual use infrastructure (conveyance capacity in winter, wastewater reuse capacity in summer).

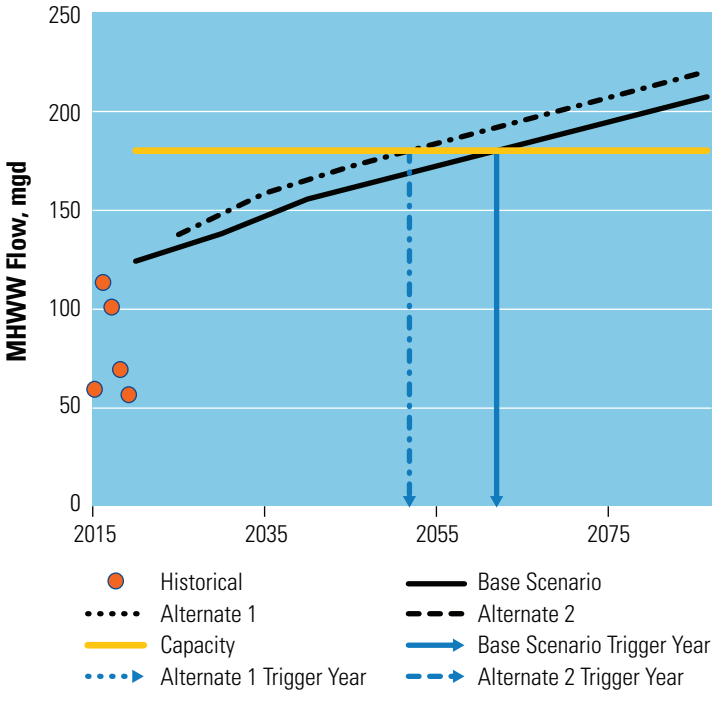
"Living" Plan

One of the key objectives of this planning effort was to create a flexible, dynamic Plan that can be adapted based on actual growth, regulatory developments, and process performance. The objective was met by working with the District to develop the following tools to facilitate updating dynamic information and viewing the corresponding results:

- **Flows and Loads.** Excel based spreadsheet to update flows and loads and assess up to two alternate growth scenarios.
- **Process Model.** The updated flows and loads or alternate growth scenarios can be run through the District's calibrated Sumo model to determine the impacts of these changes on the solids balance for the AWWTF. An interface was created to allow for a streamlined process to update the process models based on changes to influent flows and loads.
- **Process Capacity Spreadsheet.** The mass balance information is exported from the Sumo models and used to evaluate unit process capacity and the corresponding capacity trigger year. The Process Capacity Spreadsheet creates trigger plots for each unit process and creates capacity and trigger year outputs for the Power BI dashboard user interface.

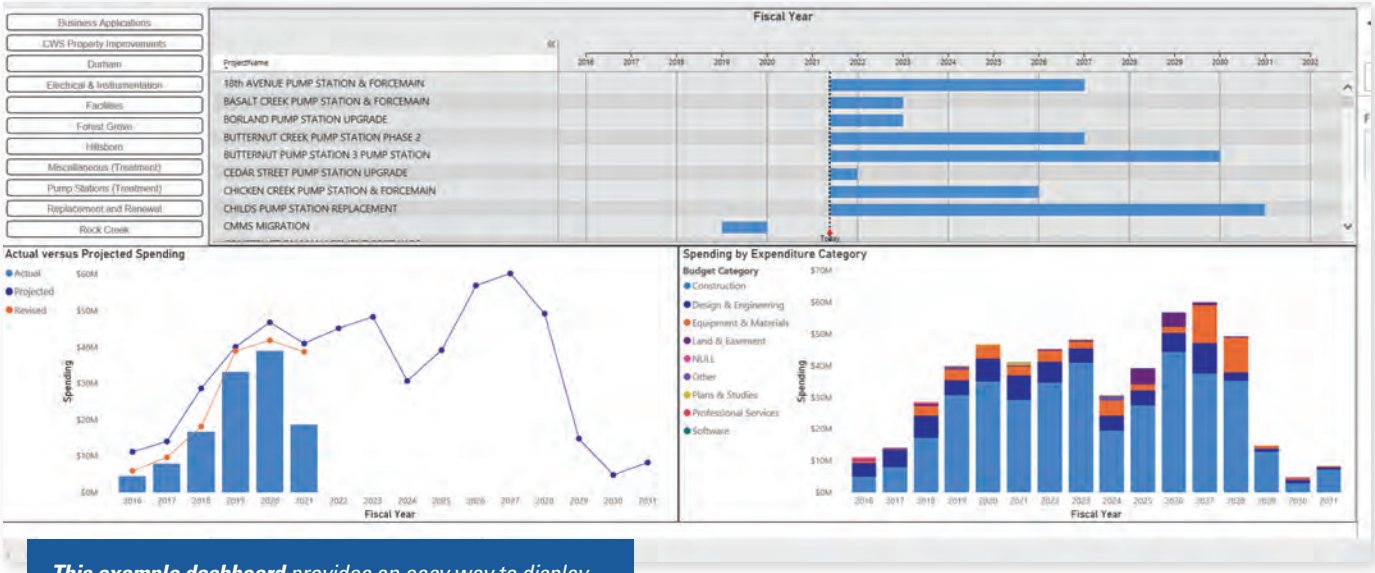


***The District will** use the calibrated Sumo model of the Durham AWWTF to evaluate solids balance impacts based on alternate growth scenarios.*



***Trigger plots for** each unit process show the timing impact of growth scenarios on process capacity.*

- **Power BI Interface.** An interface was created using the Power BI program to synthesize information from each of the tools described above along with the District's financial data into an easily assessable viewing platform. The Power BI dashboards display information on flows and loads, process capacity, and alternate growth scenarios, along with information on budgeted and actual spending for each of the Districts projects. The Power BI interface will automatically pull in the latest data from these sources and provides a dynamic and flexible implementation of the Plan. Although the Power BI dashboard was initially built based on information from Durham AWWTF, it is flexible to incorporate this same information from each of the District's plants and the collection system.



This example dashboard *provides an easy way to display critical information for the Durham facility.*

Recommended Improvements

Alternatives were developed to address deficiencies found within the collection system and the Durham AWWTF with respect to growth, changing regulations and infrastructure condition. These alternatives were evaluated based on the Plan's goals to select recommended improvements for the 20-year planning period. The following section summarizes these recommended improvements for the collection system and for the Durham AWWTF.

Recommended Conveyance System Improvements

The conveyance system recommended improvements are divided into those addressing deficiencies in infrastructure condition and those addressing deficiencies in capacity as a result of growth within the collection system, expansion to new growth areas or increased wet weather flows.

Conveyance System Improvements – Condition and Wet Weather (within 10 years)

1 Wet Weather Flow Reduction Program

- Targets rehabilitation in the local pipes and laterals to prolong life of infrastructure.
- Collaboration with member cities to fund and implement (50/50).
- Optimized balance of wet weather flow reduction with capacity improvements allows reduced improvement sizing to the Metzger Trunk and Fanno Wet Weather Pump Station.

2 Fanno Creek Interceptor Rehabilitation

- Pipeline in Fanno Creek corridor (~5 miles).
- Trenchless rehabilitation to minimize impact to creek corridor.
- Reduces risk of pipeline structural failure and groundwater intrusion.

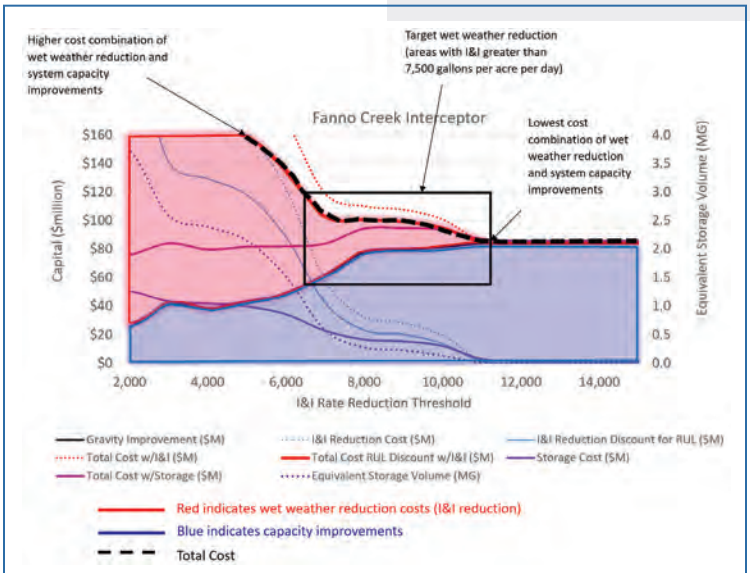
3 Metzger Trunk Pipeline Upsizing

- Capacity improvement to reduce risk of sewer overflows.
- Paired with wet weather flow reduction targets.
- Opportunity to consider partnering opportunities for adjacent land access for environmental enhancement.
- Trenchless construction under Metro transit line.

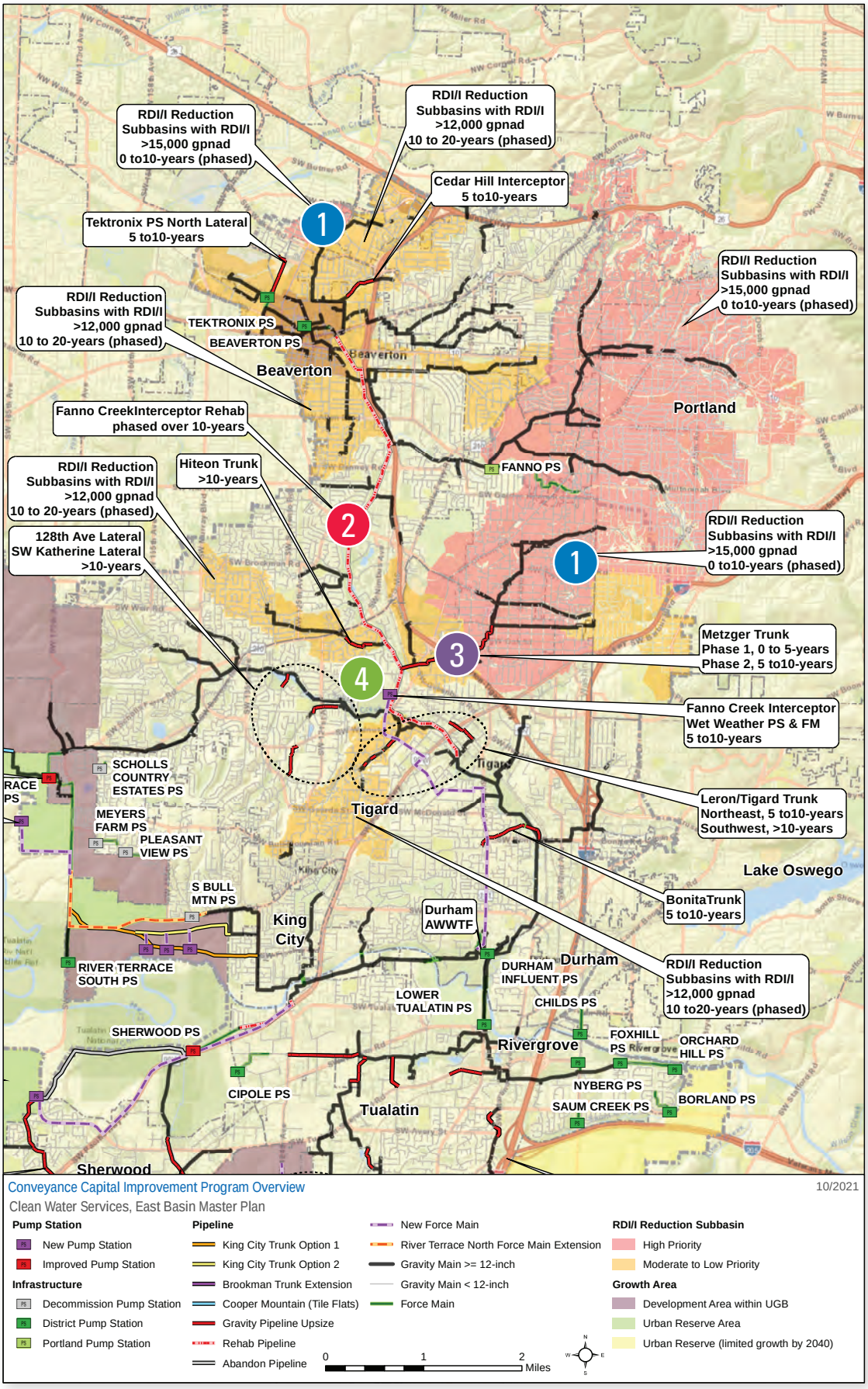
4 Fanno Wet Weather Pump Station and Force Mains

- Reduces risk of sewer overflow in creek corridors during winter season.
- Minimizes pipeline construction, environmental and public impact in Fanno Creek corridor including heavily used trailways.
- Dual use system utilizes force mains for wet weather capacity in the winter and recycled water from treatment plant to new customers in summer also reducing temperature impact on Tualatin River.
- Opportunity to collaborate location with city park improvements
- Adds resiliency in conveyance system for seismic risk.

Rainfall derived infiltration and inflow (referred to as RDI/I or I&I) is the component of sewer flow that occurs in the system as a result of rainfall or groundwater entering through cracks or defects in sewer pipelines and other access structures.



***Fanno Creek Interceptor** evaluation identified the optimal I&I reduction threshold for highest benefit/cost.*



Conveyance Capital Improvement Program Overview

10/2021

Clean Water Services, East Basin Master Plan

Pump Station
- New Pump Station
- Improved Pump Station

Infrastructure
- Decommission Pump Station
- District Pump Station
- Portland Pump Station

Pipeline
- King City Trunk Option 1
- King City Trunk Option 2
- Brookman Trunk Extension
- Cooper Mountain (Tile Flats)
- Gravity Pipeline Upsize
- Rehab Pipeline
- Abandon Pipeline
- New Force Main
- River Terrace North Force Main Extension
- Gravity Main >= 12-inch
- Gravity Main < 12-inch
- Force Main

RDI/I Reduction Subbasin
- High Priority
- Moderate to Low Priority

Growth Area
- Development Area within UGB
- Urban Reserve Area
- Urban Reserve (limited growth by 2040)

0 1 2 Miles

Conveyance System Improvements – Growth (within 10 years)

The District engaged in a collaborative process with member cities to coordinate on master planning goals and timing of development.

1 Beaverton, Tigard, King City

- Opportunity to collaborate with King City for new trunk through Beef Bend Planning Area.
- Scholl's County Estates, Meyers Farms, and Pleasant View pump stations to be decommissioned to offset construction of new local pump stations.
- Tile Flats Pump Station to serve areas in Cooper Mountain.

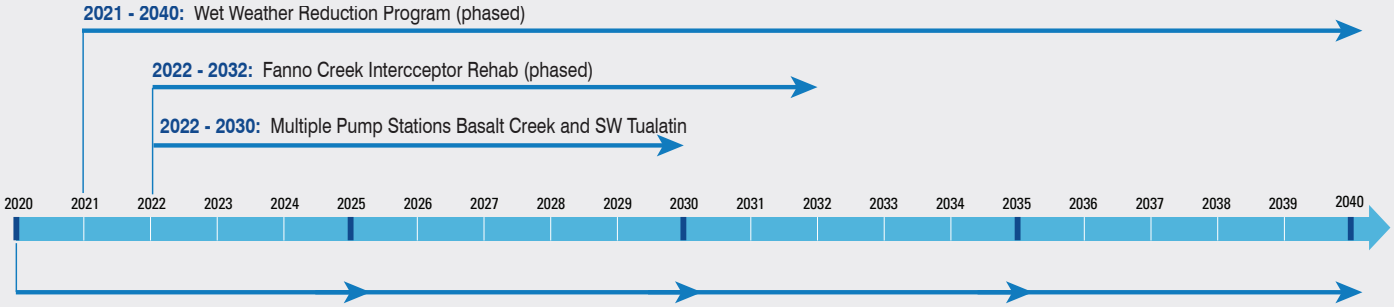
2 Sherwood

- Chicken Creek Pump station planned for western urban reserve expansion which will allow for decommissioning of trunk sewer through wildlife refuge.
- Brookman Trunk extension serving Brookman and West Sherwood UGB expansions.

3 Tualatin

- Local pump stations required to serve Basalt Creek and Southwest Tualatin.
- New or upsized gravity trunks.

Conveyance System Improvements



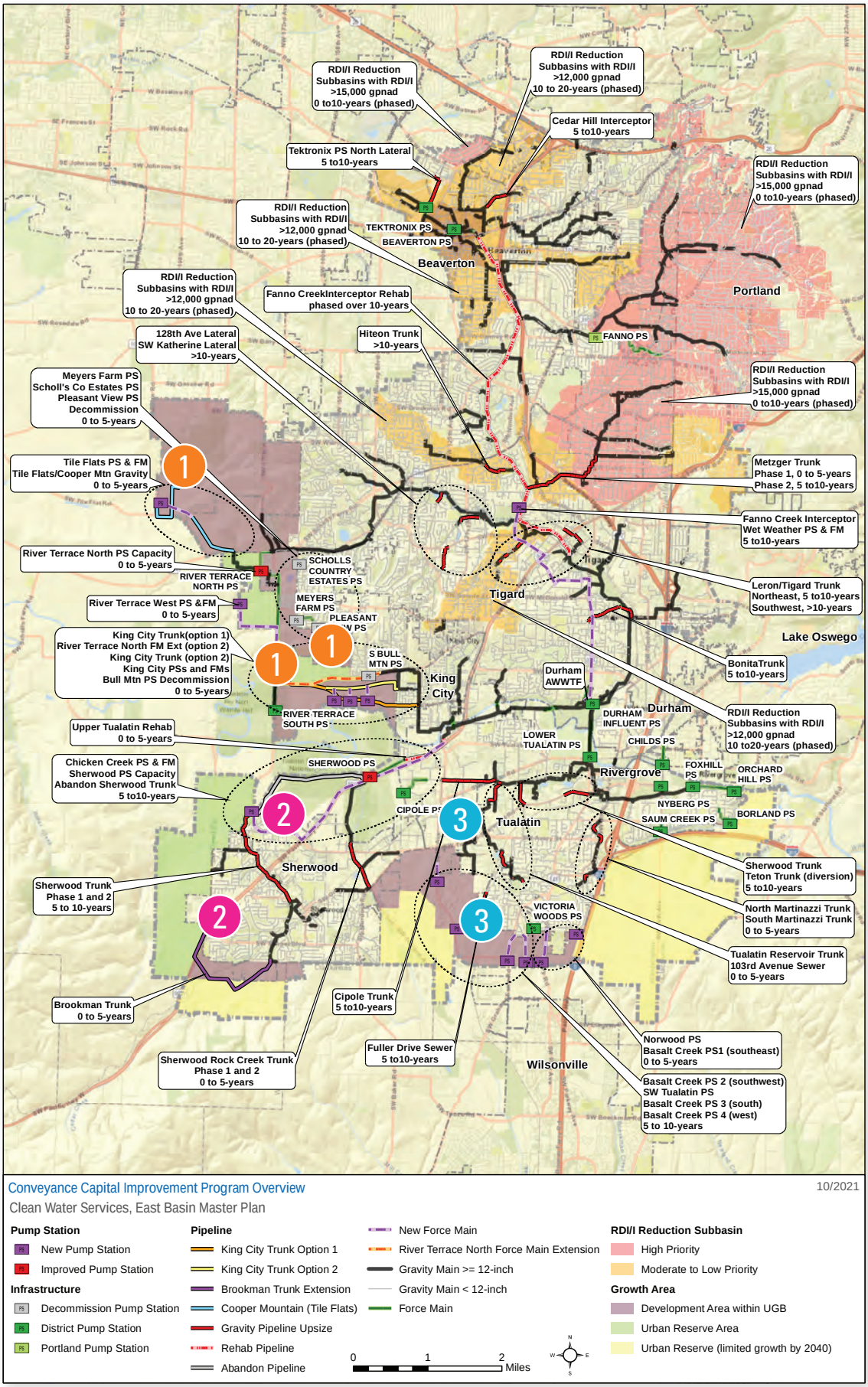
2022: Upper Tualatin Interceptor Rehab
Sherwood Rock Creek Trunk (phase 1)
Meyer's Farm Pump Station Decommission
2023: North Martinazzi Trunk (Tualatin)
Scholl's County Estates Pump Station Decommission
2024: Sherwood Rock Creek Trunk (phase 2)
2025: Brookman Trunk (Sherwood)
Metzger Trunk (phase 1)
King City Trunk or River Terrace North Force Main
River Terrace North Pump Station Upgrades
Tualatin Reservoir Trunk
Tile Flats Pump Station and Force Main
Cooper Mountain Gravity Pipelines (Beaverton)
River Terrace West Pump Station and Force Main
103rd Ave Trunk (Tualatin)
South Martinazzi Trunk (phase 2, Tualatin)
Pleasant View Pump Station Decommission
Bull Mountain Pump Station Decommission

2027: Metzger Trunk (phase 2)
Tektronix Pump Station North Lateral (Beaverton)
Leron/Tigard Trunk Northeast (Tigard)
Fuller Drive Sewer (Tualatin)
2028: Chicken Creek Pump Station and Force Main
Sherwood Pump Station Capacity
Abandon portion Sherwood Trunk
2029: Sherwood Trunk (phase 1)
Bonita Trunk (Tigard)
2030: Fanno Creek Interceptor Wet Weather Pump Station and Force Mains
Sherwood Trunk (phase 2)
Cedar Hill Interceptor (Beaverton)
Sherwood Trunk (Tualatin)
Teton Trunk Diversion (Tualatin)
Cipole/Bluff Trunk (Tualatin)

2033: 128th Ave Lateral (Tigard)
2035: SW Katerhine Lateral (Tigard)

2038: Hiteon Trunk (Tigard)
2040: Leron/Tigard Trunk Southwest (Tigard)

**Dates represent estimated time of project completion.*



Conveyance Capital Improvement Program Overview

Clean Water Services, East Basin Master Plan

10/2021

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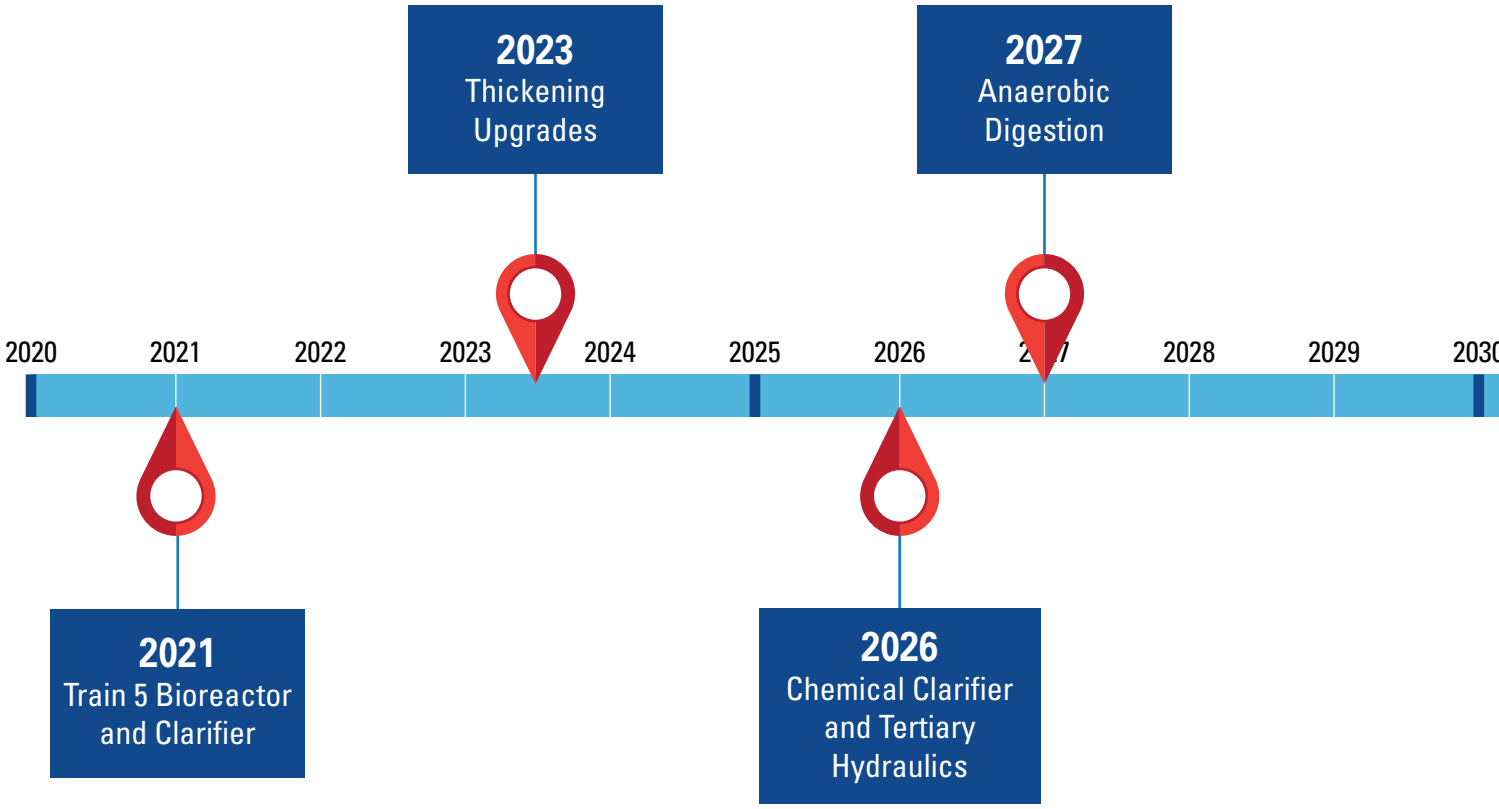
- Development Area within UGB
- Urban Reserve Area
- Urban Reserve (limited growth by 2040)

Durham AWWTF Improvements

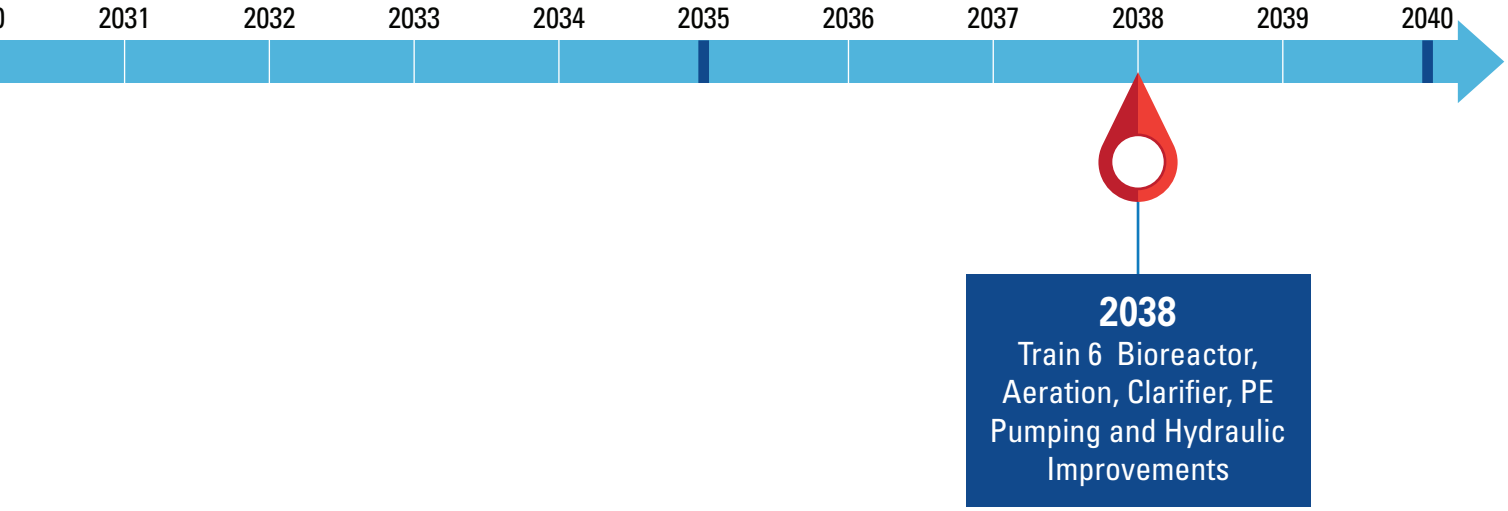


2021 – Secondary Expansion (Train 5)

- ✓ **Capacity.** A fifth secondary train consisting of an aeration basin and secondary clarifier has been constructed and was brought into service in May of 2021.
- ✓ **Flexibility.** This aeration basin is designed with the best industry knowledge for achieving stable biological phosphorus removal. The basin includes larger unaerated volumes and can operate in three different process configurations.
- ✓ **Decreased chemicals.** These improvements will provide a more stable biological phosphorus removal process, allowing the District to meet effluent limits with less chemical addition and increased struvite harvesting.

2023 –Thickening Expansion

- ✓ **Low-cost thickening and WASSTRIP expansion:** The District has completed the design of a mechanical WAS thickener to replace the current gravity thickening process. Additionally, the existing WASSTRIP process, which is currently housed in one gravity thickener, will be moved to a larger unused digester in the DC1 complex. This will provide a low-cost expansion of both the WAS thickening and the WASSTRIP processes. These projects will free up two gravity thickeners to provide additional primary sludge fermentation and thickening capacity at a relatively low cost.
- ✓ **Reliable phosphorus removal.** In addition, the District also completed a project to use waste heat from the cogeneration process to heat the primary sludge fermentation process. Increasing the temperature of the fermentation process allows for increased generation of volatile fatty acids which when added back to the secondary process, allow for a more stable biological phosphorus removal process.



2026 – Chemical Clarifier Optimization

- ✓ **Improved phosphorus removal performance.** Based on uncertainty in future effluent phosphorus limits, the Plan recommends two alternative paths forward. If future effluent limits remain unchanged, the District will construct the full planned modifications to the chemical clarifiers. However, if the effluent limits are more relaxed, the District can save costs by implementing only select modifications.

2027 – Anaerobic Digestion Expansion

- ✓ **Capacity.** An expansion to the District's anaerobic digestion capacity will be required by 2027. The Plan conducted a robust evaluation of different digestion technologies, including considerations for producing Class A biosolids along with potential to destroy PFAS compounds. Since future solids regulations are unclear, the Plan recommends continuing with conventional anaerobic digestion.

2038 – Secondary Expansion (Train 6)

- ✓ **Capacity.** Towards the end of the planning period, an additional secondary train will be required to provide sufficient nitrification capacity during the dry weather season. In conjunction with this expansion, the primary effluent pump station will also need to be expanded to allow for increased peak flows to be conveyed to the secondary process.

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Clean Water Services

Clean Water Services Advisory Commission Meeting Summary

Date: November 10, 2021

Location: The meeting was conducted on Webex

Attendance

Attending the meeting from CWAC:

- Tony Weller (Homebuilder-Developer 1), Commission Chair
- Mike McKillip (District 3/Rogers), Commission Vice Chair
- Alex Phan (District 1)
- Fatima Taha (At-Large/Harrington)
- George Marsh (Agriculture 1)
- Jan Wilson (Environment 1)
- Lori Hennings (Environment 2)
- Matt Wellner (Homebuilder-Developer 2)
- Terry Song (Business 1)
- Sherilyn Lombos (Cities/nonvoting)
- Diane Taniguchi-Dennis (Clean Water Services Chief Executive Officer/nonvoting)

Absent:

- Alan Jesse (Agriculture 2)
- Andy Duyck (District 4/Willey)
- Stu Peterson (Business 2)

Attending the meeting from Clean Water Services:

- Mark Jockers, Chief of Staff
- Gerald Linder, General Counsel
- Joseph Gall, Chief Utility Relations Officer
- Bob Baumgartner, Regulatory Affairs Director
- Joy Ramirez, Environmental Services Supervisor
- Stephanie Morrison, Office Manager
- Shannon Huggins, Public Involvement Coordinator
- Chris White, Public Involvement Coordinator
- Jody Newcomer, Technical Editor & Communications Specialist
- Tracy Rainey, Senior Policy Analyst

Attending the meeting from the public:

- John Jackson, outgoing Agriculture 1 representative

1. CALL TO ORDER

Tony Weller called the meeting to order at 5:32 p.m.

Stephanie Morrison announced the meeting was being recorded and reviewed best practices for Webex meetings. She recognized all attendees.

2. RECOGNITION OF OUTGOING COMMISSION MEMBERS

Mark Jockers recognized the outgoing CWAC members. John Jackson was appointed to CWAC in 2013 as an Agriculture representative, Molly Brown joined in 2007 as a District 2 representative, and Art Larrance was appointed in 2012 to the At-Large position. Jackson commended Clean Water Services for the work it does in the Tualatin Basin and thanked Jockers for the opportunity to participate in CWAC. Brown and Larrance were unable to join the meeting, and Larrance sent a message thanking fellow commissioners.

3. REVIEW/APPROVAL OF MEETING NOTES

There were no other comments regarding the notes from the meeting on June 9, 2021. The notes were approved.

4. NPDES PERMIT APPLICATION STATUS AND UPDATE

- Bob Baumgartner, Regulatory Affairs Director

The National Pollutant Discharge Elimination Permit is the implementing mechanism for the Clean Water Act. The CWS watershed-based NPDES permit is extremely complex for two reasons:

1. CWS has large water resource recovery facilities that discharge into a relatively small stream.
2. CWS tries to leverage some of the flexibility available under the Clean Water Act to achieve significant water quality benefits, which results in the permit containing a lot of reporting.

CWS goes through a permit renewal ostensibly every five years. CWS submitted a renewal application in December 2020 for its watershed-based NPDES permit, which expired on May 31, 2021. That permit has been administratively extended until a new permit is issued. DEQ is working with CWS to resolve a number of difficult issues.

As part of the permit renewal process, staff updated plans for biosolids, reuse, thermal load management and mercury minimization; the nondomestic waste ordinance and the pretreatment manual.

The CWS permit integrates the four water resource recovery facilities and the stormwater program. It includes an innovative trading program including stream enhancement and flow

enhancement in the mainstem and tributaries, and gives CWS the ability to share loads between plants.

CWS developed an integrated plan that articulates strategies beyond the five permit-cycle to address long-term regulatory challenges. CWS has proposed operational improvements in several areas including removing aluminum, a change in how phosphorus recovery and treatment occurs, flexibility for trading, and operating the Forest Grove Water Resource Recovery Facility and Natural Treatment System. CWS also wants to integrate stormwater approaches for stream enhancement and restoration into the regulatory process.

Historically, the Environmental Protection Agency requires an "integrated plan" as a response to an enforcement action. That's not the case with CWS, which is in compliance with existing permits. CWS wants to work with DEQ to plan more strategically, to remain in compliance, and look ahead to adjust to population growth and climate change. CWS is the first entity in the state and one of the first in the EPA Region 10 to take this approach.

CWS is working on several key issues with DEQ:

- **Flow-based limits for ammonia.**
- **Toxics, disinfection byproducts.** Staff developed a strategy to manage the ammonia that is discharged from CWS facilities to minimize the formation of disinfection byproducts. Lab staff also developed methods to measure disinfection byproducts at much lower levels than available through standard methodology
- **Temperature and thermal plumes,** which can inhibit fish migration.
- **Forest Grove Water Resource Recovery Facility and Natural Treatment System operations.**
- **Copper and aluminum criteria.**
- **Stormwater program requirements.** DEQ recently issued Phase I MS4 (municipal separate storm sewer system) permits and CWS expects to see many of the same conditions in its new permit. One condition is a requirement for stormwater programs to meet water quality standards and CWS is figuring out how to best implement this provision.

CWS faces a number of challenges — replacing aging infrastructure, growth, regulatory requirements, water resource limitations, climate change impacts, and maintaining a sustainable rate structure. Water reuse is a big part of the future at CWS and staff worked with DEQ to expand reuse for watershed enhancement.

QUESTIONS, COMMENTS

As you work through issues with DEQ, is someone working with Tualatin Riverkeepers and environmental groups to address their concerns?

Yes. We've reached out to Tualatin Riverkeepers and Northwest Environmental Advocates on key issues.

Relative to stormwater management do you think we may be seeing comments or recommendations from DEQ or EPA regarding how we manage our ponds relative to detention and water quality? Do you anticipate another update to the Design and Construction Standards? What details do you think we might have to address relative to ponds?

We're explaining our stormwater program to DEQ, and explaining why we think the program is effective. We're trying to understand if DEQ is uncomfortable with any aspects of the program so we can determine next steps.

The CWS stormwater program is different from other stormwater programs in a number of ways. For example, building the relationship between stream enhancement and the water that comes off a development is unique to CWS. We approach stormwater differently than other organizations. When the first TMDL was issued in the late 1980s, there was concern about how much phosphorus could be carried with a summer storm. DEQ identified a design storm as part of an official rule, which we incorporated in our programs. It's still the basis of our program. The old design storm still meets our needs and we're explaining that to DEQ.

We are working to understand the scope of changes that may be necessary to the Design and Construction Standards and I don't want to guess at the outcome. We'll provide updates on this topic.

But your initial reaction is that DEQ has been receptive to the basinwide approach, the stream enhancement work and those concepts playing a role in our water quality requirements?

Yes. Very positive.

How are you going to handle illicit discharges?

We handle those predominantly on a complaint basis and we coordinate with cities as needed. There is an enforcement component to illicit discharges, but most of what we do is education. We also have a screening program to identify illicit discharges, where we inspect stormwater outfalls during the dry season to determine whether there are any illicit discharges. We're building the infrastructure to track illicit discharges so we don't lose track of them as we interact with the cities.

That's actually what I was asking. Are we tracking it in some way to know if it's becoming more of a problem or less of a problem or just a constant problem that we're able to handle.

5. LOCAL LIMITS

- Joy Ramirez, Environmental Services Supervisor
- Bob Baumgartner, Regulatory Affairs Director

The CWS Industrial Pretreatment Program develops local limits for industrial discharge of specific chemicals to its sanitary system to keep workers safe and protect water quality, infrastructure investments, and the biological processes at treatment facilities. The program is highly regulated for its parameters specific to different types of industries. The EPA defines federal limits for industries such as metal finishers, pharmaceuticals or semiconductors.

As part of the federal pretreatment program, Clean Water Services develops a local program specific to its infrastructure with a focus on cost recovery. CWS recovers costs based on the strength and volume of wastewater. The NPDES permit requires a review of the local limits. CWS last did a local limits study in 2008, before it built the natural treatment system in Forest Grove.

Staff collected and analyzed several years' worth of data for its four water resource recovery facilities and the natural treatment system to properly account for growth in the service area. Each plant is set up differently to accommodate the industries, businesses and residents in their area.

CWS considered how changes to local limits will impact industries. Will industries face potential compliance issues? Are there new pollutants of concern? CWS also considered whether its allocation methodology is equitable. Should it assign the same limits to every industry or allocate for select sources? Should it set the lowest limit for every industry or tailor limits specific to the needs of the water resource recovery facility that receives the discharge? CWS staff has been talking with industries throughout this process

The proposed new limits are stricter than current limits, and they're the same for every water resource recovery facility with the exception of two parameters at Forest Grove — copper and molybdenum. Local limits are lower for copper at the Forest Grove facility because of the unique features of this facility and the industrial contributions. Specific allocations were made for copper and molybdenum at the Rock Creek facility to select industries.

	Current Local Limit (mg/L, except pH)	Proposed Local Limit (mg/L, except pH)		Proposed Local Limit (lbs./day)
Pollutant	Durham, Rock Creek, Hillsboro and Forest Grove Facilities	Durham, Rock Creek, and Hillsboro Facilities	Forest Grove Facility	Applied to Specific SIUs
Arsenic	0.34	0.23	0.23	
Cadmium	0.19	0.13	0.13	
Chromium	10.2	6.17	6.17	
Copper	2.71	2.71	1.15[1]	8.00[2]
Cyanide	1.38	1.17	1.17	
Lead	1.12	0.7	0.7	
Mercury	0.008	0.006	0.006	
Molybdenum	1.06	0.56	0.56	4.26[3]
Nickel	2.31	2.26	2.26	
Selenium	0.97	0.35	0.35	
Silver	0.09	0.06	0.06	
Zinc	3.28	1.87	1.87	
pH (S.U.)	6-11	6 - 11	6 - 11	
FOG	BMP	BMP	BMP	

[1] To be proposed as a mass limit of 1.24 lb. /day for the only contributory Significant Industrial User

[2] Allocation to be distributed to two semiconductor facilities that discharge to the Rock Creek facility

[3] Allocation to be distributed to two semiconductor facilities that discharge to the Rock Creek facility and a metal finisher that discharges to the Hillsboro facility

DEQ granted tentative approval of the proposed limits pending public comment during Oct. 22 to Nov. 22.

QUESTIONS, COMMENTS

Have we received any comments?

One industry asked for clarity about what its allocation would be. We answered the industry's questions and have received no additional comments.

The table showing proposed local limits lists "Current Local Limit (mg/L, except pH)" What is the exception for pH?

pH is measured in Standard Units. The other parameters are measured in milligram per liters.

6. PUBLIC COMMENT

None.

7. ANNOUNCEMENTS, QUESTIONS, COMMENTS

- The next meeting is scheduled for December 8, 2021.
- On November 30 CWS will ask its Board of Directors to charge CWAC with reviewing the East Basin Facility Plan, which includes the Durham Water Resource Recovery Facility and the surrounding area, and making a recommendation back to the Board regarding adoption.
- Weller welcomed the new members and said there are not that many organizations that are as proactive about anticipating the future. He said CWS looks at regulatory compliance through a different lens, considering what's best for the watershed instead of just meeting the letter of the requirements.
- Diane Taniguchi-Dennis noted her appreciation of everyone who serves on CWAC. She especially thanked the outgoing members, Brown, Jackson and Larrance, and welcomed the newest members, George Marsh and Fatima Taha. She said CWS will be bringing some interesting issues to CWAC in the coming months.

I didn't realize that there's an appeals committee. When did we last hear an appeal?

Gerald Linder said the appeals committee was created when stormwater was added to the functions of Unified Sewerage Agency. It was a very active committee in the early 1990s. Since then there have been perhaps two appeals. Often an appeal comes out of a request to interpret an ordinance or policy and understand how it applies to them. Linder said he doesn't recall an appeal in the past 10 years.

Jockers said issues rise to the appeals committee if they can't be resolved at the CEO level. Taniguchi-Dennis is committed to resolving issues before they're elevated to CWAC, as was Bill Gaffi when he was the general manager.

Will the recent passage of the infrastructure bill have any effect on Clean Water Services?

Yes. Some people are calling the bill the largest infrastructure investment since the Eisenhower administration, and experts in the water industry are saying it's the largest federal investment in water infrastructure in history.

There is a major tranche of funding going to the Bureau of Reclamation Safety of Dams program. We expect that funding will accelerate the Safety of Dams work at Scoggins Dam. There's also a substantial investment in reuse. CWS is making a significant pivot to expand the reuse program.

Weller said reuse is a broad topic. What does that mean regarding clean water?

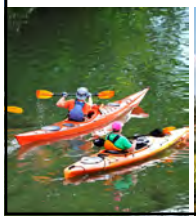
Jockers said when we talk about reuse, we're talking about water reuse. CWS cleans 65 million gallons of water a day. Most is returned to the river, but CWS also provides about 1 million gallons a day in the summer for athletic fields and parks. CWS wants to increase that to 5 million gallons a day by 2025 — 5 in 25.

8. ADJOURNMENT

Weller adjourned the meeting at 6:53 p.m.

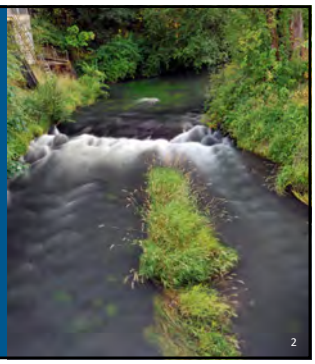
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT RENEWAL

November 10, 2021
Clean Water Services Advisory Commission
Bob Baumgartner, Regulatory Affairs Director



AGENDA

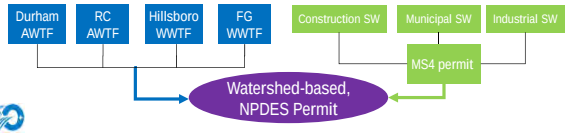
- Background: Watershed-based NPDES permit renewal application
- Integrated Planning approach
- Permit status
- Pathways for collaboration on complex topics
- Outreach and schedule



CWS WATERSHED-BASED NPDES PERMIT

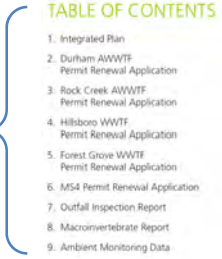
Includes:

- Permits for four wastewater treatment facilities (WWTFs) and municipal stormwater program
- Water quality trading for temperature
- Shared loads for TSS, ammonia and phosphorus among WWTFs
- Flow-based limits



COMPLEX PERMIT RENEWAL APPLICATION

Our application includes nine components



OTHER SUPPORTING MATERIALS

- Thermal Load Management Plan (aka Temperature Management Plan)
- Mercury Minimization Plan
- Edits to the permit and supporting documents
- Memo on monitoring reduction
- Strategy to minimize formation of disinfection byproducts
- Flow-based ammonia limits

INTEGRATED PLAN

- Identifies long-term regulatory challenges we face
- Communicates goals to regulators and stakeholders
- Describes alternative strategies and activities to achieve the goals
- Complements other planning efforts

INTEGRATED PLAN: EPA REPORT

- From the June 2021 EPA report on Integrated Planning to Congress:
  "As municipalities continue to improve their clean water infrastructure, they must successfully navigate and address issues, such as changing rainfall patterns and intensities, population growth and expanding service areas, aging infrastructure, competing priorities for public funds, and increasingly disparate impacts on their full range of ratepayers."

CHALLENGES

- Maintaining/replacing aging infrastructure
- Anticipated growth
- Regulatory requirements
- Water resource limitations
- Climate change impacts
- Sustainable rate structure

INTEGRATED PLANNING PROGRAMMATIC GOALS

- Wastewater Treatment
  - Sustainable treatment processes
  - Natural infrastructure
- Stormwater Management
  - Achieve broader outcomes
  - Integrate stormwater and stream enhancement activities
- Watershed enhancement activities
  - Reuse through watershed enhancement
  - Flow enhancement through exchanges and instream leases
- Technology considerations
  - Continue to incorporate real-time instruments to manage systems
  - Continue innovation and technology

WATERSHED-BASED NPDES PERMIT STATUS

- Current permit issued April 22, 2016
- Effective June 1, 2016
- Renewal application submitted December 1, 2020
- Permit expiration date: May 31, 2021
- With the submittal of the renewal application, permit is administratively extended
- CWS operates under the 2016 permit until DEQ takes action

PERMIT OBJECTIVES

- Continued implementation of watershed-based approach
- Operational improvements
- Expand recycled water use for environmental restoration
- Stream enhancement approach for subbasin stormwater
- Integrated Planning long-term narrative

KEY PERMIT ISSUES

- Flow-based limits for ammonia
- Toxics, disinfection byproducts
- Temperature and thermal plumes
- Forest Grove WWTF and Natural Treatment System operations
- Copper and aluminum criteria
- Stormwater program requirements

STORMWATER PROGRAM

- Final MS4 permits for Phase 1 communities issued in September 2021
- Expect provisions will be incorporated into the watershed-based NPDES permit upon renewal
- New MS4 permits
  - Continue to require a management practice-based approach for municipal stormwater discharges
  - Continue to require control of pollutants to the maximum extent practicable (MEP standard)
  - Continue to require implementation of stormwater management practices in key program areas
  - There are some new/expanded provisions

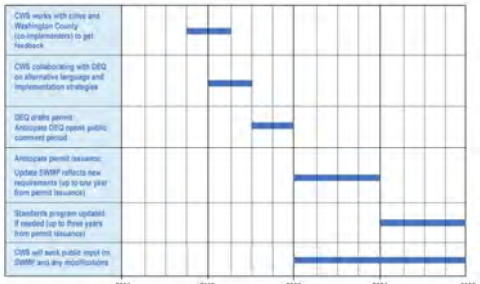
13

NEW MUNICIPAL STORMWATER (MS4) PERMIT PROVISIONS

- Schedule A: General provisions
  - Water quality standards
- Schedule A: Management Practices
  - Public education and outreach
  - Public involvement and participation
  - Illicit discharge detection and elimination (IDDE)
  - Construction site runoff control
  - Post-construction runoff control
  - Industrial/commercial stormwater
  - Pollution prevention for municipal operations

14

OUTREACH TIMELINE



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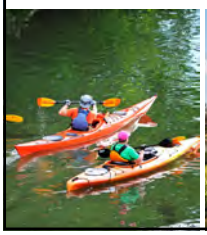
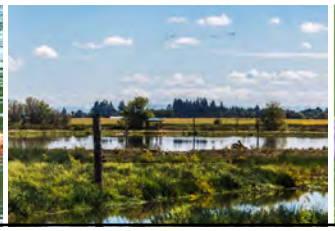
QUESTIONS?

LOCAL LIMITS UPDATE

November 10, 2021

Clean Water Services Advisory Commission
Joy Ramirez, Environmental Services Supervisor
Bob Baumgartner, Regulatory Affairs Director


AGENDA

- Industrial Pretreatment Program – Definition and Purpose
- What are Local Limits?
- Current Status of Industrial Pretreatment Program
- Next Steps

INDUSTRIAL PRETREATMENT

- Regulates release of industrial wastewater discharged to the Publicly Owned Treatment Works (POTW) in order to protect:
  - Public health
  - Worker safety
  - Public infrastructure
  - The environment
- Highly regulated, specific parameters
- Specific discharge limits established by EPA for certain industrial categories; customized limits for specific chemicals and substances based on unique local situations

CWS AND FEDERAL INDUSTRIAL LIMITS

- CWS (local) programs
  - Obtain cost recovery
  - Protect health, safety and beneficial reuse
- Federally mandated limits.
  - Establish categorical limits for specific industries, such as metal finishers and semiconductors. Require minimum technology
  - Prohibit dangerous conditions and outcomes
  - Prohibit certain toxic industries from discharging
  - Include local limits, direct CWS to develop these

WHY NOW?

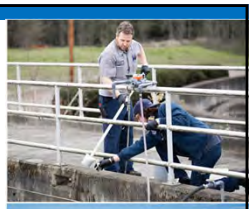
- Current NPDES permit
  - Requires local limits review
  - Prior to expected administrative extension of permit
- Substantial growth in industrial and domestic sources
- Must meet new federal and state water quality standards
- Increased flow from water resource and recovery facilities
- New discharges: Year-round discharge from Forest Grove facility related to natural treatment system
- Concerns about industrial impacts on ability to remove ammonia
  - Chemicals that temporarily stop nitrification reaction

CHALLENGES

- Complex proposed local limits
  - Assessed risk
  - Assessed potential compliance by industrial sources
  - New pollutants of concern
- Equitable distribution
  - Uniform
  - Contributing sources
  - Individual for select sources

CURRENT STATUS: LOCAL PROGRAM UPDATES

- PFAS
  - Ongoing monitoring
  - One major source reduction
  - Identified a major PFOA source
- Reuse program
  - Collaborative approach
- Cost recovery
  - Ongoing



CURRENT STATUS: PROPOSED LOCAL LIMITS

Pollutant	Current Local Limit (mg/L, except pH)	Proposed Local Limit (mg/L, except pH)		Proposed Local Limit (lbs./day)
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Mercury	0.008	0.006	0.006	
Molybdenum	1.06	0.56	0.56	4.26[3]
Nickel	2.31	2.26	2.26	
Selenium	0.97	0.35	0.35	
Silver	0.09	0.06	0.06	
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[2] Allocation to be distributed to two semiconductor facilities that discharge to the Rock Creek Facility
[3] Allocation to be distributed to two semiconductor facilities that discharge to the Rock Creek Facility and a metal finisher that discharges to the Hillsboro Facility

NEXT STEPS: HOLD FORMAL PUBLIC COMMENT PERIOD

- ☑ General outreach to all industrial sources and interested parties
- ☑ Received initial stakeholder input and determined any modifications to proposed local limits, as appropriate
- ☑ Submitted Local Limits evaluation report to DEQ
- ❑ Complete formal public notification and comment period
- ❑ Submit any revisions for DEQ final approval

QUESTIONS?