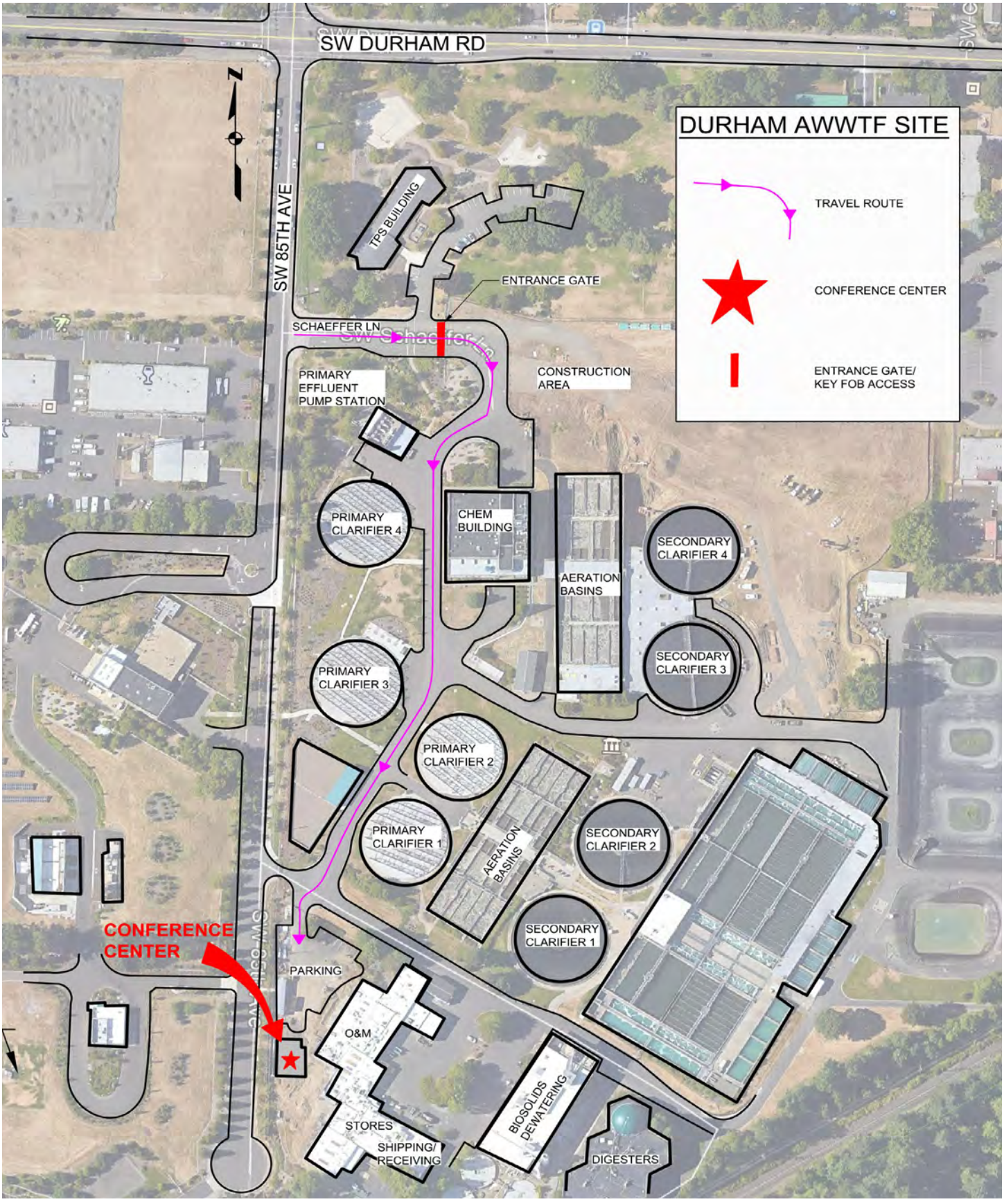
Clean Water Services
Since 1970

Clean Water Services
Board of Directors Learning

October 18, 20 and 21, 2021

Days 1 & 2
Durham Water Resource Recovery
Facility Conference Center
16060 SW 85th Avenue, Tigard

Day 3
ripl (former TTM building)
1585 Poplar Street, Forest Grove


SW DURHAM RD
SW 85TH AVE
DURHAM AWWTF SITE
TRAVEL ROUTE
CONFERENCE CENTER
ENTRANCE GATE/
KEY FOB ACCESS
TPS BUILDING
ENTRANCE GATE
SCHAEFFER LN
CONSTRUCTION
AREA
PRIMARY
EFFLUENT
PUMP STATION
PRIMARY
CLARIFIER 4
CHEM
BUILDING
AERATION
BASINS
SECONDARY
CLARIFIER 4
SECONDARY
CLARIFIER 3
PRIMARY
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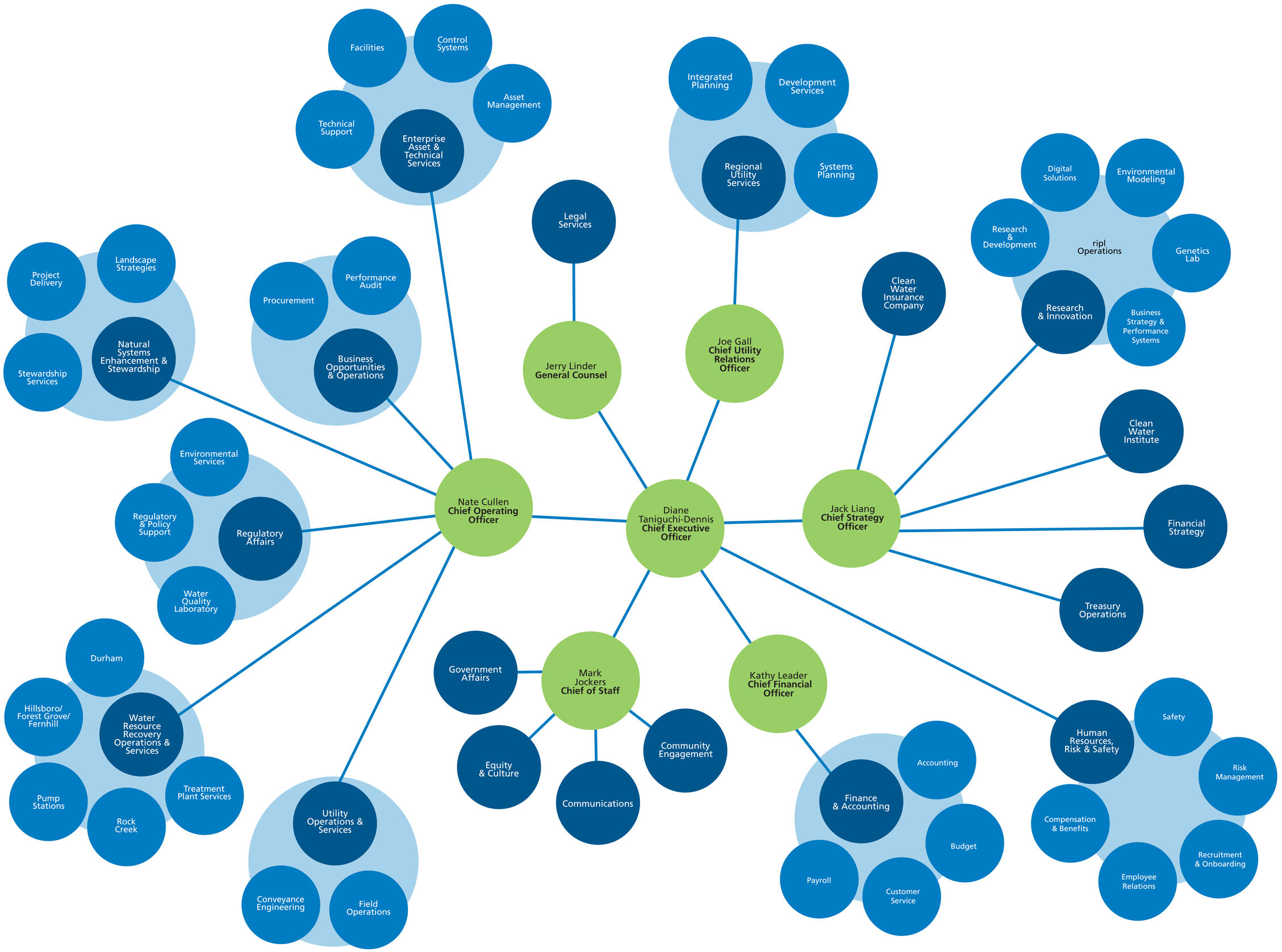
PRIMARY
CLARIFIER 1
AERATION
BASINS
SECONDARY
CLARIFIER 2
SECONDARY
CLARIFIER 1
CONFERENCE
CENTER
PARKING
O&M
STORES
SHIPPING/
RECEIVING
BIOSOLIDS
DEWATERING
DIGESTERS


Facilities
Control Systems
Asset Management
Technical Support
Enterprise Asset & Technical Services
Integrated Planning
Development Services
Regional Utility Services
Systems Planning
Legal Services
Digital Solutions
Environmental Modeling
Research & Development
ripl Operations
Genetics Lab
Research & Innovation
Business Strategy & Performance Systems
Project Delivery
Landscape Strategies
Natural Systems Enhancement & Stewardship
Stewardship Services
Procurement
Performance Audit
Business Opportunities & Operations
Jerry Linder
General Counsel
Joe Gall
Chief Utility Relations Officer
Clean Water Insurance Company
Clean Water Institute
Environmental Services
Regulatory & Policy Support
Regulatory Affairs
Water Quality Laboratory
Nate Cullen
Chief Operating Officer
Diane Taniguchi-Dennis
Chief Executive Officer
Jack Liang
Chief Strategy Officer
Financial Strategy
Treasury Operations
Durham
Hillsboro/ Forest Grove/ Fernhill
Water Resource Recovery Operations & Services
Pump Stations
Rock Creek
Treatment Plant Services
Utility Operations & Services
Conveyance Engineering
Field Operations
Government Affairs
Mark Jockers
Chief of Staff
Equity & Culture
Communications
Community Engagement
Kathy Leader
Chief Financial Officer
Finance & Accounting
Accounting
Budget
Payroll
Customer Service
Human Resources, Risk & Safety
Safety
Risk Management
Compensation & Benefits
Recruitment & Onboarding
Employee Relations

DAY 1

Monday, October 18, 9 a.m. to 2 p.m.
Durham Water Resource Recovery Facility Conference Center

Learning Themes and Objectives

- Learning Water Resource Recovery Operations, Innovations and Infrastructure Investments
- Research and Innovation
- Contributing to the Region's Environmental and Economic Vitality

9 a.m.	Welcome, introductions, overview of learning
9:20 a.m.	Water Resource Recovery investments, challenges and opportunities Biological Phosphorus Removal (BPR) research and innovation • Facility design and optimization • Regulatory innovation, water quality improvements and sustainability Peak Performance Awards
10:20 a.m.	Tour of Durham Water Resource Recovery Facility: Putting planning, design and research into practice
12:20 p.m.	Lunch
1 p.m.	East Basin Master Plan: Identifying the conveyance and treatment infrastructure needs of the next 20 years
2 p.m.	Adjourn

Water Resource Recovery Investments, Challenges and Opportunities

- **Nate Cullen,** Chief Operating Officer
- **Logan Olds,** Water Resource Recovery Services Manager

Biological Phosphorus Removal Research and Innovation

FACILITY DESIGN AND OPTIMIZATION

- **Adrienne Menniti,** Principal Engineer-Process
- **Peter Schauer,** Principal Engineer-Process

Clean Water Services removes phosphorus at its resource recovery facilities to meet a regulatory need to maintain the health of the Tualatin River watershed and to take advantage of a business opportunity for nutrient recovery. Biological phosphorus removal (BPR) has been a cornerstone of the CWS phosphorus management strategy for decades. While some chemical phosphorus removal is necessary, limiting chemical removal of phosphorus is cost-effective and sustainable. Reducing chemical reliance maximizes phosphorus recovery and lessens our overall carbon footprint by limiting chemical manufacturing and transport.

The BPR process historically operates stably over long periods of time, only to become upset at critical times during the phosphorus permit compliance season. The Technology Development and Research Group has been conducting extensive research on BPR stability to support efficient and reliable resource recovery facility operation. The three goals of the BPR research program are to:

- Understand the factors affecting BPR stability.
- Predict conditions where BPR upsets will occur.
- Implement process controls and configurations that lead to improved BPR stability.

The new train 5 aeration basin at Durham represents a state-of-the-art design to achieve stable BPR. This presentation will introduce the BPR research program and summarize the train 5 design innovations.

Biological Phosphorus Removal Research and Innovation

REGULATORY INNOVATION, WATER QUALITY IMPROVEMENTS AND SUSTAINABILITY

- **Bob Baumgartner,** Regulatory Affairs Director

Clean Water Services faces challenges from a growing service area, aging infrastructure needs, increasingly complex regulatory drivers, water resource limitations, evolving climate change impacts, and keeping rates affordable across a range of social and economic strata.

Historically, regulatory approaches focused on a single pollutant for a single problem. Things are more complex than that, and more connected. CWS has some of the most stringent and complex water quality requirements in the nation that require us to provide a higher level of treatment than 98 percent of facilities in the United States before returning water to our small, slow and sensitive river. We must innovate, because the Tualatin River demands it.

Central to this innovation is the use of biological processes to remove phosphorus from wastewater before returning the cleaned water to the Tualatin River. Phosphorus removal is necessary to control algae in the river and meet our permit requirements. CWS pioneered biological phosphorus removal (BPR) as a more sustainable alternative to the use of chemicals to remove this pollutant from wastewater. Previously, we used alum, which in large part is aluminum, to remove phosphorus. The US EPA recently developed a new standard to control aluminum. This created competing demands to meet the aluminum standard while continuing to maintain low algae in the river. We needed to better understand how the river works and use that knowledge to navigate our regulatory requirements.

Not all algae are bad; it's only a problem when there is too much algae. Some algae are harmful and can be toxic, especially to dogs. Other algae are beneficial and provide the base of the food chain in a healthy biological community. As algae grow, they create oxygen needed for a healthy biological community. The Tualatin can use more oxygen.

Flow management has evolved and phosphorus is less important than before. Changes to the Oswego diversion dam and how we manage flow have reduced residence time in the river. That means the time algae have to grow in the river is now days rather than months.

With this understanding, CWS worked with DEQ to develop a regulatory approach that allowed our research team to optimize biological nutrient control. This will allow CWS to:

- Reduce the use of potential toxic pollutions (alum), which has a great benefit of reducing costs and our carbon footprint.
- Use biological treatment rather than rely on alum addition to control phosphorus.
- Better manage flow to help maintain a healthy level of algae that can help improve the dissolved oxygen in the river.
- Continue using the Natural Treatment System, which appears to provide a similar natural removal of phosphorus but can also be managed to help provide beneficial algae to the river.

Managing the river is complicated. We are creating viable, innovative pathways to improve water quality, and we have the understanding and ability to make them work. Our goal is a smaller environmental footprint, less expensive treatment costs, and a better environmental outcome.

Peak Performance Awards

- **Nate Cullen,** Chief Operating Officer
- **Logan Olds,** Water Resource Recovery Services Manager
- **Tom Stow,** Plant Superintendent 3
- **CJ Baxter,** Plant Superintendent 1

The National Association of Clean Water Agencies' Peak Performance Awards program annually recognizes member facilities for excellence in wastewater treatment as measured by compliance with National Pollutant Discharge Elimination System permits. Clean Water Services received two Platinum Awards, one Gold Award and one Silver Award for the 2020 calendar year.

The Rock Creek and Durham facilities each received a Platinum Award, which is given to a facility with a consistent record of full compliance for five consecutive years. Rock Creek has 17 years; Durham has five years. Hillsboro received a second consecutive Gold Award, which is presented to a facility with perfect compliance in a calendar year. Forest Grove had one temperature exceedance and received a Silver Award.

In the period covered by these awards, the four resource recovery facilities navigated nearly 10,000 compliance instances. The staff at the Water Resource Recovery Department worked 24 hours a day, seven days a week to clean more than 24 billion gallons of used water, transforming it into energy, fertilizer and clean water ready for reuse or return to the river.

Tour of Durham Water Resource Recovery Facility

PUTTING PLANNING, DESIGN AND RESEARCH INTO PRACTICE

- **Nate Cullen,** Chief Operating Officer
- **Logan Olds,** Water Resource Recovery Services Manager
- **Noah Harvey,** Operations Supervisor
- **Edher Estrada,** Senior Operator
- **Randy Robbins,** Mechanical Maintenance Supervisor
- **Dan Garbely,** Principal Engineer
- **Mike Idehara,** Senior Engineer
- **Adrienne Mennitti,** Principal Engineer-Process
- **Justine Abrook,** Senior Operations Analyst
- **Jared Kinnear,** Reuse Manager

Clean Water Services

DURHAM WATER RESOURCE RECOVERY

AERIAL VIEW OF DURHAM WATER RESOURCE RECOVERY FACILITY IN TIGARD

Durham Water Resource Recovery Facility, located in Tigard near Cook Park and Tigard High School, is a nationally acclaimed, state-of-the-art facility, serving Washington County residents in the cities of Beaverton, Durham, King City, Sherwood, Tigard, Tualatin, and small portions of southwest Portland and Lake Oswego.

Today, the facility cleans an average of 22 million gallons of used water each day to among the highest safety and quality standards in the nation. Through innovative, advanced technology and processes, the Durham facility treats and removes valuable resources from water collected from homes and businesses. This water flows through a strategic process of liquids and solids recovery. The water is then returned to Washington County's only river – the Tualatin – so clean, it actually improves water quality.

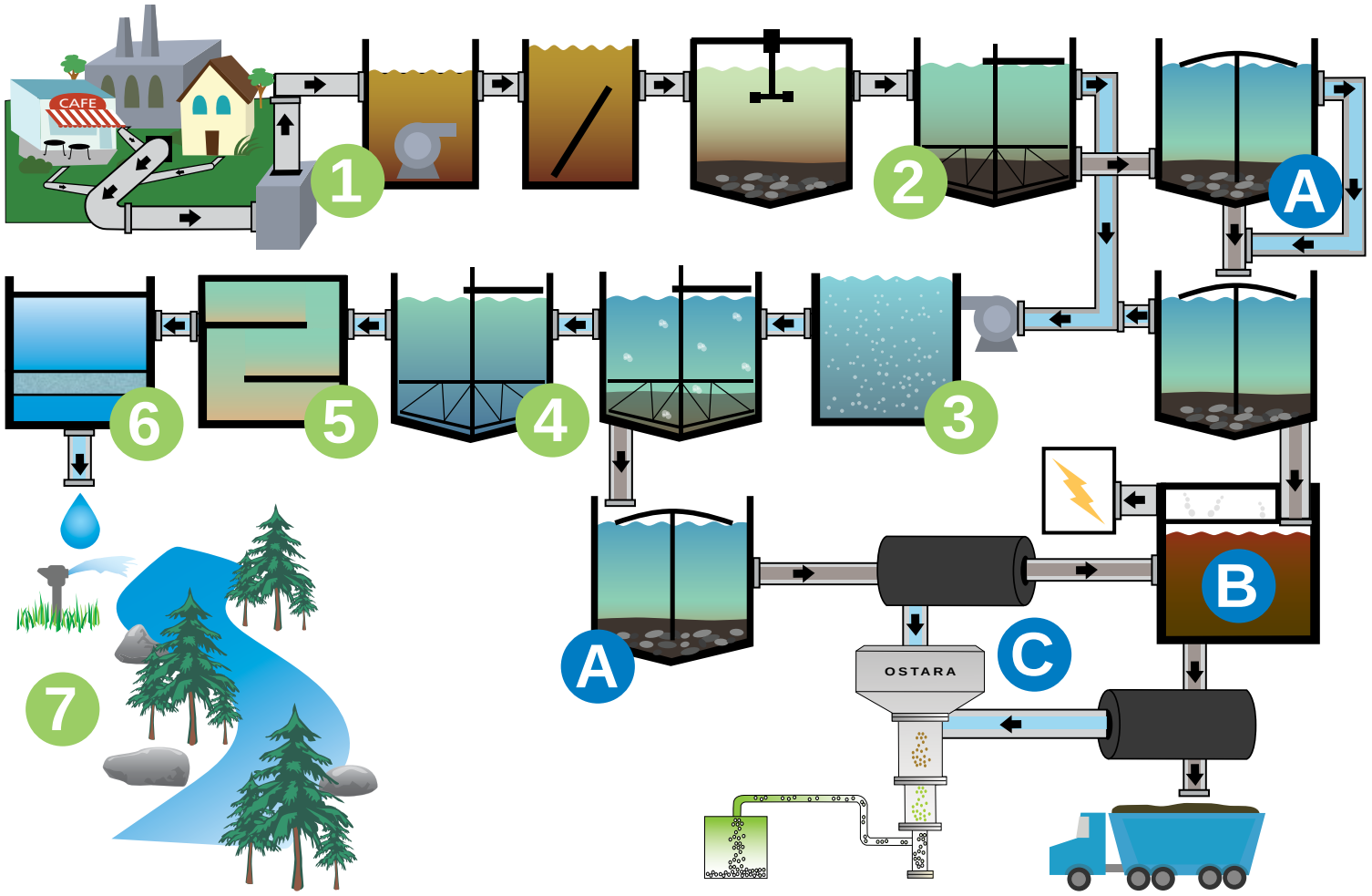
Cleaned water is also used for local irrigation, and natural byproducts of the treatment process are converted to electricity, heat and used as soil amendments. Captured methane gas, a byproduct of anaerobic digestion, supplies electrical power for the facility. In 2009, Durham installed the first commercial nutrient recovery facility in the nation in partnership with Ostara Nutrient Recovery Technologies in Canada. The facility captures 80% of the phosphorus from the wastewater recycle stream and converts it into a premium, slow-release fertilizer used in agriculture and nurseries.

The Durham facility began operations in 1976 to reverse decades of severe water pollution in the Tualatin River and its tributaries, and to meet the demands of a growing population. This facility centralized a scattered system of inefficient wastewater treatment plants, creating one of the most efficient and advanced facilities in the world.

Durham Facts

- Provides a higher level of treatment than 98% of facilities in the nation
- Meets over 1,000 permit conditions, including monthly, weekly and daily limits established to protect the Tualatin River
- Operates 24-hours a day, 365 days a year
- Serves a growing population of approximately 250,000
- Cleans an average of 22 million gallons of wastewater per day
- Recycles more than 50 million gallons a year of reclaimed water for local irrigation
- Recycles more than 12 dry tons of biosolids daily for use as a soil amendment
- Produces approximately 400 tons of Crystal Green®, a commercial, high-value fertilizer
- Meets 60% of facility electrical needs through the self-generation of energy
- 2007 – U.S. EPA National Clean Water Act Recognition Award for the best operated and maintained large, advanced treatment facility in the nation
- National Association of Clean Water Agencies (NACWA) Gold Award for 100% permit compliance achieved over multiple years

DURHAM WATER RESOURCE RECOVERY — PROCESS



Liquids Recovery

At the Durham Water Resource Recovery Facility, used water flows through the plant through a series of processes: preliminary, primary, secondary, tertiary, disinfection and effluent discharge.

1 Preliminary Process

Flow from homes and industry eventually comes to the Durham Influent Pump Station. The flow is measured and then pumped to the Headworks Building. Headworks prepares the incoming flow for downstream treatment by screening out larger debris and garbage and allowing heavy materials to drop out prior to Primary Treatment.

2 Primary Treatment

Flow from Headworks is sent to up to four separate primary clarifiers. Primary clarifiers are large tanks that allow the flow to slow down. This lets particles settle to the bottom of the tank while fats, oils, and grease float to the surface. A skimming arm skims the water surface to remove buildup while sludge pumps remove sludge from the bottom of the clarifiers. The solids removed from these tanks are sent to solids handling for further treatment.

3 Secondary Treatment

There are many types of secondary treatment. The Durham facility employs activated sludge with an enhanced biological nutrient removal configuration. This means an environment is created in aeration basins that allows the natural bacteria in wastewater to grow and thrive. The bacteria incorporates contaminants and phosphorus in the

Solids Recovery

The first half of the job at a water resource recovery facility is to remove foreign constituents from the liquid flow stream. Those foreign constituents, or solids, are resources that can be reclaimed. The solids treatment process consists of thickening, digestion, dewatering, and phosphorus recovery.

A Thickening

The main purpose of thickening is to concentrate the solids by removing a large volume of water. We are able do this by gravity thickening the primary sludge. The UFAT® process was created at Durham to capture the volatile fatty acids in the primary sludge and returns those acids to the aeration basin to aid in nutrient removal.

The secondary sludge goes through a process invented by CWS called

DURHAM WATER RESOURCE RECOVERY — PROCESS

water. The bacteria can also convert the nitrogen in the water into nitrogen gas. As the flow leaves the aeration basin, secondary clarifiers slow the water down similar to primary clarifiers. As the bacteria sink to the bottom, sludge pumps return the bacteria to the front to meet the incoming flow and remove further contaminants. A portion of the bacteria are removed (wasted), along with contaminants and nutrients in the bacteria, and sent to solids handling to maintain a stable aeration basin population.

4 Tertiary Treatment – Chemical Clarification

At Durham, tertiary treatment is accomplished by chemical clarification. Alum is added to the secondary effluent to allow smaller particles to clump together and form a "floc" of particles. These larger clumps are easier to settle in the chemical clarifiers, where they are removed and sent to solids handling.

5 Tertiary Treatment - Filtration

The filters contain a mixture of sand and anthracite media to capture fine particles that were unable to settle out in the primary and secondary treatment processes. This is the same process that occurs at drinking water plants for purifying the water and is a final step to reduce phosphorus concentrations to extremely low levels.

6 Disinfection

Disinfection inactivates harmful microorganisms and Durham accomplishes this with chlorine. The flow is dosed with sodium hypochlorite, a more concentrated form of bleach, and held in serpentine tanks called chlorine contact basins to allow sufficient contact time to disinfect the flow. As the flow leaves the chlorine contact basins, it passes through filters.

7 Effluent Discharge

As the flow prepares to leave the plant, sodium bisulfite is added to neutralize any remaining chlorine in the water. The resulting water is such high quality, it actually improves the health of the river and is close to drinking water quality. In the summer, a portion of the water is not returned to the river, but is instead used onsite or pumped offsite as Class A recycled water for irrigation. The recycled water is not dechlorinated so that the chlorine can prevent a recurrence of contamination.

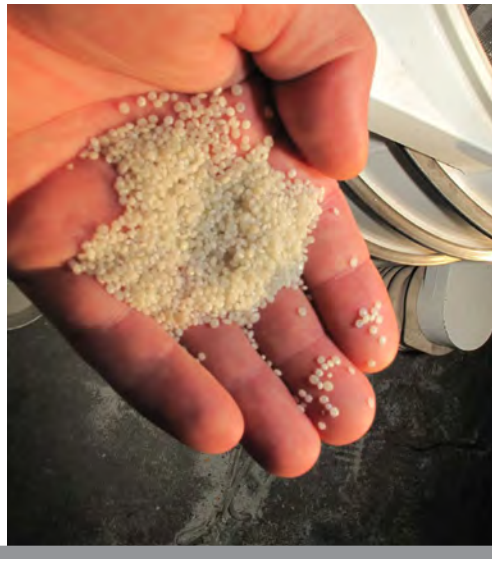
WASSTRIP®. It goes through a process of gravity thickening in an environment without oxygen, which causes the bacteria to release stored phosphorus. Then, the secondary sludge is further thickened using a centrifuge. The liquid from the centrifuge is high in phosphorus, so it is sent to phosphorus recovery to reclaim the phosphorus. Sludge from the primary and secondary processes is mixed together and sent to the anaerobic digesters.

B Digestion

Anaerobic digesters function much like a human stomach. They consume what they're fed and turn that "food" into water and biogas, which is high in methane. The biogas is captured and fed to engine generators, which produce electricity used to help run the plant. They also provide heat to keep the digesters at a healthy temperature and space heating for much of the Durham campus. During the digestion process the solids are stabilized to meet Class B biosolids criteria. Any solids left are sent to dewatering.

C Dewatering and Phosphorus Recovery

Water in the sludge from the anaerobic digesters is removed using high-speed dewatering centrifuges. This liquid has a high content of phosphorus and ammonia, so it's sent the phosphorus recovery center to make a high quality fertilizer.



DURHAM WATER RESOURCE RECOVERY — COGENERATION

Cogeneration

In 2016, Clean Water Services (CWS), Energy Trust of Oregon and the Oregon Department of Energy dedicated a new cogeneration system that converts wastewater and food grease into clean, renewable energy. With this innovative system, the Durham Treatment Facility is the third water resource recovery plant in Oregon to co-digest fats, oils and grease.

The new system triples Durham's renewable energy generation, producing 60 percent of the electricity needed to run the water resource recovery facility when coupled with its existing 403-kilowatt solar electric system. Renewable electricity and heat produced will be used onsite, reducing CWS's energy costs by nearly $800,000 annually, ensuring value for ratepayers. Generating clean, renewable energy from biogas reduces greenhouse gas emissions and helps Oregon meet its carbon reduction goals.

Since 1993, Durham has operated a 500-kilowatt cogeneration system using biogas from treatment of the communities' wastewater to offset its own energy usage. By replacing this smaller engine with two new engines, Durham now has a 1.7 megawatt cogeneration system fueled by biogas produced from the anaerobic digestion of municipal wastewater solids as well as fats, oils and grease (FOG) collected from Washington County restaurants and others. FOG, also known as "brown grease," is pumped out of restaurant grease traps and interceptors at regular intervals.

This is just the latest project where Clean Water Services and Energy Trust have teamed up to invest in projects that save and generate energy. Since 2004, Clean Water Services has worked with Energy Trust on more than 100 energy-saving improvements throughout its facilities – everything from large-scale capital improvements to new energy-efficient lighting, pumps and drives and operations and maintenance improvements. This has resulted in more than 9 million kilowatthours of electricity saved per year for Clean Water Services, and lower utility bills and operating costs translates to saving for their ratepayers.

Revised 8/20

Size and scope

- 1.7-megawatt cogeneration system: two Jenbacher 848-kilowatt cogeneration reciprocating engines fueled by biogas, not fossil fuel
- Annual expected generation: ~12,300 megawatt-hours per year
- Combined with the 403-kilowatt solar electric system, expected generation is more than 12,800 megawatt-hours per year – enough electricity to power 1,100 homes for a year and will help avoid producing 6,000 tons of carbon dioxide
- Average gallons of fats, oils and grease (FOG) co-digested per week: 70,000, moving up to 100,000 gallons with next six months
- Cost: $16.8 million
- Energy Trust of Oregon incentive: $3 million
- Oregon Department of Energy Tax Credit for combined heat and power: $2.8 million

Benefits

- Cuts Clean Water Services operating costs saving money for ratepayers
- $690,000 first year annual estimated savings in electrical costs.
- $100,000 first year annual estimated savings in heating costs.
- Generates $340,000 annually in tipping fees for FOG disposal
- Keeps fats, oils and greases out of pipes and treatment plant, saving operating costs and preventing sewer backups
- Reduces the level of greenhouse gases released into the environment
- Recovers waste that would be otherwise be disposed of or landfilled
- Advances sustainability goals for Oregon

Clean Water Services
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Hillsboro, Oregon 97123
503.681.5100
cleanwaterservices.org

East Basin Master Plan

IDENTIFYING THE CONVEYANCE AND TREATMENT INFRASTRUCTURE NEEDS OF THE NEXT 20 YEARS

- **Nate Cullen,** Chief Operating Officer
- **Rick Shanley,** Treatment Plant Services Manager
- **Kathy Leader,** Chief Financial Officer
- **Joe Gall,** Chief Utility Relations Officer
- **Mark Jockers,** Chief of Staff

Master Plans are used to manage assets and plan for growth and development. 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 helps 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.

CWS staff is recommending that the Board charge the Clean Water Services Advisory Commission with reviewing the East Basin Master Plan and making a recommendation on adoption. Concurrently, staff will be working with our partner cities within the East Basin area to gather input on the plan's assumptions, approach and findings.

East Basin Master Plan

JUNE 2021

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Clean Water Services

Introduction

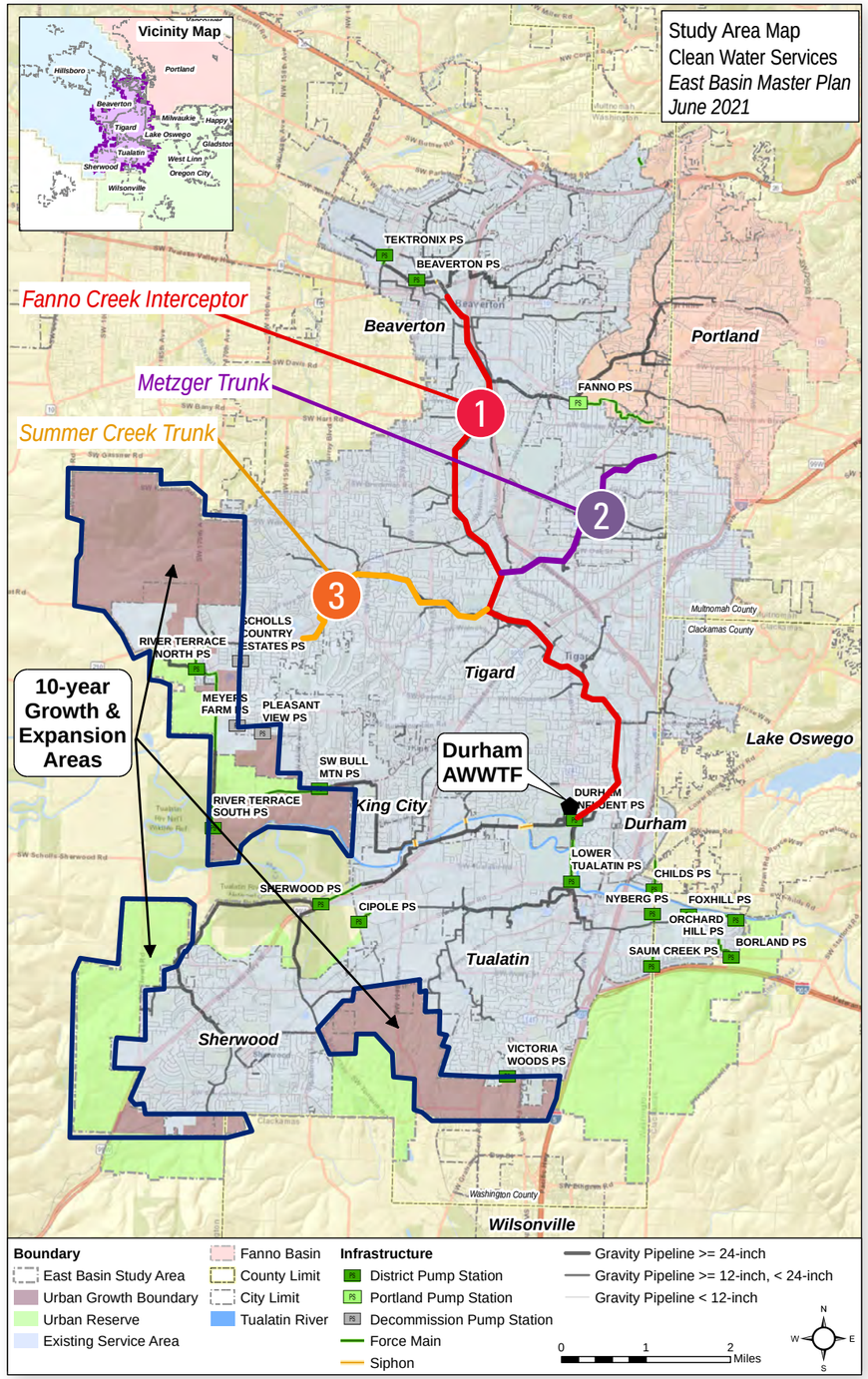
The mission of Clean Water Services (the District) is to safeguard the Tualatin River's health and vitality, ensure the economic success of our region, and protect public health for over 600,000 residents and businesses in urban Washington County. The District's past planning efforts have protected the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

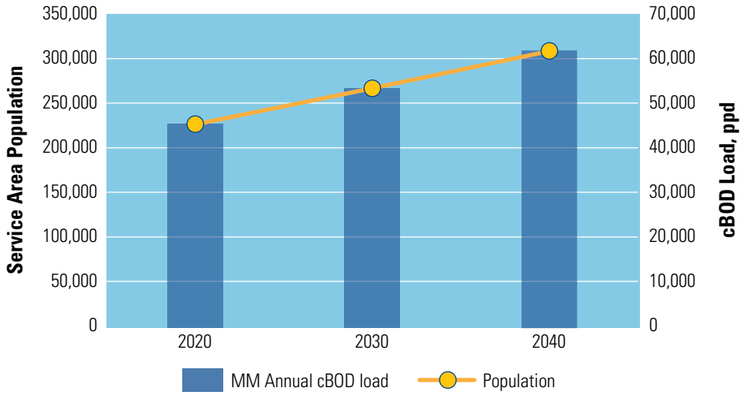


Updated Basis of Planning

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.

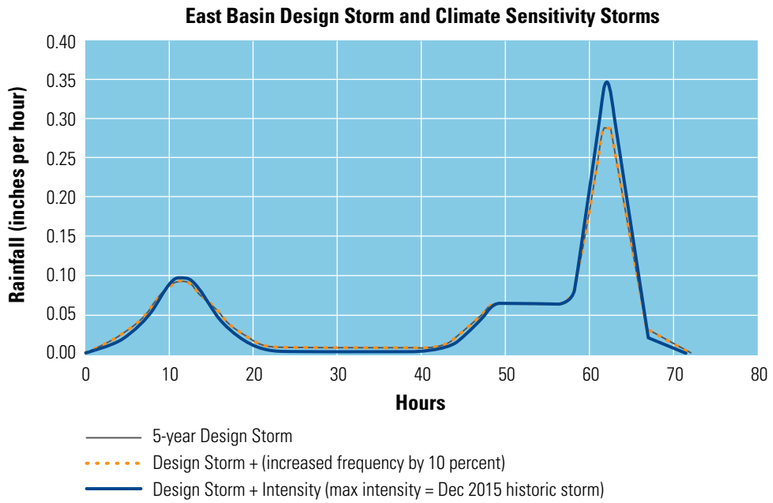
- **Phosphorous.** Water quality modeling suggests that the Tualatin River is no longer as sensitive to phosphorus inputs as it once was. The District is working with Oregon Department of Environmental Quality (DEQ) to support an update of the phosphorus TMDL. Based on this uncertainty, two effluent 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

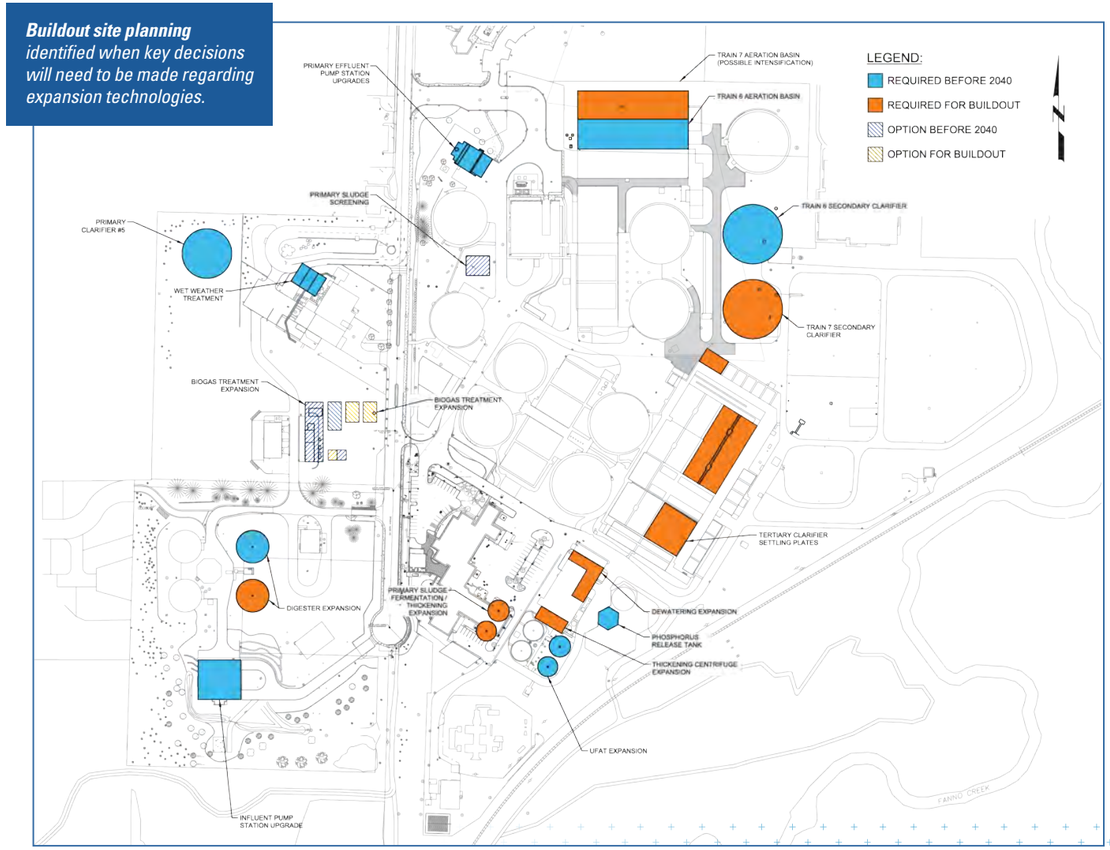
This section highlights the following outcomes and features of this Plan that will guide the District in making key decisions and optimizing facilities:

- ✓ 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.

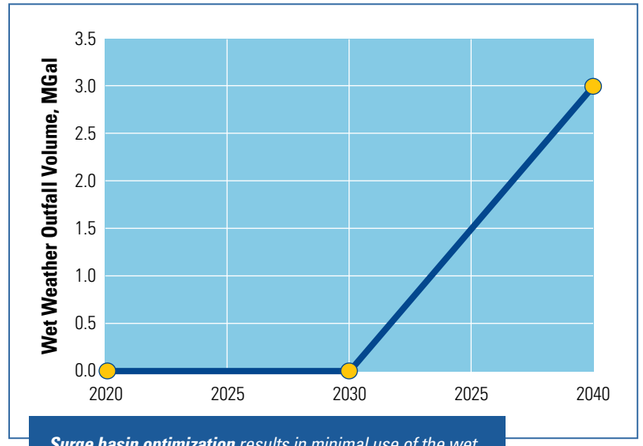
***Buildout site planning** identified when key decisions will need to be made regarding expansion technologies.*



Operations Optimization at Durham AWWTF

Surge Basin Optimization

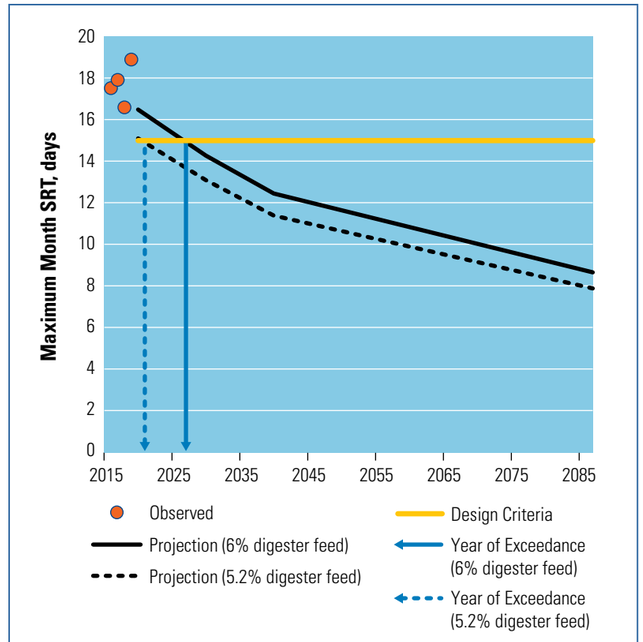
The District identified an opportunity to maximize plant capacity and improve effluent quality by reconfiguring their two surge basins, which equalize peak flows. By dedicating the large surge basin for primary effluent flow and the small surge basin for secondary effluent, the surge basin return flow 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.

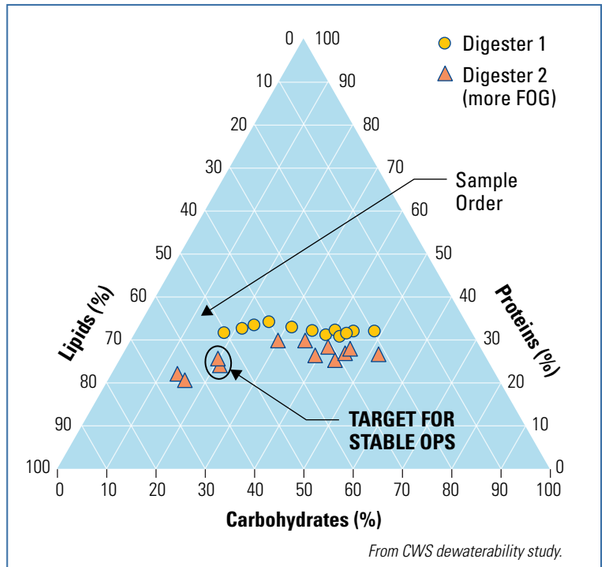


***Planning for a thicker** digester feed allows the anaerobic digestion project to be pushed out 6 years to the year 2027.*

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.

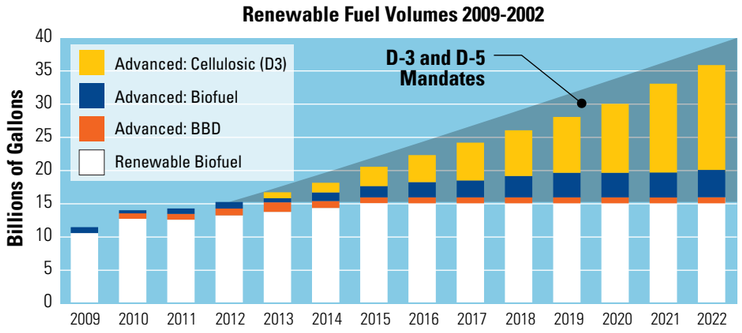


From CWS dewaterability study.

***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.*

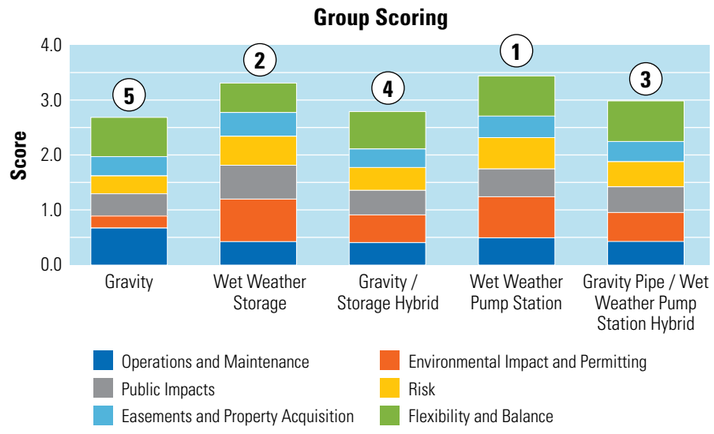
gas can provide not only environmental benefits, but a financial benefit to the District as well. The Plan documented the additional gas conditioning steps that would be required to produce pipeline quality gas and allocated site space for these future processes to facilitate potential future implementation.

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.

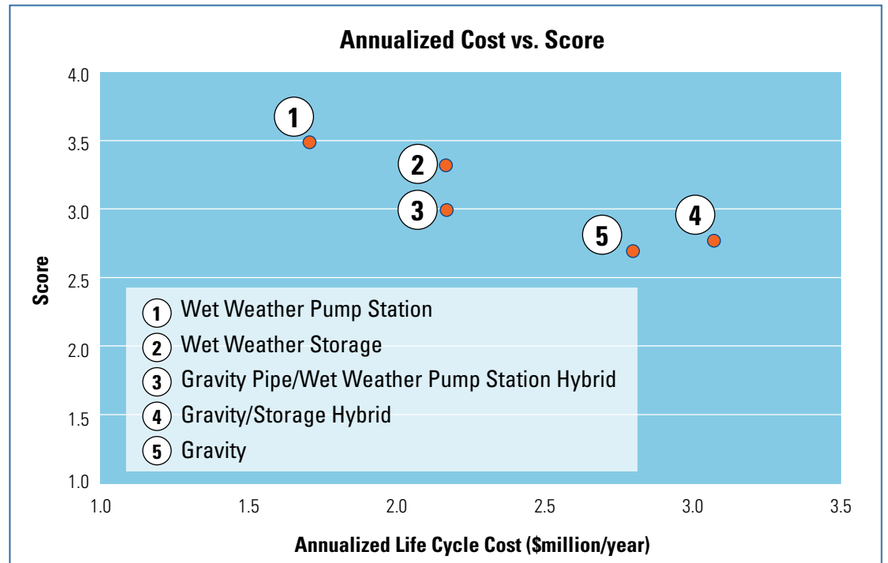
An example output from the scoring process is shown in this graphic. The alternatives were ranked based on score with a higher score representing a preferential alternative.



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.*

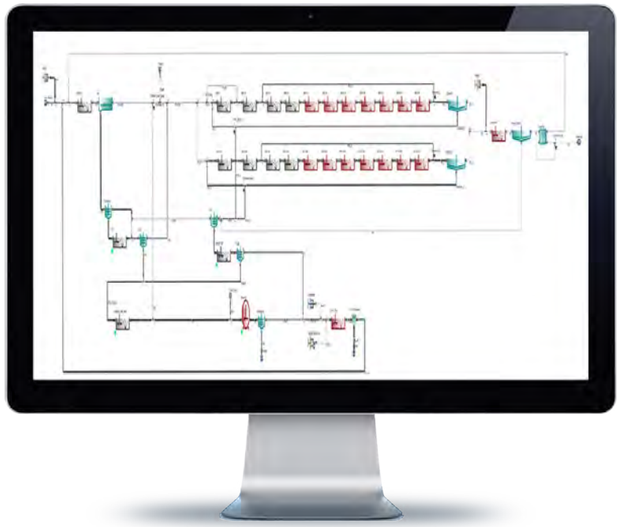
Ultimately, conveyance capital improvements were selected that emphasized the following:

- 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).

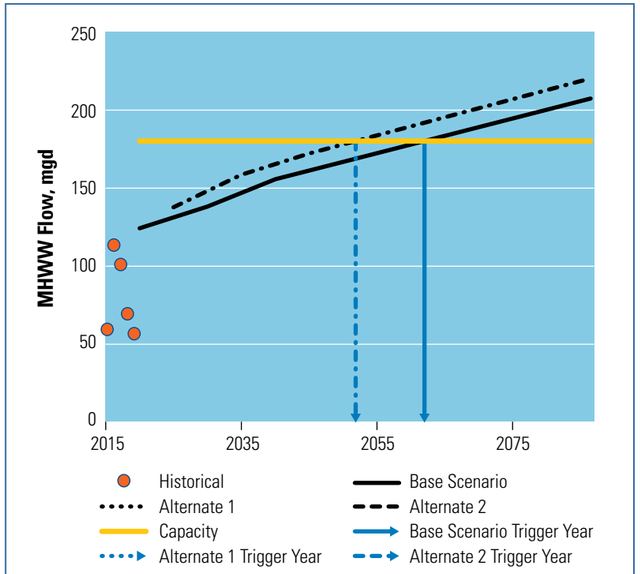
"Living" Plan

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.

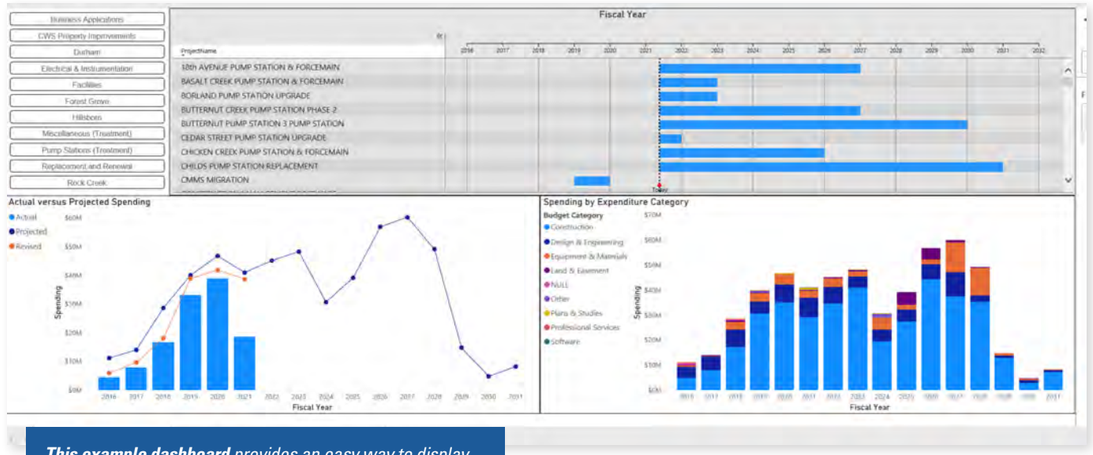


***The District will** use the calibrated Sumo model of the Durham AWWTF to evaluate solids balance impacts based on alternate growth scenarios.*



***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*

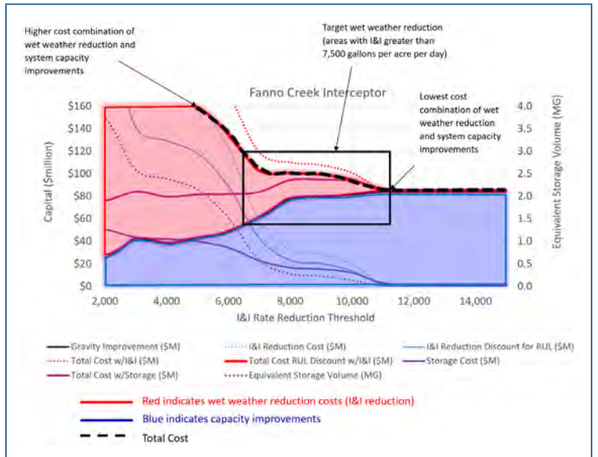
- Full length of Fanno Creek corridor (~8 miles).
- Trenchless rehabilitation to minimize impact to creek corridor.
- Reduces risk of pipeline structural failure and groundwater intrusion.

3 *Metzger Trunk Pipeline Upsizing*

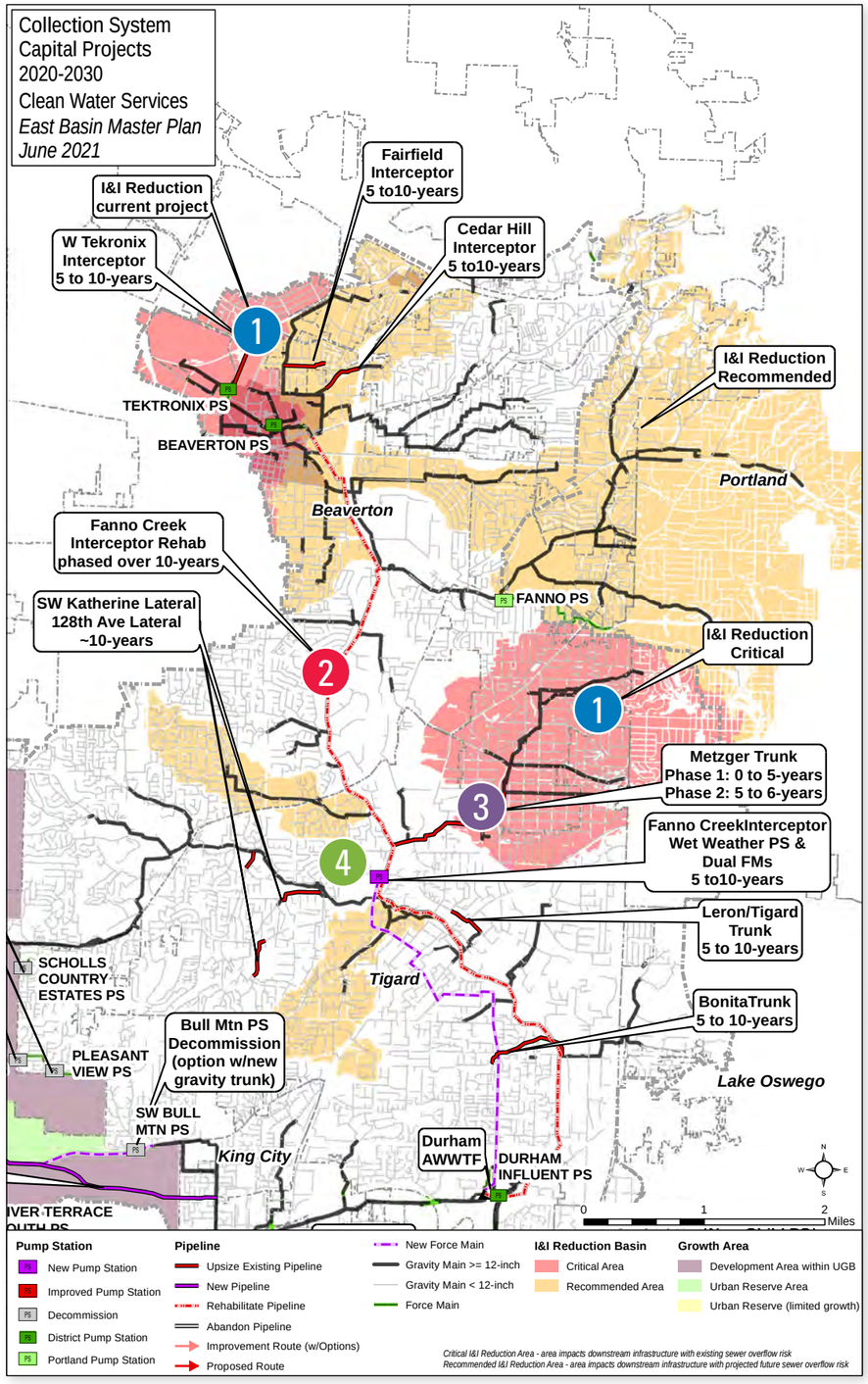
- Capacity improvement to reduce risk of sewer overflows.
- Paired with wet weather flow reduction targets.
- Opportunity to consider partnering opportunities for adjacent land access for environmental enhancement.
- Trenchless construction under Metro transit line.

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.



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



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.

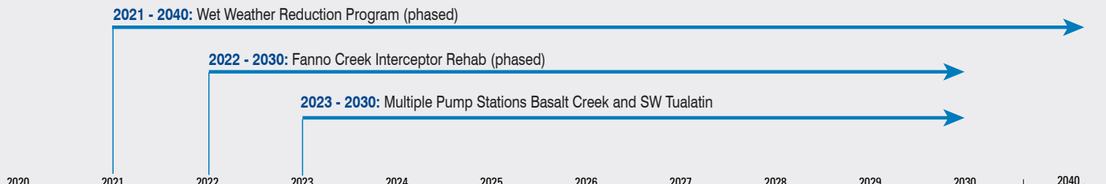
2 *Sherwood*

- 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
Rock Creek Trunk (phase 1, Sherwood)

2023: Martinazzi Trunk (phase 1, Tualatin)
Norwood Pump Station

2024: Rock Creek Trunk (phase 2, Sherwood)

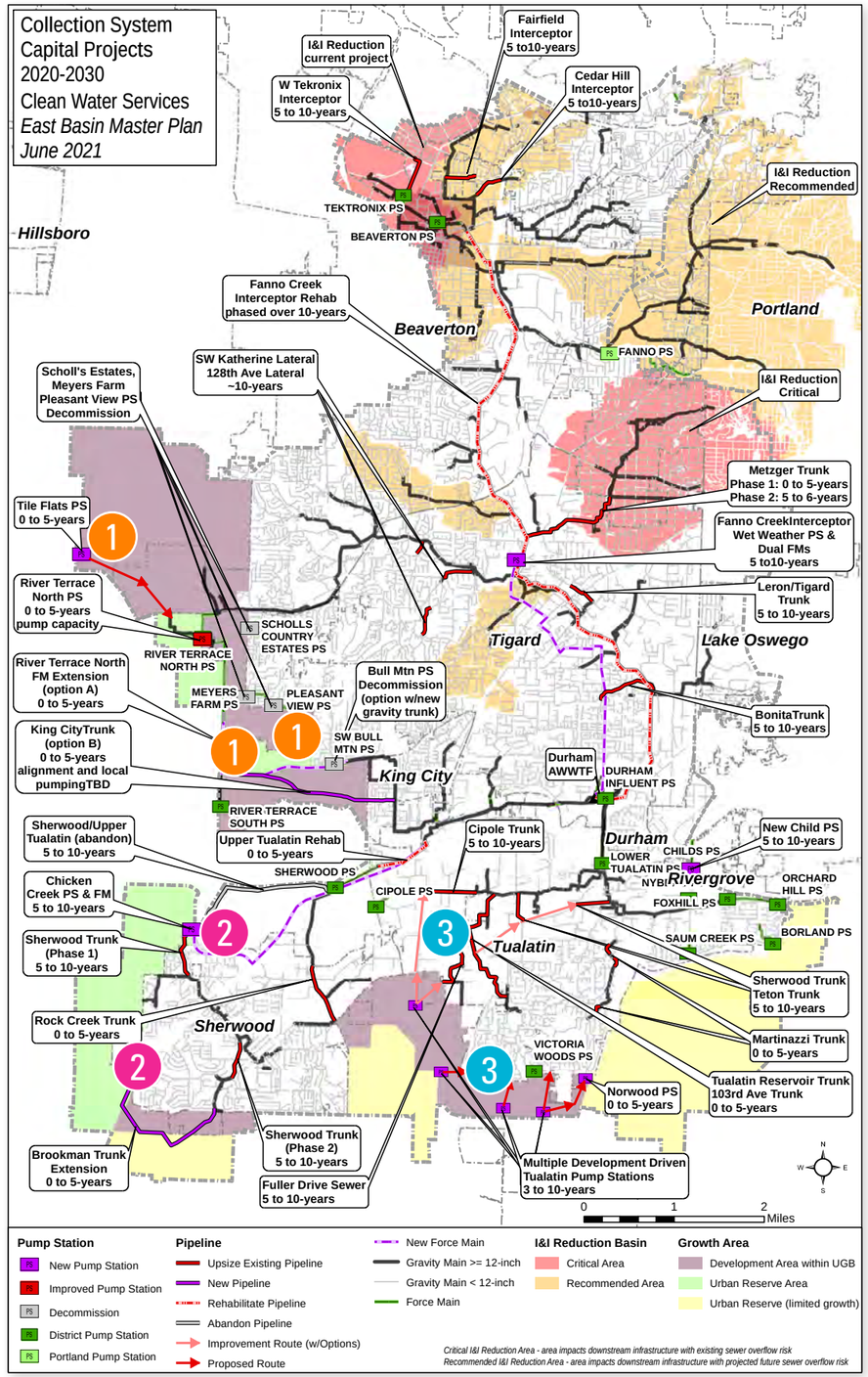
2025: Metzger Trunk (phase 1)
King City Trunk or River Terrace North FM
Brookman Trunk (Sherwood)
Tile Flats Pump Station
Martinazzi Trunk (phase 2, Tualatin)
103rd Ave Trunk (Tualatin)
Tualatin Reservoir Trunk (Tualatin)
River Terrace North Pump Upgrades
Decommission Meyers Farm, Scholl's County Estates, Pleasant View Pump Stations

2027: Metzger Trunk (phase 2)

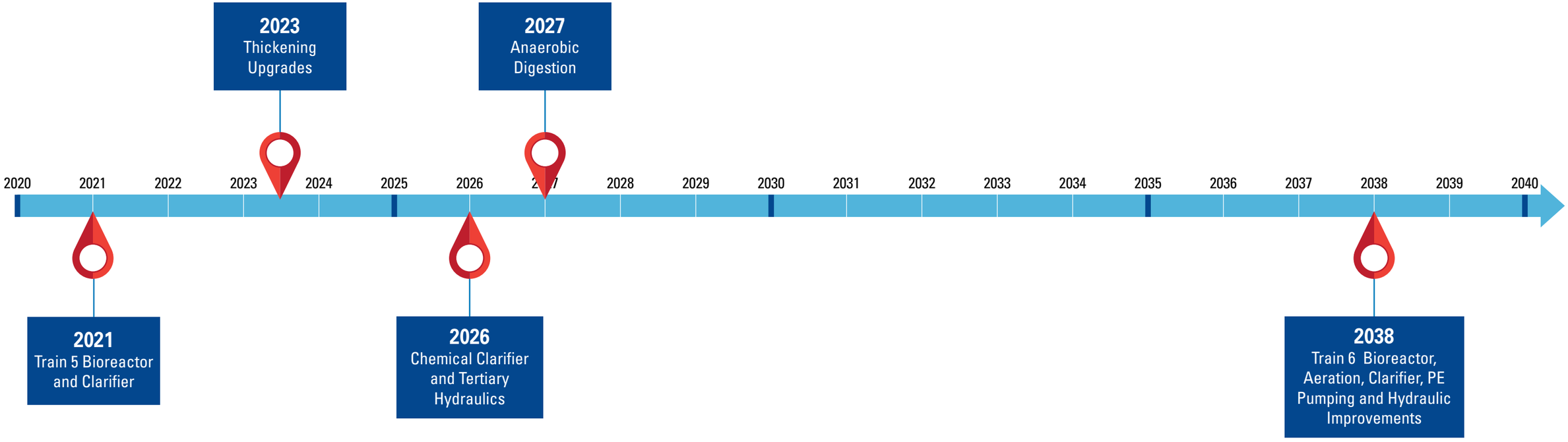
2028: Chicken Creek Pump Station and Force Main

2030: Fanno Interceptor Wet Weather Pump Station and Force Mains

2026-2030:
West Tektronix Interceptor (Beaverton)
Bonita Trunk (Beaverton)
Leron/Tigard Trunk (Beaverton)
Cedar Hill Interceptor (Beaverton)
Fairfield Interceptor (Beaverton)
Fuller Drive Sewer (Tualatin)
Teton Trunk (Tualatin)
Sherwood Trunk (Sherwood)
Sherwood Trunk (Tualatin)
Cipole Trunk (Tualatin)
128th Ave Lateral (Tigard)
SW Katerhine Lateral (Tigard)
New Child Pump Station



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.

DAY 2

Wednesday, October 20, 9 a.m. to 1 p.m.
Durham Water Resource Recovery Facility Conference Center

Learning Themes and Objectives

- Organizational Excellence: Performance Excellence Program and Charting a Path to the Future
- Connecting With the Community: Stakeholder Research Report
- Tualatin Project/Scoggins Dam Update

9 a.m.	**Welcome, introductions, overview of learning**
9:15 a.m.	Performance Excellence Program • Draft Organizational Profile • Draft Workforce Profile • Roadmap development
9:50 a.m.	Great Oregon ShakeOut
10:45 a.m.	Understanding what the public expects of CWS • 2021 Stakeholder Research Report, Lara Media Services
12 p.m.	Working lunch: Tualatin Project/Scoggins Dam update
1 p.m.	Adjourn

Performance Excellence Program

- **Diane Taniguchi-Dennis,** Chief Executive Officer
- **Ryan Locicero,** Business Practice Leader 1 Strategy, Performance and Innovation

The Baldrige Excellence Framework and its criteria for Performance Excellence incorporate proven practices on current leadership and management issues into a set of questions that help organizations meet current challenges, leverage strengths and manage all components of an organization as a unified whole to achieve its mission, ongoing success and performance excellence.

Performance Excellence asks us to look at how we do things. It emphasizes business process management and provides a framework for assessing process maturity. This process maturity continuum gives us a common language to understand where we are and where we want to go for a given process or service.

The Framework is updated every two years, and today's organizations' critical issues are woven throughout the category sections. The 2021-22 Framework critical issues or challenge areas are innovation; resilience; the digital economy and the fourth industrial revolution; cybersecurity; societal responsibility and global sustainability; and diversity, equity and inclusion.

CWS has advanced in three areas of the Performance Excellence Framework: 1. Organizational Profile, 2. Workforce Category and 3. Strategy Category.

1. The Organizational Profile was refreshed in November 2020 and presented to the CWS strategic advisory group in January 2021. The responses to questions were then presented to the Business Partners for learning, comments and feedback. Our executive leadership team has since reviewed and is developing action plans for areas where there is conflicting information or minor discrepancies.
2. Human Resources was one of the first groups that started answering the Performance Excellence Workforce criteria questions. They began in January 2019 and Holly Dober and Tiffany Vance picked up the work earlier this year and

documented the current state of the District in responding to all 14 Workforce category questions.

3. Our Strategic Approach describes the system and philosophy that guide the work of the people of CWS as we contribute with a common purpose toward five key strategic outcomes.
    - Our strategy development and implementation approach is to create our roadmaps, develop metrics and align our roadmaps and metrics with our Goal Sharing program.
    - Our roadmap toolbox has two key resources. The first, our Roadmap Workbook, is a comprehensive resource and methodology for strategic and aspirational planning. The second is Roadmap Lite. This approach is referred to as a strategic plan on a page or a one-page strategy. This one-page strategic communications tool aligns programs with our key strategic outcomes, integrates with our future strategic plan document, and includes a performance excellence mechanism for assessing process maturity. (Our Performance Excellence Roadmap Lite is provided as a reference and example of this key strategic planning resource.)

Training for our senior leaders includes national programs such as the Baldrige Quest for Excellence conference, Executive Fellows Program and examiner training. The regional program, Performance Excellence Northwest (PENW), has similar offerings at the regional level. This year, our Chief Strategy Officer and Chief Regional Utilities Officer will participate in the PENW Executive Collaborative program.

Roadmap Lite

Organizational Excellence

FY21-22

Performance Excellence Journey

The Baldrige Excellence Framework and its Criteria for Performance Excellence incorporate proven practices on current leadership and management issues into a set of questions that help you rise to challenges, leverage strengths, and manage all the components of your organization as a unified whole to achieve your mission, ongoing success, and performance excellence.

Status:
- Aspirational
- Strategic
- Foundational

Lead:
- Office of the CEO

Measures

Senior Leadership Training Participation = ft(x)

Category Section PES = fp(x)

Pathways Program PES = fp(x)

Assessment PES = fp(x)

Formulas

ft(x) = No. Senior Leaders Participating in Training / Total No. Senior Leaders

fp(x) = Aggregate Milestones Percent Complete / Total Available Percent Complete

Initiatives	Deployment & Integration
Senior Leadership Training (Regional)	Enroll senior leaders in regional training including, PENW Executive Collaborative, PENW Learning Symposium, and PENW Examiner Training.
Senior Leadership Training (National)	Enroll senior leaders in national training including, Baldrige National Quest for Excellence Conference, Baldrige Executive Fellows Program, and Baldrige Examiner Training.
Complete the Organizational Profile	ELT answer and review questions. Use topics in which there is conflicting, little, or not information for action planning.
Complete the Workforce Category	Establish a team and respond to the category questions. ELT review and use topics in which there is conflicting, little, or not information for action planning.
Category Section Training	Advanced curriculum and materials via Passport and Clean Water Learning Online.
PENW Pathways Program	PENW facilitated discussion on organizational profile and category sections. Develop Lite application for Categories 1-4, and 6.
Category Section Assessment	Competitive Edge and PENW assessment & feedback report.

Terms & Abbreviations

PES	Project Evaluation Score
ELT	Executive Leadership Team
PENW	Performance Excellence Northwest
LUOW	Leading Utility of the World
UoTF	Utility of the Future Today

Purpose

Goal: To be the best

Advantage: Recognized LUOW & UoTF, PENW Board of Directors and COE National Examiner on Staff.

Scope: CWS Senior Leaders

What

- Business Process Management
- Systems Perspective
- Integration of Business Processes
- Continuous Learning and Improvement
- Results

CWS Values

- Efficient Decision Making
- Visionary Leadership
- Performance Management

P. Organizational Profile

P.1 Organizational Description

Clean Water Services is a regional County Service District formed under Oregon Revised Statue (ORS) 451 that provides wastewater & stormwater services with a watershed restoration approach to enhance the water resources management of the Tualatin River Watershed. The organization is internationally recognized for its dedication to innovation and results and locally appreciated for its major contributions to making the region a great place to live, work, invest and recreate. Four hundred employees strong, its service area is located almost entirely in Washington County, just west of Portland. Washington County is home to major industries such as Nike and Intel, as well as small businesses, vineyards and forests. The population, the state's most racially diverse, has passed the 600,000 mark and is growing fast. Rates, not taxes, are the primary revenue source for Clean Water Services. The CWS Board of Directors is composed of the five people elected as Washington County Commissioners. Although CWS maintains a close working relationship with Washington County government, CWS is separately managed and financed.

P.1 a Organizational Environment

P.1 a (1) Product Offerings

Clean Water Services protects public health and the environment by managing water as it moves through the built and natural environment. The organization's product offerings and services can be summarized as follows:

- Clean Water (streamflow, irrigation)
- Nutrients (struvite, biosolids)
- Energy
- Floodplain Connection & Restoration
- Access to Nature and Human Health (Service, Virus, Nature Rx)
- Community Stewardship
- Outreach & Engagement
- Healthy Soils
- Clean Air

Clean Water Services delivers most of these product offerings, which are of equal importance, directly to households, businesses and other institutions. It builds, maintains and improves the complex and sophisticated network of gray and green infrastructure – from pump stations and digesters, to storm drains and pipes, to engineered wetlands and restored natural systems – that make it possible to deliver these product offerings.

CWS has also made agreements with partners (county and city government as well as private developers) to deliver services that meet certain criteria. For example, sanitary sewer pipes under 24 inches in diameter are generally the responsibility of the County and partner cities. Similarly, some education services are delivered by community-based organizations under grant agreements. In these cases, CWS retains responsibility to successfully deliver the product offerings because it holds the federal permit that covers all stormwater and wastewater management for the urbanized portions of the region. CWS works in close partnership with drinking water providers and other key participants in our region's water supply strategy.

Product offerings and delivery mechanisms are driven by the CWS Strategic Approach and five Key Strategic Outcomes.

P.1 a (2) Mission, Vision, Values and Culture

CWS business is clean water. Health and safety have been our priority for over 50 years. In 1970, CWS became one of the nation's first sewer utilities. In 1990 our mission expanded to include Stormwater and watershed health. And 15 years ago, we redefined our mission, vision and values to support find creative solutions to meet the needs of our community, economy, and watershed health.

CWS sustains and deepens a resilient culture of innovation, learning, self-leadership, inclusion, kindness, deep collaboration and dedication to public service. Through adoption of the Performance Excellence framework and other strategic initiatives, CWS is putting structure, processes and systems in place that strengthen the culture and drive progress toward the mission, vision, values and promise.

The Key Strategic Outcomes are central to fulfilling the mission, vision, values and promise and are therefore recognized as the organization's core competencies.

Our Mission, Our Vision, Our Promise, Our Values

Our MISSION

We provide cost-effective services and environmentally sensitive management of water resources for the Tualatin River Watershed.

Our VISION

Enhance the environment and quality of life in the Tualatin River Watershed through visionary and collaborative management of water resources in partnership with others.

Our PROMISE

Beautiful clean water for today and tomorrow.

Our VALUES

- **A Long-Range, Comprehensive, Basin-Wide Perspective** on water resources issues, challenges and opportunities.
- **A Supportive, Collaborative, Team-Based Work Environment** utilizing timely communication and diverse backgrounds, skills and aspirations of all Clean Water Services employees.
- **Active Public Awareness and Involvement** in Clean Water Services affairs and regional water resources issues.
- **Decision-Making and Performance Management** based on up-to-date, scientific and technical information.
- **Financially Sound, Fiscally Responsible Management** maximizing value for Clean Water Services ratepayers and investors.
- **Our Employee Team** as Clean Water Services' greatest and most trusted resource and asset.
- **Protection of the Public Health and Enhancement of the Environment** through the development and delivery of Clean Water Services programs and services.
- **Quality, Cost-Effective Customer Service** supported by friendly, service-oriented personnel.
- **Strong, Visionary and Principle-Based Leadership** providing direction and purpose in the achievement of the Clean Water Services mission.
- **Technical Excellence and Innovation** in the management of Clean Water Services' water resource facilities.
- **Timely, Efficient Decision-Making at the Appropriate Level of the Organization** enabling Clean Water Services to act swiftly, responsibly and effectively.

Organizational Excellence: CWS is a highly effective and transformative organization that maximizes the capabilities, talent and effectiveness of our employees to provide services and products that deliver on the values of the region we serve.

Integrated Water Resource Management & Resilient Watershed: In partnership with others, CWS creates resilient watersheds by optimizing and integrating the management of water resources for the benefit of the public and the environment.

Research, Innovation & Resource Recovery: CWS provides services and products that deliver practical and pragmatic water solutions for our region to recover resources and to optimize our operations through innovation that is shared globally.

Catalyzing Transformational Partnerships: CWS goes beyond organizational boundaries to create and sustain strategic partnerships in the region to accomplish more than any one organization can alone.

Contributing to the Region's Environmental & Economic Vitality: CWS' sound planning, investment and stewardship in regional assets is essential to the region's Washington County's continued appeal as a place to invest, live, work and play.

P.1 a (3) Workforce Profile

Figures represent full time equivalent for positions filled as of April 7, 2021. Regular" excludes temps and interns.

399	All Regular-FTE
214	NonRepresented-FTE
185	Represented-FTE
31	NonExempt-FTE
80	Exempt-FTE

30%	Female
70%	Male

49%	0-5 years
28%	6-15 years
15%	16-25 years
8%	26+ years

4%	Asian
0.25%	Black or African American
1%	American Indian or Alaskan Native
4.75%	Hispanic or Latino of any race
1%	Native Hawaiian or Other Pacific
2%	Two or More races
87%	White

This table tells the story of the breadth of the Clean Water Services workforce, drawn from local and national talent pools. All positions at Clean Water Services require specialized skills and training, as well as education and professional certifications. The scope of positions include fields such as chemistry, biology, water and environment technology, engineering and business administration and services.

Drivers of employee engagement include development and growth opportunities, two-way communication, supportive work environment, pride in contributing to the community, and total compensation. The current understanding of these drivers is anecdotal; the organization is moving toward a more data-driven approach.

The District's workforce is about half (46%) represented employees. These employees are represented by Teamsters Local 223, and primarily reside in the technical positions of Water Resource and Recovery, Field Operations, Utility Operations, and Watershed, along with several accounting positions as well. Due to the nature of our industry, a majority of the workforce is subject to specialized safety requirements. These requirements are in areas such as handling chemicals, operating heavy machinery, working in confined spaces and lock out tag out procedures.

In order to attract and retain employees, the District offers a robust benefits and retirement package. Benefits include medical, dental and vision, along with wellness incentives and contributions to the Healthcare Reimbursement Account (HRA). These incentives revolve around healthy habits identified in the employee wellness program, which is open to all staff.

P.1 a (4) Assets

Clean Water Services' major assets include:

Facilities
43 pump stations
Administration Building Complex
Durham Water Resource Recovery Facility
Fernhill
Field Operations facility
Forest Grove WRRF
Hillsboro WRRF
Material Handling Yard
ripl: Research, Innovation, Partners, Labs facility
Laboratories
Rock Creek WRRF
Tualatin River Farm
Stormwater (green infrastructure)
Distributed Infrastructure (Danny to Hall)

Equipment
350 MGD capacity water resource recovery system, encompassing
miles of CWS-owned sani and storm conveyance
summary of fleet: B10s, recycler, trucks, cars, etc.
solar arrays
servers, MFD Multi-functioning Devices (copiers)
lab equipment
FO Equipment, Construction & Maintenance Equipment

Technologies
Wastewater Treatment
Phosphorous removal
Cogeneration
Open Customer Information System (Utility Billing)
ORACLE ESB (Financial Suite)
SCADA
Learning management system (Clean Water Learning)
Smart Systems (IoT)
Natural Systems Technologies (UAS, TeraTrak)

Intellectual property
WASSTRIP patent
eWASSTRIP patent
Low-energy nitrogen removal wetland technology patent
Clean Water Grow trademark

[other assets to consider including]
Hagg Lake water rights
Barney Reservoir water rights
In-Stream Water Rights
IGA with Cities (enforce rules and permits)
NPDES – (DEQ enforcement: Pretreatment Ordinances, D&C Standards)
Easements and permits of entry at third-party locations where CWS stewards natural resources, including more than 12 million native plants, and human-made infrastructure
Partner Agreements (Soil Water Conservation, Metro – Access to Distributed Infrastructure)

P.1 a (5) Regulatory Environment

The single largest regulatory driver at CWS is the watershed-based National Pollution Discharge Elimination System (NPDES) permit, which governs industrial and domestic stormwater and wastewater management throughout the Tualatin River Watershed. The NPDES permit is issued by Oregon Department of Environmental Quality on behalf of the U.S. Environmental Protection Agency. Oregon DEQ also regulates air quality at CWS facilities. In addition, CWS is subject to local, state and federal environmental laws and regulations, including some not specific to the water sector Oregon Occupational Safety and Health Administration, Public Contracting and Procurement Laws, Oregon public records law, financial regulations and Equal Employment Opportunity requirements. Treatment plant operators, professional engineers, attorneys and other employees with professional certifications must maintain those certifications.

CWS is guided by and participates in developing industrywide policy guidance as promulgated by organizations such as the Oregon Association of Clean Water Agencies, the Pacific Northwest Clean Water Association, the National Association of Clean Water Agencies, the Water Environment Federation, the Water Research Foundation and the WateReuse Association.

CWS executes many requirements of the NPDES and MS4 permit through intergovernmental agreements with Washington County and the 12 incorporated cities within it. Agreements with local, state, federal and tribal governments drive many CWS programs, services and projects.

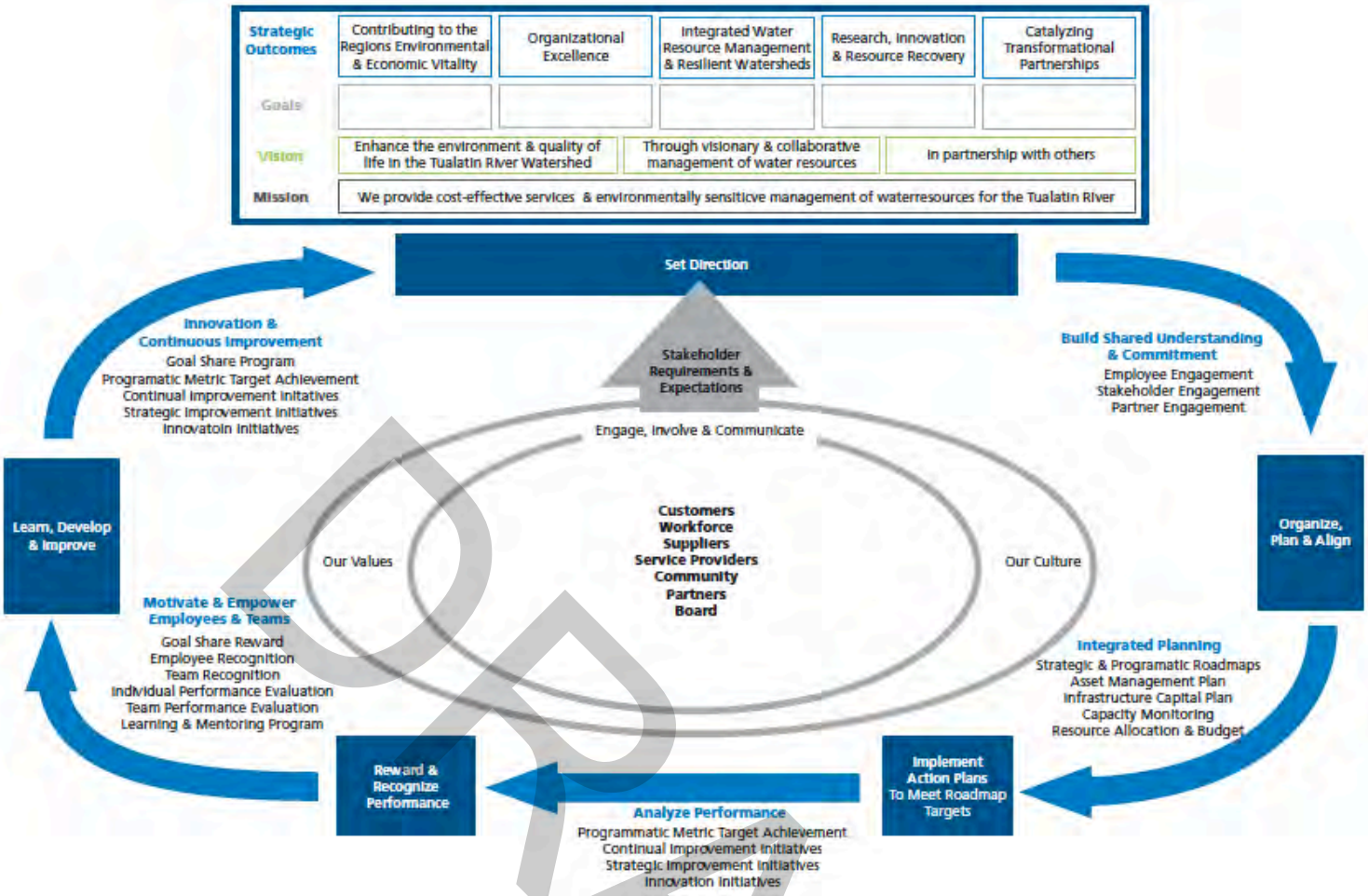
P.1 b Organizational Relationships

P.1 b (1) Organizational Structure

Clean Water Services is a county service district formed under Oregon Revised Statute 451. The Board is elected to four-year terms by the voters of Washington County. The 15-member Clean Water Services Advisory Commission (CWAC), which meets monthly, is appointed by the Board to four-year terms. CWAC's purpose is to review, discuss and make recommendations to the Board on major policy issues and programs. A subcommittee acts as members of CWS budget committee. The CWS Budget Committee includes five CWAC members. Charged with day-to-day operations, the CEO, who is appointed by the Board, implements the Board's policy direction through her direct reports.

P.1 b (2) Customers and Stakeholders

CWS customers are People, Fish & Wildlife and the Environment. Virtually everyone in the urbanized portions of the Tualatin River Watershed is a CWS customer because our product offerings touch everyone who lives, works, and plays in Washington County, Oregon. This includes single-family households, multi-family dwellings, and businesses and organizations of all sizes. Their key expectation is high quality services at reasonable and predictable rates. In the rural areas, residents, farmers and businesspeople count on CWS to practice good stewardship of natural resources. Developers and industries expect clear, fair and appropriate regulations and standards. CWS works very closely with the governments of Washington County and the cities within our watershed; development community (Stormwater), local, state and federal public agencies (e.g., EPA, Oregon DEQ, school districts, Metro regional government); environmental advocates; agricultural



interests; community-based organizations (e.g., Friends of Trees, Centro Cultural, Tualatin Riverkeepers) and neighborhood associations/community participation organizations. All CWS customers and stakeholders expect transparency, responsive customer services, and healthy built and natural environments. Though we cannot ask the environment what its expectations are, we do ask the question to ourselves, "What would Mother Nature do?" This enables us to predict the environment's expectation and deliver on our promise of clean beautiful water and strive to create a resilient and sustainable watershed.

P.1 b (3) Suppliers, Partners and Collaborators

CWS' suppliers, partners, and collaborators are essential to deliver product offerings and customer support services. These relationships are critical to the continual innovation and discovery as these partners nearly double the effective workforce without accruing additional operating expenses.

CWS strives to craft partnerships that are transformative, rather than merely transactional. Through intergovernmental agreements, contracts and other mechanisms, CWS works in concert with the County, its 12 partner cities; other water organizations (e.g., Joint Water Commission, Tualatin Valley Irrigation District); other public agencies (e.g., U.S. Geological Survey, Bureau of Reclamation) to advance our key strategic outcomes.

Key supply-network requirements involve keeping inventory lean enough to be efficient, but ample enough to avoid any interruption to the 24-7-365 operations on which public health and the environment rely.

Element in CWS supply chain include used-water, stored water, and raw materials such as chemicals, energy, pipes, pumps, and mechanical and electrical instrumentation.

P. 2 Organizational Situation

P.2. a Competitive Environment

P.2. a (1) Competitive Position

The CWS market area is the 712 square-mile Tualatin River Watershed encompassing the 84-mile-long Tualatin River and 900 miles of streams. The relative size and growth of the water industry and the markets CWS serves are directly dependent on the economic conditions of the region (i.e., population growth and job growth, the available water supply, and drivers associated with innovative water resources practices. The CWS service district population is greater than 600,000 people and is expected to increase by 1.10% each year for the next five years and to add an additional 122,000 people – an increase of 20% – by 2030.

CWS and its many partners continually rebalance their agreements related to providing the product offerings that the federal permit requires, and the community counts upon. As a member of the Leading Utilities of the World network and a recognized Utility of the Future – CWS is known nationally and internationally for its outstanding innovations and impact. In addition, CWS has positioned itself to effectively compete at the national and international level through the Clean Water Institute, the affiliated nonprofit that advances watershed restoration and resource recovery through innovative strategies and promotes scientific discoveries, education, and environmental protection activities that benefit watersheds throughout the nation and around the world.

P.2. a (2) Competitiveness Changes

CWS is directly and strategically taking on major challenges, including water supply planning and security, a complex regulatory environment, aging infrastructure, wildfire, pandemic and climate change. CWS has joined – and in many cases created or co-founded – many collaborations designed to meet these challenges. Examples include the Tualatin Joint Project, the Isle Utilities Pacific Northwest Technology Advisory Group, the Tualatin Watershed Enhancement Collaborative, the Portland STEM Partnership and many more. Only through the kind of innovation, collaboration and transformative partnerships to which CWS has dedicated itself for decades will the organization respond to these challenges in the way customers and stakeholders needs it to, and maintain the region's appeal as a place to live, recreate, visit, work and invest.

P.2. a (3) Comparative Data

One of CWS' key values is to support decision-making and performance management based on up-to-date, scientific and technical information. The organization dedicates resources, including the Business Strategy and Performance Systems program, to collecting, analyzing, and benchmarking data to drive decisions and identify opportunities.

The key source of national comparative and competitive data for the water resources industry is made available through the American Water Works Association Utility Benchmarking annual survey. The survey, which is voluntary, collects utility performance indicators in five areas, including organization development, business operations, customer service, water operations and wastewater operations.

Key sources of international comparative and competitive data include The International Benchmarking Network, European Benchmarking Co-operation, International Water Association Benchmarking Water Services and Asset Management Customer Value.

Major limitations to comparative and competitive data result from the voluntary nature of collection, variation in data collection methodology, limited verification of data, comparison data being reported to the effective quartile, lack of standardization and limited resources required for participation.

Major Challenges	Major Advantages
Climate change	Workforce: Skilled, dedicated, engaged
Rapid urbanization	Community: Informed, supportive, values-aligned
Complex regulatory environment	Board: Visionary, dedicated
Aging infrastructure	Recognition: International, national, regional
Water supply and security	Organizational culture: Kind, innovative, systems-oriented
Succession planning	Financial stability
Equity policy	Transformative partnerships
Natural disaster	Provider of essential services
Pandemic	
Economic volatility	

P.2. b Strategic Context

P.2. c Performance Improvement System

CWS uses Lean Six Sigma methodology and Plan-Do-Check-Act as well as ISO 55000 standards to systematically evaluate asset conditions and risk at an enterprise-wide scale. The CWS Goal Sharing Program, established in 2004, links employee compensation with new ideas and process improvement to return value to CWS customers.

The District has embarked on their Performance Excellence journey and has been using the Baldrige Excellence Framework for self-assessing performance in process, planning and operations since 2018. This is the District's first submission of the Performance Excellence Northwest annual application. The aim of submitting this application is to garner buy-in from the workforce and receive an external evaluation, opportunities for improvement, and recommendations on mechanisms for improving overall systemwide performance.

The District has invested in a performance management software, ClearPoint Strategy. This software allows CWS' leadership to evaluate performance across the five Key Strategic Outcomes. When ClearPoint is fully deployed, all staff will have access, and it will be a key tool for employees to exercise leadership within their sphere of influence by identifying and tracking measures and targets for their and their teams' work. These measures are linked to programmatic and strategic roadmaps and provide the workforce with a high-level understanding of how their day-to-day work and initiatives connect to the mission, vision, values and promise.

5. Workforce Category

5. 1a(1) Capability and Capacity

The District evaluates workplace capability and capacity on an annual basis as part of the budget process. Each year, Business Partners work with the department managers and supervisors to identify staffing needs and resources. The department considers factors such as current performance requirements, ability to meet the needs of the community, NPDES permit requirements, design and construction standards, as well as District initiatives and goals. Staff supervisors use information from the annual performance review process to help determine if employees have been trained in a new competency or skill, obtained a certification or license, and can be better utilized within the District. The District also takes into consideration the current demographics, future retirements and career development plans as identified in annual performance reviews. Based on the outcome of that review, executive leadershipdetermine if the District can effectively operate and sustain performance with the current staff, available skill level, competencies and education for the upcoming year, along with identifying long term staffing needs for each department. If executive leadershipdetermines the District does not meet staffing needs, staff supervisors and directors will work together to analyze the gaps in staffing and determine justification for any needed changes. Changes in staffing needs may include adding new FTEs; utilizing temporary workforce, contractors or internships; or redesignating current positions to better reflect the needs of the District and actual work that needs to be performed. Once staffing needs have been identified, both short term and long term, departments submit requests for new FTEs and redesignations, including justification for review. Long term plans are presented to the business partners and strategic work plans are identified. All new FTEs and redesignations are reviewed and prioritized by the CEO and Business Partners based on strategic objectives, performance and budget allowance. Based on that review and prioritization, changes approved by the CEO are submitted as part of the budget process to the CWS Board of Directors for approval to be adopted to the fiscal year budget. The CEO will consider the long term staffing proposals when finalizing and approving organizational restructures to help drive performance and innovation.

The District also evaluates staffing levels based on business needs throughout the fiscal year. If department directors determine there is a need for changes in staffing or organizational structure, a proposal is sent to the CEO for review. Any approved restructures, staffing changes or position redesignations are taken to the CWS Board for mid-year approval.

5. 1a(2) New Workforce Members

The District has a detailed recruitment and selection process that is consistently applied to open positions. This process is intended to provide the District with highly skilled, professional employees who represent the community we serve. Our focus is to hire the most qualified candidate for the job.

The District collaborates with management to follow the systematic process outlined in figure A. The recruitment and selection process begins when a vacancy is identified. This vacancy may be temporary, regular or an internship. Utilizing NeoGov, an HR software suite that includes job information and applicant tracking, the hiring manager works with Human Resources on the steps in the recruitment process to fill the vacancy and onboard a new workforce member. Our interview questions are structured to include technical and behavioral requirements of the position, which are then evaluated by a panel through the interview process. The District encourages diverse and innovative thinking, along with the ability to build successful working relationships across all departments and the community. It is important to us that the interviewee's fundamental nature aligns with our mission, vision and values, and they show a passion for the work that we do. Once a finalist is selected and successfully completes the pre-hire screening process, we identify a hire date

to begin the District's onboarding process. The onboarding process includes general orientation that introduces the culture, applicable policies, and safety guidelines. Employees then receive initial training within their department on job functions and related competencies.

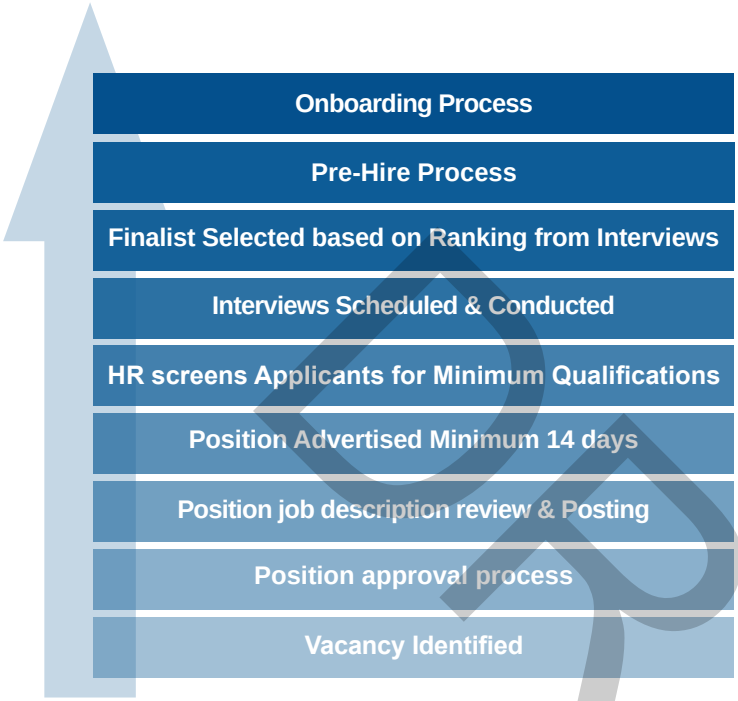


Figure A

Leadership, in partnership with Human Resources, works to retain workforce through competitive pay, benefits and flexible work schedules. Career development and continued education are also of high importance at the District andused in efforts to retain staff through job satisfaction, creativity and career development. Each year, departments receive funds for training and education, which are intended to be used for certification reimbursement, continuing education and training or seminars. The District Business Partners are continuously evaluating the workforce and needs for growth and career paths. Based on the career development plans set by employees and their supervisors, career paths are then articulated and provided based on business needs. Some areas for growth include higher class pay and lead pay. These are incentives provided to employees for taking on additional responsibilities to increase their knowledge, experience and skill level. It is not uncommon for supervisors to underfill positions to allow employees to gain the skills and knowledge needed for higher level positions.

It is important that the District's workforce represents customers within the community we serve. Through our open competitive recruitment and selection process outlined in figure A, we advertise external job postings on multiple platforms, including but not limited to, job boards, flyers, internal notices, diversity and veteran websites, colleges and universities, professional organizations, and social media outlets. In order to balance the need for diversity with qualified candidates, many departments will post entry level positions with the intent to train and promote. We also ensure candidates are selected based on a consistent review of minimum qualifications and interviewed by a diverse panel of District staff.

5. 1a(3) Workforce Change

Leadership prepares the workforce for changing capability and capacity needs through training, education, communication and staffing. Leadership looks across the community to forecast growth and monitor the resources needed from the District. It is important to the District that we develop partnerships with community members that are transformational to help ensure we understand community needs. The District will train and educate employees to ensure they have the skills and competencies needed to sustain the growth. If management feels they have staff that possess the potential for additional growth and development,they will use budgeted funds to provide education and/or training. Supervisors will work with their employees on career development plans to ensure they have the staffing needs available for future demands.

To help manage the needs of the workforce and ensure continuity, Human Resources continuously evaluates and modifies job descriptions, along with reviewing and adjusting policies to maintain flexibility and changes in processes or regulations. Each department also reviews upcoming retirements to prepare for recruitments or develop succession planning opportunities. The District minimizes the impact of workforce reductions through fiduciary management of the annual budget and the growing demands of our regional economy.

To help manage periods of growth, the District considers midyear budget changes, utilizes a budget for hiring temporary workforce and/or interns, and provides opportunities of higher class pay to utilize the current workforce's available knowledge, skills and abilities.

The District uses many methods to communicate and prepare the organization for changes as outlined in figure B:

Figure B

5. 1 a. (4) Work Accomplishment

Executive leadership organizes workforce around optimizing our operations and promoting our innovative culture. District staffactively engages with Washington County as part of their job expectations in order to evaluate the external environment and overcome obstacles with District operations. Based on the evaluation of the community, executive leadership may choose to alter staffing plans, restructure departments for greater efficiency or modify the budget. The District places high importance on recruiting and retaining a workforce necessary to ensure we can meet the demands of rate payers and sustain operations as Washington County's population grows. Executive leadership identifies the short-term workforce requirements and works with HR to take proactive efforts to attract and retain highly qualified staff. Supervisors continuously evaluate job descriptions, knowledge, skills abilities and competencies required to sustain operational resiliency and business strategy requirements.

The District has created the necessary performance management systems in order to align employee incentives, compensation, and performance expectations with our mission and strategic priorities. Supervisors evaluate individual employee's performance as it relates to the District strategic goals, along with providing a goal-sharing bonus program that rewards employees for meeting performance and organizational goals.

5. 1 b. (1) Workplace Environment

The District's top priority is maintaining the health and safety of our employees. Our Human Resources and Risk Management team manage District practices to ensure we are compliant with Occupational Safety and Health Administration (OSHA) regulations and standards. This includes developing, implementing, reviewing and updating all safety policies, practices and training, enforcing safety standards and taking corrective action as needed. The District has a detailed safety training plan and ensures staff are completing the required training for their position and the safety sensitive functions. Training requirements are job specific and include OSHA required training, along with District safety policy enforcement. Employees are separated from specific known hazards with personal protective clothing and equipment, along with provided a monetary reimbursement for safety equipment and gear such as boots and glasses. The District also takes steps to manage internal and external theft, such as electronic security systems, cameras, alarms, and restricting access to various parts of the facility to authorized personnel.

The District supports four local safety committees (LSCs) and a Central Safety Committee. All employees are represented by one of the LSCs and encouraged to contact them for assistance with safety related concerns or needs. Employees are made aware of the different reporting avenues for safety concerns. The LSCs and District management continuously monitor and evaluate the workplace to proactively prevent incidents, ensure compliance and correct any safety violations or concerns.

5. 1 b. (2) Workforce Benefits and Policies

Employees are our greatest asset, and play a key role in the success of the District. In order to support a highly skilled, diverse workforce, and recognize the dedication our employees demonstrate each and every day, Clean Water Services offers comprehensive benefits, listed in figure C, as part of a total compensation package. Employees are offered different options for benefit plans to elect and fit their individual and family needs. Benefit services and vendors are evaluated on an annual basis to ensure they are competitive, meet the needs of our workforce, remain affordable and are easily accessible.

The District reviews and modifies policies to reflect changes in District practices, laws and regulations. Benefit and policy information is sent out to employees through mail, email and our The Pipeline newsletter throughout the year. This communication provides employees with updates, changes and new offerings that may impact their employment, services available and benefit elections.

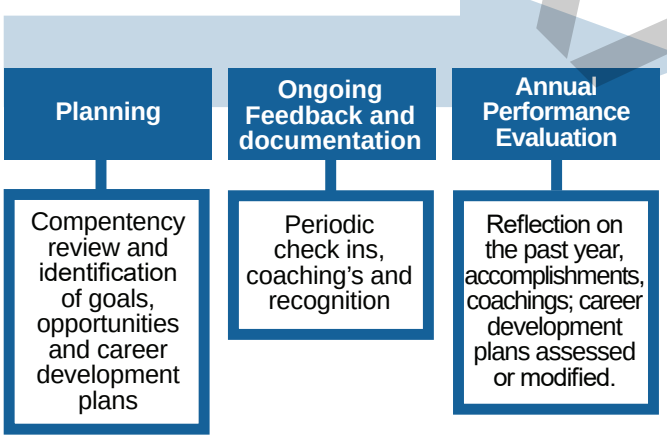


Figure C

5. 2 a. (1) Drivers of Engagement

Drivers of employee engagement are determined through employee check-in meetings with staff supervisors, engagement surveys and annual performance reviews. Drivers are also identified based on the impacts of the District's performance and industry standards to individual employee engagement. Management uses identified drivers, along with District performance, as a way to evaluate current structures, practices and policies within each work group to survey employee engagement. While the overall District drivers of engagement are the same, they may be applied differently to workgroups and programs based on both the individual employee job functions and overall programs strategic contributions and performance.

5. 2 b. Organizational Culture

In order to foster a culture of communication, high performance and engaged workforce, executive leadership and management start by regularly communicating our vision and helping employees recognize the connection between it and their job functions. This is done through check-ins with staff by the CEO, department level meetings with District updates, and internal communication through the Pipeline, email, websites and social media feeds. In order to foster open lines of communication, the District offers employees multiple levels of resources, in the form of management and Human Resources. The District has a culture that places value on collaboration, which is demonstrated in learning opportunities and knowledge sharing between departments, social and holiday events for all staff, and relationships built with external partners and the community.

Directors work with their supervisors and staff to develop department measures that center on the overall District's strategic plan and performance goals. These measures are included in the District's Goal Sharing program and all employees are provided with a bonus incentive for completing measures. By having staff participate in meeting these department measures, employees are empowered to think big picture and provides them with an overall connection to the vision. By providing an incentive, the program promotes a positive culture and reinforces high performance. Management works to develop employees by providing meaningful work, periodic coaching and annual performance evaluations. Employees are encouraged to be innovative and are provided with the resources and education needed to engage performance and achieve results.

In order to further promote the organizational culture, Human Resources partners with management to hire candidates who meet position qualifications, along with having the required knowledge, skills and abilities in order to autonomously perform jobs and promote engagement. Candidates selected for a position with the District, are introduced to the internal culture through our onboarding platform and during new hire orientation. The District also places importance with branding and setting a positive image with all District interactions. This can be seen with the Districts internal and external websites, media and social networking, along with logo placement on clothing, vehicles and signage.

The District has a Diversity, Equity and Inclusion (DEI) initiative that is guided by executive leadership. While we are still working to prepare our strategic goals for equity and inclusion, executive leadership, management and supervisors continuously take an inclusive approach when working with others and serve as role models for open communication. Employees are encouraged to collaborate with others, share their stories and experiences, and focus on building relationships that help create an inclusive culture with an overall connection to the natural environment.

5. 2 c. (1) Performance Management

The District's pay delivery system for employees consists of two elements: performance-based pay and goal sharing. This system has been extensively reevaluated to refine and improve the overall programs to better connect employee compensation to measurable business results.

The District has an annual performance management system that sets expectations and guides employee performance, as outlined in figure 5. 2C1. Staff supervisors use this system as a way to coach and manage employee performance, along with ensuring goals and career development plans are identified, revised or met. The annual performance management system includes a rating of employee performance that is accompanied by a 0-5% pay adjustment. Staff supervisors and employees are encouraged to align performance goals and feedback with the Districts overall vision and strategic plan. By integrating the Districts vision and strategic plan into annual performance review process, managing goals and reviewing career development plans, the District reinforces the value it places on employees and therefore supports high performance.

The District reinforces intelligent risk taking through its Goal Sharing program. Department Directors work with supervisors and staff to identify measures that are included in the program. These measures are created as a way for overall process improvement, reaching optimal organizational performance and providing exceptional customer service, which all play an important role in how we interact with and serve the community. Employees are incentivized through an annual bonus for the District successfully meeting identified measures, which is considered an element in total compensation. The amount awarded to staff is based on the outcome of an annual auditing process of the Districts accomplishment's relating to those measures. The District's goal sharing program has been very successful in promoting cost savings and service enhancements by encouraging both practical and innovative employee approaches and solutions to improve delivery of priority services to ratepayers. This goal sharing program provides a critical linkage between employees' achievement of meeting targets, working together and the related financial compensation. This will help continue the trend of increasing employee productivity. 5. 2C 1

5. 2 c. (2) Performance Development

Learning and development is an integral part of the Districts culture. Leadership places high value on learning and encourages personal development as a way to foster innovation and internal growth. The District utilizes internal learning management systems as a way to manage and track training. Trainings include courses offered with Clean Water Learning, required safety and ethical business practice training, and optional training opportunities that provide growth for employee's knowledge, skills and abilities. With these systems, employees are also able to track their personal educational

achievements, courses and professional memberships. While the District is still in the process of implementing the full capabilities of these systems, some of the current trainings offered include supervisor training on ethical business practices, information technology training on computer security and training videos on department functions. The District also uses these systems as a way to create and offer training opportunities for the community we serve.

One main function of these systems is for tracking Passport educational opportunities offered through a District goal share measure. This measure has been created as a way for employees to share knowledge and experiences of job functions across the department. Completion of the measure is based on how many employees participate in the learning opportunities. The District offers tuition reimbursement as a way to incentivize employees to seek educational opportunities, obtain certifications or provide growth training opportunities. As a way to aid employees with growth and development, departments annually budget funds for training and development purposes, which may include attending conferences, webinars, professional workshops and seminars. By providing tuition reimbursement option, training funds and bonus incentives, the District is demonstrating intelligent risk taking in hopes that employees will use the additional knowledge, skills and abilities they obtain from the continued education as a way to grow within the District. Executive leadership evaluates and manages department structures as part of an initiative for succession planning and utilizing employee's education, training and development for growth opportunities.

5. 2 c. (3) Learning and Development Effectiveness

The District has a comprehensive and interactive learning and development system. Supervisors focus on the training program as a way to help with staying compliant, meeting permit requirements and maintaining a low safety incident count. The District uses goal share as a method to promote learning and development and enhance engagement. With the addition of the "passport learning", employees are able to expand their understanding of District wide operations and apply the knowledge to their current positions. It also gives them more visibility to growth opportunities or career paths within the District.

A recent focus has been using the learning and development process to help employees understand the importance of maintaining a respectful and professional work environment. This has shown to help with lowering disruptive employee relation issues and increasing productivity, which helps with achieving overall business results. As a way to further develop the leaders within the District, Human Resources is expanding training offerings to include new and future supervisors. This provides the opportunity for Human Resources to identify gaps in knowledge for current and future leaders, along with providing them with the tools needed for developing an engaged workforce.

Along with District wide training, each program has specific learning and development requirements that helps ensure employees are competent within their positions and able to make informed decisions for maintaining effective operations. Within this training system, employees receive on the job training for growth and development in order to promote engagement and encourage job empowerment. The employee/supervisor relationships and department training is vital in our growth and has provided opportunities for internal staff to qualify for promotional opportunities. This one on one approach also helps with fostering individualized development plans and the frequent feedback needed for engagement.

5. 2 C (4) Career Development

Career development is managed through the Districts annual performance review process, collaboration between supervisors and employees, along with evaluation of department needs. Supervisors and employees are encouraged to review job descriptions, position duties and communicate with employees on growth opportunities. By reviewing this information and workflow processes, supervisors determine if there are career opportunities within

the program and provide on the job training, out of class assignments or lead responsibilities. Supervisors also use paid training opportunities, education and license/certification reimbursement as a way to encourage employees to increase knowledge, skills and abilities, along with gaining experience to grow within their position.

In order to successfully succession plan for leadership and key positions, the District monitors for upcoming retirements and turnover. The supervisor's partners with Human Resources in order to continuously manage and strategically prioritize recruitments as a way to allow for succession planning and transfer of knowledge. Department's may also consider hiring retired employees, or those who are transitioning out of the District, on a temporary part time status to help aid in the training and transfer of knowledge process.

5. 2 Workforce Engagement

Clean Water Services is committed to creating an engaged workplace in order to gain a harmonious environment in which each team member is invested in the success of District. As an employer who provides services to the community in the water resource recovery field, employees are passionate about their work in this unique field, along with serving the needs of the public.

In order to engage our workforce for retention and high performance, the District focuses on areas such as performance management, communication and empowerment. The District has an annual performance review system to help ensure employees are receiving the feedback, coaching and recognition necessary to stay engaged. We also offer monetary incentives through the annual review process, along with an annual bonus from our goal sharing program. This reinforces high performance and connects employees to District and department goals. Along with providing employees with feedback, communication and incentives, the Executive leadership promotes innovation and process improvement. This inspires employees to feel motivated and empowered.

Understanding What the Public Expects of CWS

- **Mark Jockers,** Clean Water Services Chief of Staff
- **Victoria Lara,** CEO and founder of Lara Media Services
- **Jairo Rodriguez,** Associate Project Manager at Lara Media Services

Clean Water Services strives to ensure our projects, programs and initiatives are consistent with public values and expectations. We actively engage with our community and customers through educational partnerships, community involvement, surveys and focus groups.

CWS worked with Lara Media Services (LMS) to help us identify where and how the priorities and interests of external audiences align with — or diverge from — the CWS Key Strategic Outcomes and business priorities. The 2021 Stakeholder Research is the first comprehensive executive interview process CWS has conducted since the Board appointed Diane Taniguchi-Dennis as CEO, we developed our Strategic Approach, and we began a reorganization.

CWS and LMS worked collaboratively to narrow the list of stakeholders to the most critical voices that represent the county's many interests. Diane emailed more than 50 potential stakeholders to participate in this research, then LMS followed up with emails, phone calls and networking with participating stakeholders. A total of 29 essential stakeholders participated in the process. All are working or serving in CWS' service area, including city elected officials and city managers; and representatives of environmental interests, agriculture groups, businesses and industries, nonprofits and community partners.

Victoria Lara will review the results of the findings for discussion with the Board of Directors.

Stakeholder Research Report

October 2021

laramedia.com
503-210-5427 | contact@laramedia.com
2156 NE Broadway St. Portland, OR. 97232

Clean Water Services

Prologue

Clean Water Services is a thriving organization with the mission of restoring and protecting the Tualatin River holistically to provide a sustainable freshwater source for urban Washington County. The stakeholders interviewed recognize that CWS is committed to transforming the organization into a more open and accessible agency to serve Washington's County residents better. Thus, it is necessary to continue investing time and resources to prioritize partnerships as much as tasks.

CWS must improve the clarity and transparency of permitting, manage projects more collaboratively, and strengthen its partnerships. Building authentic partnerships requires time and implementing tools to work through conflict, an open dialog for challenging conversations, and understanding power and privilege dynamics in the context of the partnership. Stakeholders with less structural power and privilege are often perceived as disruptive, passive, or hesitant to more privileged partners who think of themselves as bold and visionary.

This process requires an honest examination of history, how public policies have benefited some while burdening others. In all human systems, there will be intersecting identities and, thus, intersecting power structures. The process of building authentic and equitable partnerships requires not only having a conceptual agreement about guiding principles and practices for mutual accountability or a shared internal power analysis and commitment to intentionally balancing power but also the skills to bring those conceptual agreements to life. Our research pointed to open communication, collaboration, transparency, education, and sensory feedback as the topics to address in the next phase of CWS's desire for organizational betterment for the stakeholders they serve. Constant communication and feedback are needed in any relationship. Without constant growth comes stagnation, and with stagnation comes dissatisfaction. Lara Media Services would like to thank CWS and Tripp Somerville of NeverStill for the collaborative effort in gathering essential stakeholder feedback to better CWS. CWS has many strengths to its credit.

Table of Contents

Introduction

"Knowledge is an asset possessed by our workforce and our organization in the form of information, ideas, learning, understanding, memory, cognitive and technical skills, insights, and capabilities. Developing methods to carry out the process of knowledge management, ensuring the approach is applied consistently, sharing refinements and innovations with departments and programs, and integrating across CWS in support of our mission, vision, promise, and values is key to the long-term effectiveness of our organization."— Clean Water Services, 2019

Clean Water Services (CWS), the water resources management utility of urban Washington County, protects the health of the public and the Tualatin River. CWS works with 12 member cities to serve over 600,000 people in urban Washington County while protecting the county's only river. The river has more than 12 tributary creeks draining into it. Formerly the Unified Sewerage Agency, CWS has worked tirelessly for over 50 years to restore the natural beauty and wildlife habitat of the Tualatin River. Award-winning and nationally recognized, CWS programs and facilities are top-notch and provide the county many advantages yet to be recognized by most Washington County residents.

CWS hired Lara Media Services (LMS), in collaboration with Neverstill, to identify where and how the priorities and interests of external audiences align with and/or diverge from the most critical CWS business goals. CWS, Neverstill, and LMS worked collaboratively to narrow down the list of stakeholders to the most critical voices that represent the county's many interests. City representatives, businesses, developers, agriculturalists, and environmental partners were all involved and essential to the process through their feedback.

CWS's commitment to providing efficient and innovative regional sewer and surface water management along the Tualatin River has been successful. The dedication of CWS to engage and learn from the communities they serve is evident. They recognize the essential role of providing reliable, lifeline public health services now more than ever. By providing opportunities to invite and listen to key stakeholders, CWS is looking to connect and learn from them. That way, CWS can establish and improve partnerships and alliances to develop a stronger, more resilient, and equitable society for all.

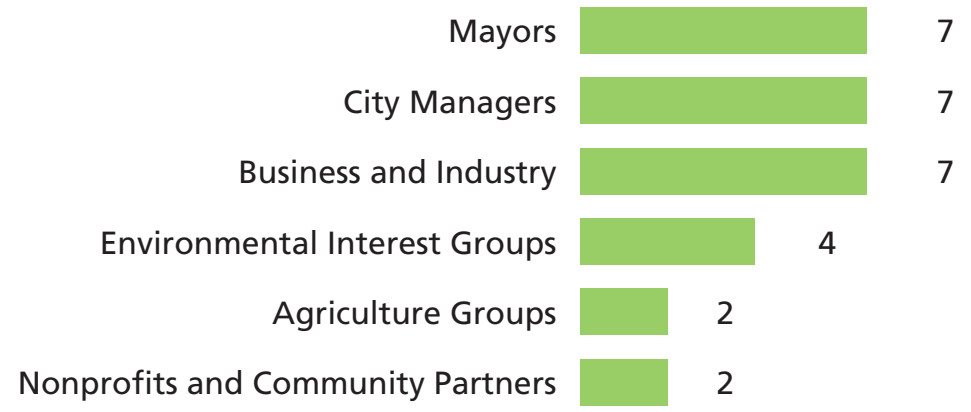
Objective & Methodology

The research objective is to identify where and how the priorities and interests of external stakeholders align with and/or diverge from the most critical CWS business goals (Clean Water Services, 2019).

This is to be accomplished by conducting stakeholder interviews. The purpose of the research is to assess community leaders:

- Awareness of CWS as an organization, including its values, priorities, and business goals.
- Attitudes toward CWS and an assessment of the organization's job performance.
- Evaluation of CWS's existing communication and insights about stakeholder's informational needs.
- Research emphasis on city leaders (mayors and city managers) and representatives of communities of color.

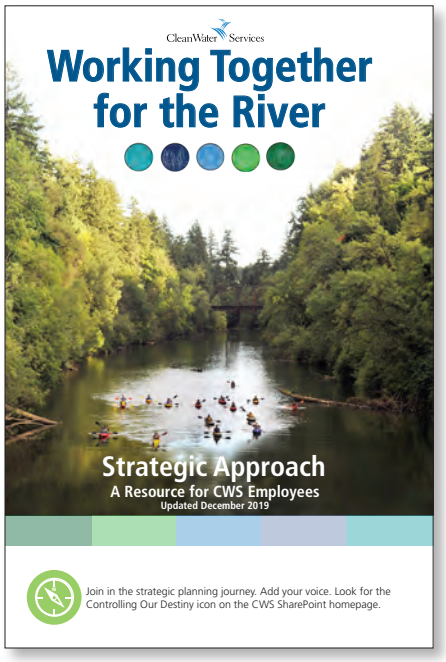
Stakeholder Groups



CWS and LMS reached out to over 50 potential stakeholders to participate in this research. They were communicated via email from Diane Dennis-Taniguchi, then followed up by LMS through emails, phone calls, and networking with participating stakeholders. A total of twenty-nine essential stakeholders participated in the process. All are working or serving under CWS's service area, including city elected officials— such as most Mayors of Washington County's cities, appointed city officials, environmental groups, agriculture groups, essential businesses and industries, nonprofits, and community partners.

LMS conducted twenty-four interviews and five surveys. The interview questions consisted of qualitative and quantitative questions and took an average of 30 minutes to complete. The survey was slightly different, being primarily quantitative to be more time-flexible. The shortest time taken for the survey was just over 2 minutes, and the longest being over 2.5 hours. All the responses are 100% confidential, with no indicator marks.

Objective & Methodology (Cont.)



LMS used the following outcome indicators of the Key Strategic Outcomes for the *Working Together for the River* report of 2019 to assess the successes and opportunities for improvement of CWS.

Key Strategic Outcomes (Clean Water Services, 2019)

- **Organizational Excellence**
- **Integrated Water Resource Management & Resilient Watershed.**
- **Research, Innovation & Resource Recovery**
- **Catalyzing Transformational Partnerships**
- **Contributing to the Region's Environmental & Economic Vitality**

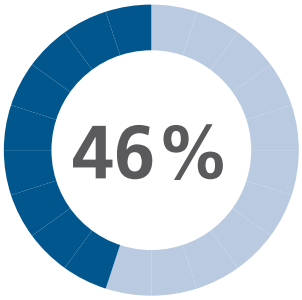
LMS worked extensively to capture stakeholder feedback through Zoom Video Conferencing, phone calls, and inviting and leveraging the people interviewed along the way to encourage other stakeholders to participate.

Summary and Insights

Strengths

- Most of the stakeholders stated that CWS has been very successful in its commitment to protecting the public health of the communities they serve and the health of the Tualatin River. CWS has a solid reputation for its Tualatin River watershed restoration work.
- Everyone recognized that CWS has long efficiently and successfully provided environmentally sensitive regional sanitary sewer management. The majority of participants acknowledged the different ways CWS has contributed positively to the environment, such as controlling the river's water temperature, stormwater, and wastewater management.
- Several interviewees mentioned how CWS tracked signs of COVID-19 in Washington County's wastewater to help public health officials detect the presence and scope of the virus in their communities.
- Under the leadership of Diane Taniguchi-Dennis, CWS is known for being a different organization by stakeholders, stating that communication, partnerships, and outlook of CWS are more optimistic now. Over the last few years, many credit Diane for the agency's effort to partner with cities and municipalities, citing her experience as the key to CWS's transformation.
- CWS is viewed differently today with much more positive expectations; Stakeholders say the change in leadership has been the critical factor in its improvement. In addition, many CWS employees are recognized for going above and beyond to find solutions that address the challenges and problems the communities endured.

Opportunities



City leaders are eager to build more authentic partnerships with CWS

Partnerships.

CWS permit and development services are viewed as a regulator instead of a partner.

Many view CWS as a powerful organization that lacks the willingness and the empathy to find solutions to the city's urban development needs and goals. They want to build a more robust and authentic partnership with CWS.

> *"Creating project ownership refers to a series of activities related to presenting and discussing a project to engage the community to participate actively. The community must be consulted and involved sufficiently that they consider the project as their own."*
>
> —Water Integrity Network

Ownership.

There is a lack of CWS project ownership (buy-in) among the stakeholders. Many stated a lack of transparency in how CWS makes decisions, authorizes or negates development-related permits, and raises utility rates. Stakeholders don't feel satisfied with how CWS conducts the permit process because it affects their projects.

The participants were not aware of the array of CWS' resources, projects, and benefits. Stakeholders expressed a desire to be engaged more frequently and be invited to truly participate in providing and sharing their ideas, stories, and challenges on the CWS processes.

Permits.

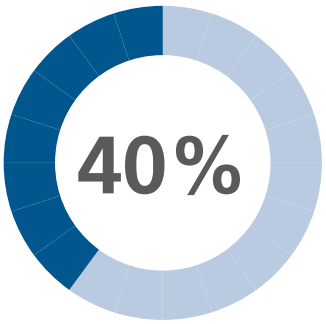
CWS permitting is not viewed as a transparent and efficient process. Participants stated there is a need to streamline the process to improve permit turnaround.

Most of the participants from every stakeholder group viewed the process as complicated and confusing. Some interviewees also commented that dealing and communicating with CWS's employees in that department is not always easy or pleasant. When asked what needs improving, the words were: transparency, processes, timelines, simplicity, and clarity.

City stakeholders feel uncomfortable representing CWS and telling businesses and residents that their permits are not approved. The reality is the cities feel there is a lack of direct CWS-to-client engagement and stakeholders feel the negative pressure to act as a filter of critical feedback for CWS, fearing that much of the valuable feedback is being lost during this process. They wish CWS could establish tools, resources, and opportunities to engage and partner with cities to explain their process, values, and vision.

> "It was hard to get the engagement we needed on [an] issue. Maybe that was more from our city staff, but it seemed like both our staff and CWS's staff when I first brought up the issue were like, 'we can't do anything about that.' Eventually, they worked and found a solution, but being more open when people are raising issues and not falling back on the 'we can't do anything about that' response because the public won't accept that."
>
> – City Official

> "Their role in permitting projects is very important, and I think it's perceived as an opportunity for improvement in terms of communication. Direct feedback from our real estate team would be that CWS standards are nearly impossible to understand. I have never had a project that was approved without comments from our real estate folks. In several instances, the cost of the permit exceeded the cost of the project. It's a painful point for not only municipalities but developers and property owners that are starting to get off the ground."
>
> – Business and industry



Participants would like to see more information about CWS

Strategic Communication and Outreach.

Many participants think that CWS has a unique and substantial opportunity to share, inform, and engage with their target audiences by communicating and engaging through increasing branding awareness and developing trust and ownership of CWS's values, vision, and commitment. Several mentioned stormwater, sewer protection, and river pollution are essential topics to learn more about. Also, stakeholders commented that they would like to see more simplified or easy-to-read reports from CWS frequently to be aware of CWS's work.

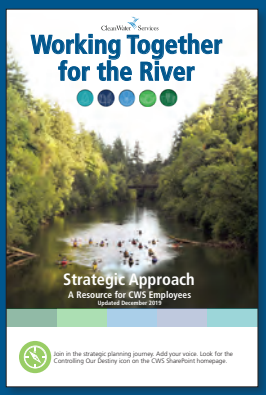
Around two-fifths of the participants mentioned they would like to see more information about CWS. City officials mentioned wanting to know more about the utility financial assistance services CWS provides, how CWS uses fees, and why it is essential for CWS to increase fees. More research is needed to learn about messaging communication challenges.

> "They are doing good things, but people don't see it."
>
> – City Official

> "CWS has a very good quality relationship with our community and us... This interaction could be better with more outreach and communication, as well as just getting more information out there about what our water quality is and what they're doing to improve it."
>
> – Business and Industry

What's meeting good practices

Representation of keyword mentions by stakeholders when asked: What is the first thing that comes to mind when you think of Clean Water Services?



Findings > What's meeting good practices

Organizational Excellence > Reputation Management

Stakeholders know CWS as a hard-working utility company that epitomizes the phrase "clean water." The organization that returns water to the environment in a safe, clean, and healthy manner.

> "I think of them as this semi-environmental agency that also serves us for our public utilities."
>
> – City Official

> "For me, it's in the name; it's about clean water and recognizing all the work that goes on --- because as a vital resource, it's easy to take it for granted and get used to how easy it is to get clean drinking water but also clean water going back into our systems."
>
> – Nonprofit and Community Partner

Clean Water Services is recognized for doing an excellent job protecting the Tualatin Basin and being an innovative organization.

> "They're very thorough and diligent in the work they do, and they're putting a lot of earnest energy in the right direction."
>
> – Agricultural Group

Diane Taniguchi-Dennis is credited for the improvements noticed by stakeholders. CWS is recognized as a different organization under her leadership. Respondents consistently noted that the agency's communication, partnerships, and optimism are more evident. City managers and mayors, particularly, noted Diane's influence in CWS's efforts to be a better strategic partner with municipalities.

> "They have become more flexible with cities and change practices that are beneficial. The change in leadership with new perspectives. They are more open to cities' perspectives."
>
> – City Official

"Diane is an amazing leader, and she has a lot of credibility because she worked for the city of Albany as the public works director, so she knows how cities work. She's also a strategist; a big picture person who sees the whole landscape and understands it's not just about the sewers."

– City Official

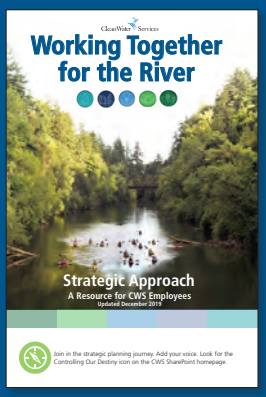
"[T]he previous leader was sure he knew all the answers, and this made interactions frustrating. Now with new leadership, communication is better, and we are able to work together towards a solution."

– City Official

The hiring of Joe Gall gives many city leaders hope that CWS will continue in a positive direction of partnership and collaboration. It is seen as a well-thought-out move to reach cities comprehensively.

"I'm looking forward to Joe Gall, who they just hired; I think this is part of Joe's wheelhouse, communications with public entities."

– City Official



Findings > What's meeting good practices (cont.)

Integrated Water Resource Management & Resilient Watersheds > Protecting Public Health & Ecology & Watershed Health

The United States Center for Disease Control and Prevention defines public health as "the science and art of preventing disease, prolonging life, and promoting health through the organized efforts and informed choices of society, organizations, public and private communities, and individuals. It is achieved when every person has the opportunity to attain [their] full health potential," and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances."

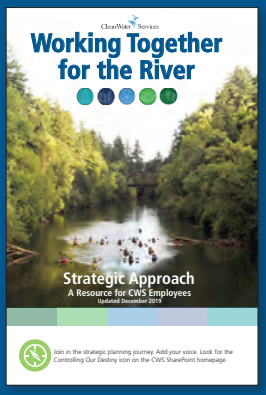
Health inequities are reflected in differences in length of life; quality of life; rates of disease, disability, and death; severity of disease; and access to treatment." According to stakeholders, water and wastewater treatment are essential to protect public health. CWS has proven to stakeholders that they are one of the nation's best water utility organizations to protect and sustain water sources.

Most of the stakeholders, 86%, considered CWS successful in protecting the local environment and believe CWS is very successful at restoring and protecting the health of the Tualatin River, guarding the health of communities through their current approach, and admire CWS for its long-term planning. Also, 71% of stakeholders believe CWS has a significant, positive role in public health.

> "The Tualatin River Watershed is much healthier than 30-40 years ago. Stream restorations are happening throughout the county. That's been very successful. There is a role with sewer sanitary, which is a part of community health. I did not think of CWS as in the Health business, but I may have to rethink that."
>
> – City Official

"Long-term planning [is one thing CWS does well]. They have done pretty significant infrastructure work in terms of connecting our county with the Willamette River, our water resource. There has been a lot of growth happening in that county, and a lot of it has to do with long-term planning."

– Nonprofit and Community Partner



Research, Innovation, & Resource Recovery > Research & Innovation

Stakeholders recognized that CWS plays an essential role in Washington County, innovatively combining nature and science. The COVID-19 waste-water testing is great, practical evidence of that intersection, showcasing how protecting the river's health and vitality contributes to ensuring the region's public health and economic success.

"CWS plays a big role because it's important to have clean water, and they work hard to keep it that way, as well as thinking outside the box on how to do it in an innovative manner."

– Environmental Interest Group

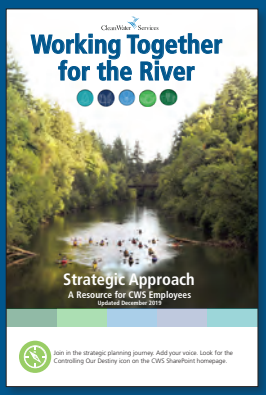
"CWS should continue to explore innovative ways to address the impacts of climate change while maintaining reliable and cost-effective service to customers."

– Business and Industry

"CWS was involved in testing for COVID; it was a unique and cutting edge thing out of them."

– Nonprofit and Community Partner

Findings > What's meeting good practices (cont.)



[Contributing to the Region's Environmental & Economic Vitality > Operating Performance]

CWS success at protecting the health of the Tualatin River and Communy Health

50%	35.7%	14.3%	0%
Very successful	Somewhat succesful	Not sure	Very unsuccessful

Most stakeholders acknowledge CWS as a high-quality institution that is nationally recognized for its work. They acknowledge how capable CWS is in aiming to protect the resident's public health and taking care of the environment at the same time. They acknowledge that CWS infrastructure is crucial to achieving public health benefits, improving the environment, and enhancing life quality. Furthermore, in addition to environmental and health benefits, wastewater treatment plays a crucial role in bringing economic benefits through their services and growing a strong economy.

> "They manage Fernhill wetlands, they've done exceptional outreach, they built some trails, and they've made it really a kind of destination facility. And with utility being this kind of hidden service, so to speak, I really don't know what more you could expect."
>
> – City Official

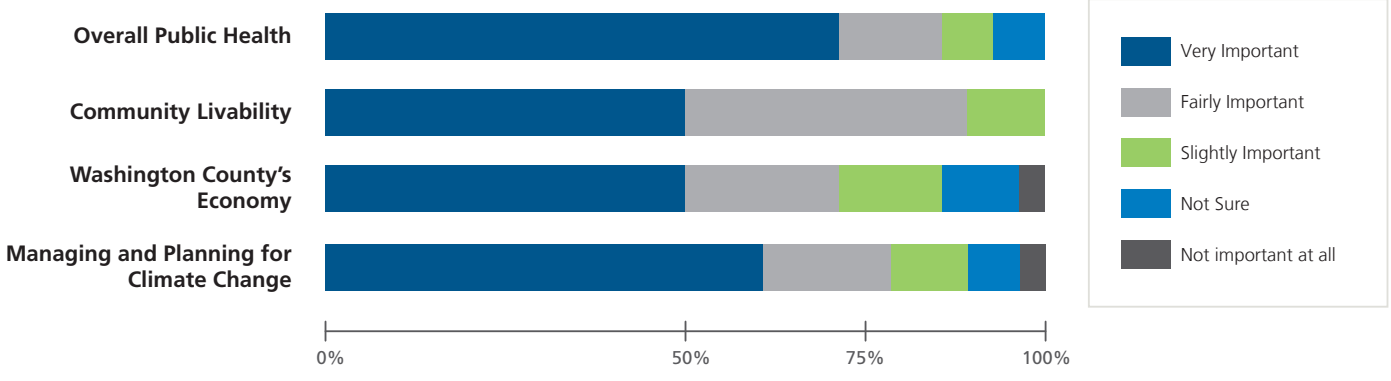
"I know they have been doing things for the EPA clean water act for DEQ, and they've given us a lot of options that have seemed to work well for our needs. And I appreciate the good water quality here, which is first and foremost what we want."

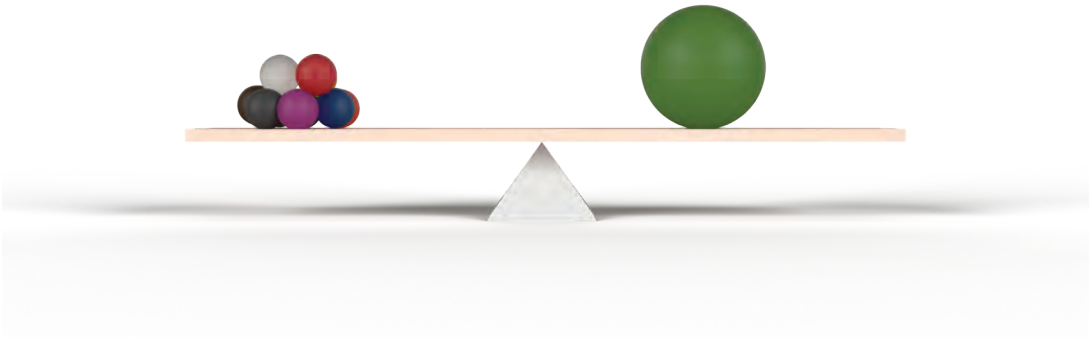
– City Official

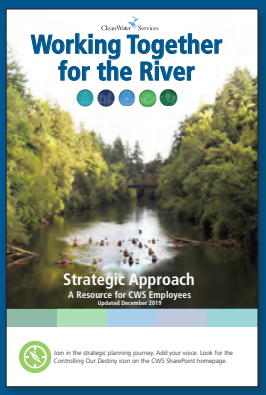
"[B]etween what they do and what the city does, they do high-quality work and don't really need to do anymore; their requirements don't need to be higher."

– City Official

Opinion about CWS's involvement with...







Catalyzing Transformational Partnerships > Strategic Partnership Impact

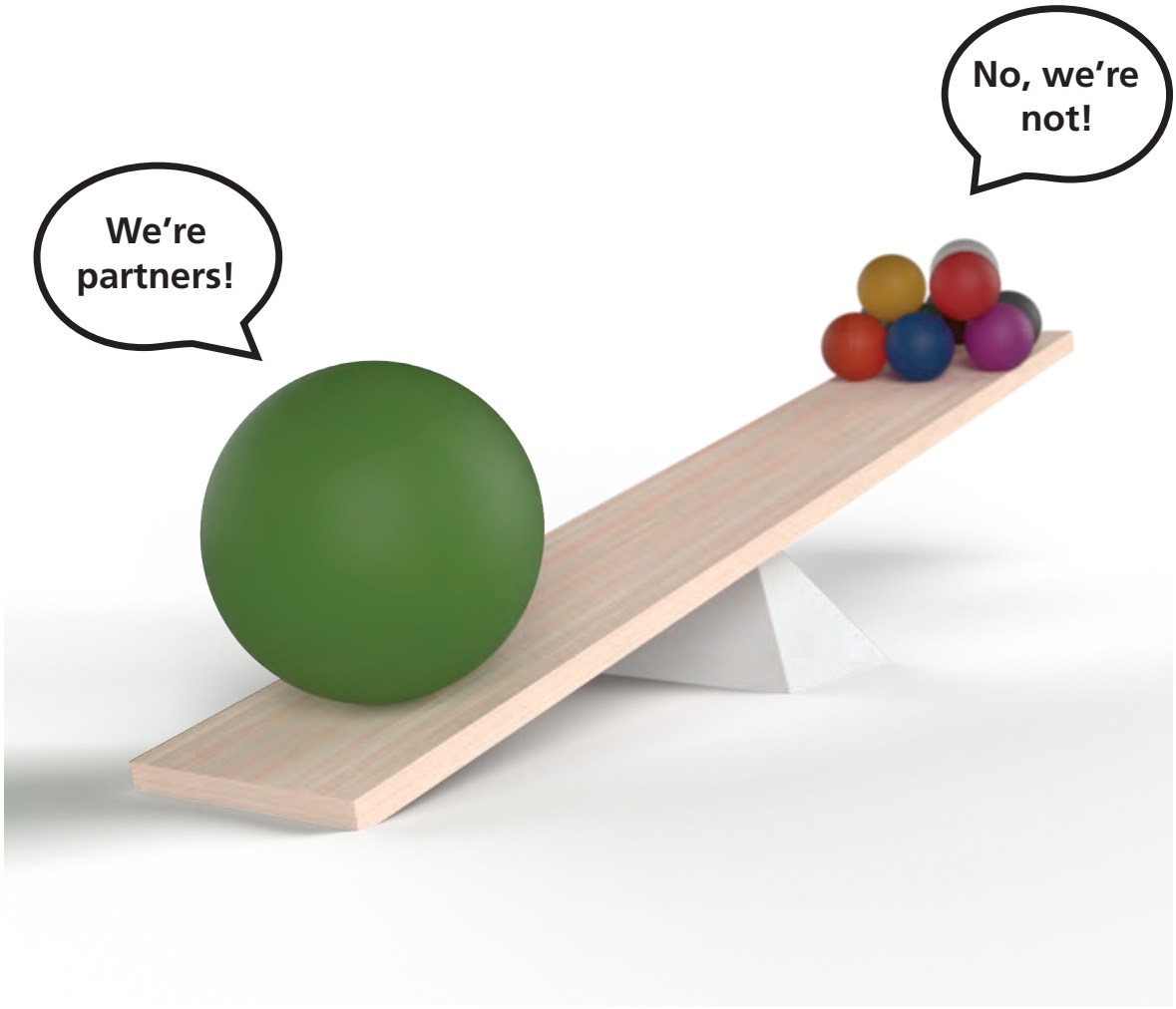
Key stakeholders have noticed the new leadership is more open for collaboration and opportunities for partnerships. They stated that Diane is more accessible for dialog. They also expressed optimism on working with CWS, creating this hope for more authentic partnerships.

> "Everything they do is in partnership with our cities and our water districts, we couldn't do it without them, and they couldn't do it without us. So, they should just continue to be good partners."
>
> – City Official

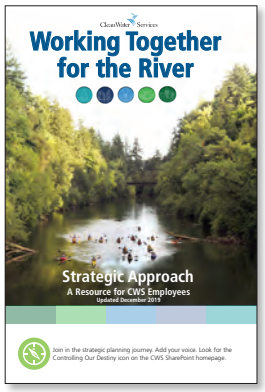
> "It is different today than it was, it's much more positive, and I think of them as partners as opposed to regulators."
>
> – City Official

> "In the last few years, they have done a much better job of acting like a partner.
>
> – City Official

What needs attention



Graphic adapted from the article "Power in Partnerships and When it Goes Bad" - What's the Pont [7]



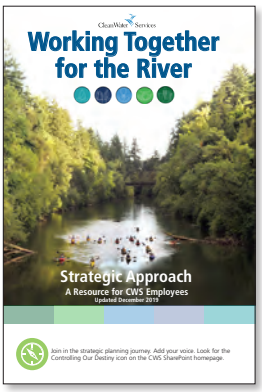
Findings > What needs attention

Organizational Excellence > Reputation Management

Some stakeholders mentioned that a cultural shift in the organization is needed. They recognized how vital and successful Diane's role has been in transforming the organization from having a "white supremacist" vision that influenced most of the processes, policies, and decisions, to a more inclusive and open one. Recognizing structural power and privilege in the context of the partnership dynamics will change how business is conducted, and devoting time and resources to build authentic partnerships will be essential for CWS and its stakeholders and the communities they represent.

> "But that is going to be difficult for them because their [CWS] culture is very much command and control and geared towards white supremacy, with a lot of their leadership being white males. There's a lot in the culture of CWS that makes the aspect of this work very difficult. So to transform the organization externally, they need to transform internally, and if they want to elevate people's voices, it has to be different. They have to work hard to change that and not just think that their way is always right, and it's going to be hard for CWS specifically because of the way that it's embedded in the organization. But I believe that if they want to, they can."
>
> – Environmental Interest Group

> "Sometimes I've considered them a bully, sometimes an innovator, and other times they try to be a good partner, so they aren't one thing but many."
>
> – City Official



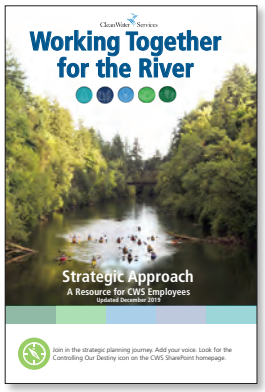
Integrated Water Resource Management & Resilient Watersheds > Regulatory Compliance

Many stakeholders want the permit processes to improve, stating that communication, turnover, and feedback clarity delay many projects. It is frustrating and complicated. Stakeholders would like more collaboration with cities. The stakeholders mentioned that CWS could improve it by communicating more transparently and providing updates throughout the application process. The regulations and higher rates are also perceived as a barrier to affordable housing.

The stakeholders stated that they would like to work with CWS and find solutions to remove unnecessary regulatory barriers and implement changes for planning and building department permits. Interviewees see these regulations as barriers to encourage functioning housing markets that are more responsive to the Washington County residents' needs. They see how crucial is CWS's role in supporting these efforts not just in its ongoing review to reduce regulation but in disseminating models, providing education and technical assistance to developers of all sizes. CWS must continue obtaining stakeholder input to reduce barriers, increase housing supply, and reduce costs and ways to increase housing supply across income levels.

Permits:

> "The city staff works very well with the staff from CWS; they respect each other and have a good working relationship. Politically, not so much. If it comes to the point where we've got someone who's going through a permit process and is struggling with CWS, they should be the face that is the front of that committee rather than my city staff. They're already getting beat up about city regulations; they don't need to be beaten up twice about CWS' regulations that they have nothing to do with."
>
> – City Official



Findings > What needs attention (Cont.)

Integrated Water Resource Management & Resilient Watersheds > Regulatory Compliance (Cont.)

> "There's some frustration; it might be an opportunity to sit down with our permitting and property folks to talk about the pain points. Because of the time it takes for CWS to review the permits and the subsequent review, it leads to greater expenses and unpredictability, and it's a painful experience for our team trying to get the project completed."
>
> – Business and Industry

> "We have struggled with timelines with CWS. We wait a while for their permitting process. Their delays have affected us with our timelines."
>
> – City Official

> "Jurisdiction, with lots of rules, requirements, and authority. You've got to please them."
>
> – Business and Industry

Although it is a fact that CWS received federal assistance and was able to help low-income families with their sewage bills during the COVID-19 crisis, this pandemic has emphasized how difficult it is for low-income households to make their utility bills. Stakeholders stated that utility bills are a significant portion of the average household's monthly budget. They shared their concern because the rates are the same for all citizens, so lower-income households' utility costs account for a larger share of their incomes than higher-income households.

Some of the interviewees suggest working with CWS to find options for this situation. "Electric and water bills combined account for an average 3.1 percent of the average US household's net income. They account for an average of 20.6 percent of net income among households in the lowest income decile," according to a Consumer Expenditure survey.

Rates:

"We don't hear from them... and our city absorbs a lot of negativity because we co-locate them on the water bill. So, we do a ton of explaining to our community what CWS is, and it would be more attractive to me if they took some of that ownership because when we raise water rates, even a bit of people freak[s] out. But it's not really the cost of the water; it's the cost of the disposal of it. So that, I think, is what is hard for people to get their minds around. I just think there is a lot more opportunity for us to work together on that messaging. That would be the most important thing—more frequent check-ins on what they're doing and how they're operating."

– City Official

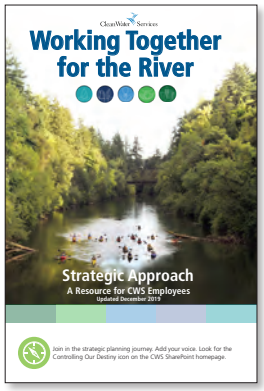
"One thing to be careful of is not raising their rates so much or too high because the biggest part of the utility bill is CWS; it's more than everything else combined. I would say they need to slow down on increasing rates because, as elected officials, people come to us saying that the bill for CWS is too high."

– City Official

City stakeholders stated that they have to play a forward-facing role for CWS to the public. It is difficult to do without full knowledge of the process and technical training about the permit process. They want to serve their constituents, and at the same time, they would like to partner authentically with CWS to work together and find a better-streamlined process.

"I routinely hear from folks who are going through our permitting process for a new building or change in development. They are frustrated with Clean Water Services and the fees associated with it. We know they have their mission, and what happens routinely, in my opinion, is that CWS has their standards, their fees, their process, but we're the ones that are put on the line to enforce it for them. So the city has to be the bad guy, and the city is the one who gets the bad rap. And it gets kind of frustrating that we have to take that, and they don't. They could do a better job of publicity and customer management."

– City Official



Findings > What needs attention (Cont.)

Catalyzing Transformational Partnership > Relationships with External Constituents

Many stakeholders have several issues that are concerning, especially about communication, transparency, and processing permits. Cities and developers would like more frequent communication from CWS to stay informed and to avoid confusion. Some stakeholders would like CWS to recognize and address their concerns and provide an opportunity for an open line of communication. Some ideas mentioned were CWS to visit city councils more frequently, provide ongoing education and training opportunities, and be more receptive to collaboration.

"We tend to only hear from them during crises, and the best way to have a relationship is not to talk only during a crisis situation."

– City Official

"They could work harder at listening, and feeling like their way is the only way. They have a lot of smart people, but sometimes they think they have the best idea, and that can limit their ability to listen to others. Or to take into account the knowledge/perspective of other communities on water access and drinking water safety."

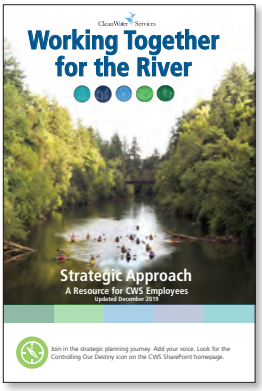
– Environmental Interest Group

"[T]here is a bit of a friction point because they won't play the bad guy to the community, only to us. They could be more active in the community discussions with the permit and the permit holders. We as the city are on the front line of that while CWS stays in the background, and I wish they were out there with us."

– City Official

"I didn't believe they were treating all our residents the same. So the city does a lot of work for CWS, but here are unincorporated parts of the county they manage themselves, and it always seemed as if they had higher demands on cities than they had on themselves."

– City Official



Manage Communications, Public Involvement, and Education Strategies

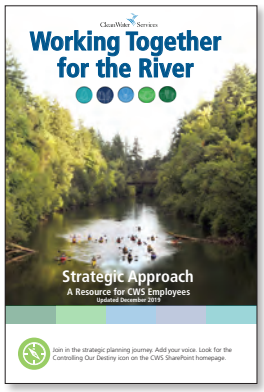
Although CWS provides thousands of dollars to local nonprofit organizations for community betterment, it was mentioned by only one interviewee. 20% of Stakeholders stated that the CWS rates are or could be a burden for low-income tenants, especially in and after COVID times. They also say that more education is needed about how the funds of CWS are being spent, stating CWS does good work that many are uninformed.

Participants recommend that CWS should communicate more effectively with Washington County residents and businesses. Many interviewees suggested utilizing simple, straightforward, and energetic messaging to engage the public. Specifically, using storytelling to develop a human connection increasing a sense of ownership of CWS's values, vision, and commitment. Several mentioned topics as stormwater, sewer protection, and river pollution are essential. Also, stakeholders commented that they would like to see more simple reports from CWS frequently to be aware of CWS's work.

Many stakeholders noted that more information and education on CWS's projects, practices, and efforts to protect the environment should be publicized and shared with the general public.

> "Everybody needs to know that there are a lot of moving parts to CWS' water utility programs. I think it will be an educational challenge, but we need to continue it. Because we have problems that take time and money to fix, they could easily be avoided if people were educated as to how the system worked."
>
> – City Official

> "They do a lot that most people don't know about in trying to keep close track of all the different metrics, like try to make sure the river is not too warm for the fish, full of bacteria for the people, [and has] too many nutrients like phosphorus or nitrogen for the overall ecosystem."
>
> – Environmental Interest Group



Findings > What needs attention (Cont.)

Manage Communications, Public Involvement, and Education Strategies

"I think they should be out there, showing what services they provide and how they do it. Most people don't realize how the water gets to their tap. And they have no idea what happens when they flush their toilet or when water goes down the sewer grate. And that is what CWS does, and people don't know about it."

– City Official

"I don't think the community knows about CWS at all. The cities are the face of the whole function. I think they understand the sewer concept of a sewer, but most would be hard-pressed to even identify that CWS was the agency that ultimately treated their sewer. So when utility rates are raised, they come to us, and we point out that the most expensive fees on the bill are not things we get money for, nor do we control the rate, so that can be very frustrating. I didn't know what stormwater meant until recently. I didn't know of the processes water takes with stormwater. Most people understand the sewer, but not stormwater. A lot of people call the bill a water bill, but it's a utility bill. We point out the most expensive fees are fees outside of city control, and the city doesn't receive those fees directly."

– City Official

"Be conscious of your outreach, and keep telling your story. It's very complex and very interesting. It's a unique agency, but they play a big hand in so much of what we do here with wastewater going into the systems, the charges when something new is built, and more."

– City Official

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Appendix 1

Stakeholders who participated:

Andy Varner, City Manager, North Plains

Bienestar Oregon, Housing Department, Hillsboro

Bobby Nuvolini, District Manager 2, Tualatin Valley Irrigation District

Deanna Palm, President, Hillsboro Chamber of Commerce

Frank Bubenik, Mayor, Tualatin

Intel Corp, Cross-Functional Team, Hillsboro

Jan Wilson, Executive Director, Tualatin River Keepers

Jason Snider, Mayor, Tigard

Jeffery Dalin, Mayor, Cornelius

Jerry Ward, Chair, Washington County Soil & Water Conservation District

Jesse VanderZanden, City Manager, Forest Grove

Joe Liebezeit, Avian Conservation Program Director, Portland Audubon

Keith Mays, Mayor, Sherwood

Kemp Shuey, Executive Director, Community Action - Hillsboro

Lacey Beaty, Mayor, Beaverton

Marc Farrar, Director of Government and Community Relations, Metro Land Group

Martha Bennett, City Manager, Lake Oswego

Michael Weston, City Manager, King City

Niki Munson, Land Acquisition Manager, Riverside Homes

Pete Truax, Mayor, Forest Grove

P.J. Stambaugh, Land Development Manager, Toll Brothers

Randy Ealy, Manager of Local Government Relations, Portland General Electric

Rob Drake, City Manager, Cornelius

Robby Hammond, City Manager, Hillsboro

Ryan Makinster, Director of Policy and Government Affairs, Home Builders Association of Metropolitan Portland

Scott McEwen, Executive Director, Tualatin River Watershed Council

Sherilyn Lombos, City Manager, Tualatin

Steve Callaway, Mayor, Hillsboro

Whitney Dorer, Interim Executive Director, Friends of Trees

Appendix 2

The Most Important Aspects of CWS that need to be communicated:

- *"[M]aybe something along the lines of we [CWS] want to work with you to make our waters the best and most abundant they can be. It's about [the] cleanliness of the water, the health of the water, but also [making sure] that the water is abundant, [that] it's not scarce. And those are all things that we have the ability to accomplish."*
- *"CWS partners with cities, they treat the water to a higher level than almost any agency in the United States. They do it very efficiently, and, despite the expensive fees you pay, they're well-spent."*
- *"I guess the most important thing if they were going to send a message to the community is that, you know, they're handling the wastewater and the stormwater and environmentally friendly, efficient way… I think just knowing that they provide that service, they do a good job, they're environmentally sensitive, and how they administer that service, all those things I think would be important to convey."*
- *"The community should know [about] their commitment to the community. I mean, that what drives them is similar to us. They're really a not-for-profit. The work they do is for the benefit of the community, and the commitment to the community is, I think, the most important thing in communities to understand what their operations are all about or not. You know, we all get our water bill and think we're paying the utility, and people are making money off of it, but that's not what it is. The proceeds that they get are enabling the community to thrive as a healthy community and go better. And that's the commitment that I think we've made and need to understand is real and ongoing and long-lasting."*
- *"[T]he health of our water, the health of our watershed and the care for it and treatment of wastewater."*
- *"[T]he important thing is that Clean Water Services does more than just remove the impurities out of the water. There's the whole thing of making sure the water is at the right temperature, making sure that all the restoration along the riverbank is there, making sure to help your habitat for fish and wildlife."*
- *"Clean Water Services gets dragged out on the carpet for all these erosion control and stormwater issues, but there's a lot of good stuff they do as well. They do huge mitigation sites, and they do these sanitary needs; they do all these environmental benefits. I think it's important that people understand the benefits Clean Water Services provides; having a regional provider is more effective, it's more efficient. [I]t also allows us as cities and Clean Water Services to [provide] better projects that have a greater good for a larger number of people. It's important for people to understand and know the benefits of having a regional provider give it to us."*
- *"[E]verybody needs to know that there is an incredible amount of machinery and a lot of moving parts to a program that ensures that every time you flush the toilet. A lot of things go into action to make sure that that water can be recycled. Clean Water Services has an educational challenge at that particular point because there are people that as soon as the toilet bowl empties, their problems are solved, but we need to continue that education. Specifically, I was thinking about the sanitary wipes that we've been using all across Washington county and battling the pandemic. Those aren't supposed to be*

flushed down there because they don't biodegrade. And so, if you put them into the system, somebody has to take them out. And that obviously is not a pleasant job. The public should know that, and the public should be aware that doing something that seems to be a minor thing; but if I do it and my neighbor does it, and then all of a sudden 15, 20, 30,000 people across the county of half-a-million started doing those kinds of things can bottleneck up a system that takes a lot of money to clean out, and that's money that can be used someplace else."

- *"[I]f I met someone at a party, and I just started talking to them about Clean Water Services, I guess I would just say they're responsible for keeping our streams and waterways and our water quality top-notch and pristine in Washington county. I mean, that's the most basic way to say it. If you're someone that wants to build a house or build a business, I would probably have a different answer. I would say, talk to them immediately. Talk to them first. Do you know what you're going to need going into this? I think that, hopefully, the two most important words in their title are "clean water," and it's just the "service" aspect that sometimes that can be frustrating. "Clean water," I think is there! It's the services and doing the outreach and being part of the connective tissue of what cities and the growth and development aspects that may have pressures to do, [people need to know] how those can all interact together most effectively."*
- *"[T]hey're not just a wastewater treatment plant; that they're not just a probating bureaucracy; to help pivot that narrative into, 'here's what we're doing to contribute to the advancement of society.' "*
- *"[E]very year, a finance director and I stand up in front of our city council and talk about utility rates, and the Clean Water Services component for both sewer and storm is a big part of our rates. We always take the heat for that. Nobody's in Clean Water Services comes down and talks about why they're doing what they're doing. If anything, it's that the community would want to know what their connection is to the river and to the watershed. That they're not just taking care of our sewer at the sewer treatment plants that it's, that they have a connection to the river, because our community really loves the river."*
- *"It's an agency many people don't know. We do the billing for Clean Water Services to collect storm and sewer fees. It's sort of a quiet agency yet. The Clean Water Services board of commissioners are the same Washington county commissioners who run the county government. Many people don't know that. So I would say considering Clean Water's mission, they should continue to tell their story more."*
- *"I don't think the community knows about Clean Water Services at all; some of that is because, at least in the urban cities, the cities are the front-facing part of the whole function. [They're] the ones that bill for it, or the ones that collect the money. [Cities] are the ones that get called when there's a problem. I don't think most of Washington County know what Clean Water Services does."*
- *"[T]he services they supply; why they're integral, why they're important. And when someone does get ticked off and question why their fees are so high, where those fees are going to. It's not the cost of delivery of their product if you will keep going up; it's a challenge because there are always new chemicals they have to process for. They have to get that message out on why they're important and why the costs of maintaining these systems keep going up because people just take it for granted."*

- *"They're their own separate utility and how important it is if you have a problem to go to the right people. A lot of times, because the city is billing for those services, I don't think they hear directly from the community enough. I think it goes through a filtered piece. And so how do we make sure that constituents have the right path to reach out to."*
- *"I think it's two things, from what I know, their efforts as community partners to protect and enhance the watershed, working with all parties[...] that they're convener. I think that's important to know, and I will admit it is self-serving for the community, being that we're part of this process. So for us, it's very important for them to be seen as conveners so that we're getting those opportunities to participate in these conversations. But also I think as their role with infrastructure, especially with clean water, the sewers, stormwater, and things along those lines, I think is very, very important to know for the community, because we have all these things in place. And it doesn't get ignored, but the public doesn't realize how it works, what it does, or how important it is because it's all just expected to be there. So just having the people be more conscious, moving forward, of their involvement and what they actually do."*
- *"[T]hey are responsible for ensuring a safe and reliable system to treat our wastewater."*
- *"[Their] watershed approach makes them unique. The fact that that Clean Water Services is responsible from the headwaters of the Tualatin to the mouth of the Tualatin and does it with competence and commitment to public health and commitment to the environment."*
- *"Clean water is going back to the Tualatin."*
- *"[CWS] regulate developers to ensure that they're complying with environmental laws."*
- *"[T]here are multiple goals that [CWS] have, including trying to have the best quality of water, but also having co-benefits including better habitat and wildlife as well as better resources for people to use green spaces."*
- *"[CWS is] working hard to build a dedicated staff and working hard to serve the community."*
- *"They're [CWS] responsible for keeping our streams and waterways and our water quality top-notch and pristine in Washington county."*
- *"[T]hey [CWS] are providing a central resource for our community. They should be able to make the connection between CWS and a clean/ healthy water system."*

Appendix 3

Messages to the CEO

- *"Be mindful of low-income communities and the dynamic between them and the services you provide. Because as logical as it seems to use normal means like fees and cutting services, they often can't afford these services, so fees and penalties put more burden on them. They, too, need the same level of service but don't often have the means to pay their "fair share" or for these services to be accessible."*
- *"Very specific to us would be infrastructure needs and the cost implications of developments. We have 50,000 in the Metro Portland area. In Washington County, we're at a deficit, and we're going to be 150,000 down in the next 19 years on top of that. And so, and just by that nature, that means escalating prices. So that's one of the issues. Obviously, they have their responsibilities to the infrastructure of the watershed and things along those lines. What happens for us is that this is all hands on deck. Whether it's affordable housing or subsidized housing or other options, we are doing everything we can, along with anybody that's in the system that adds cost to our homes. And those are hard costs that will always be there, but that we as builders can't fix, politicians can't necessarily fix them. So I think until you get back closer to a point of equilibrium on our housing needs, I think that's always front and center. And It's a tough balancing act. They have to deal with it. I just think that from my viewpoint, I don't have to make those tough decisions, and I don't envy them, but they have to do with that."*
- *"Washington County is an extremely diverse county, both ethnically and culturally, and she has the opportunity to learn from those cultures and communities and become better as an organization by listening and learning."*
- *"The concerns and needs of their partners, because while they are good engineers and process people, they are generally not engaging with the business and families in the areas they serve, whereas the city does. The better they work with us to understand the concerns of businesses, cities, and residents, the more successful they will be."*
- *"X would be protecting the existing water supply, and they would like to see an increased water supply. And it is important to continue exploring additional storage and non-storage alternatives, as well, but more than anything else, protecting what we have."*
- *"I would thank her for being a good partner and say that it's important to look at their rates. What people pay as a percentage of their income is important for utilities, so as a kind of public provider, we need to be cognizant of the impacts of our rates on our residents. Especially in Forest Grove (they have the second-lowest median income), where your utility bills are gonna be a higher percentage of your overall income than if you are from a higher-income area. It's important to understand how the rates are charged, and that the efficiency of the service impacts those rates, and that impacts the families, who, for most, the most important impact CWS has is on their bill. That can't get lost in the discussion."*
- *"To improve treatment and conveyance infrastructure to meet increased demand while maintaining reasonable and stable rates for customers."*
- *"Just pay attention to some of the outlying rural areas, too, because we have some surface stormwater issues too that don't really get the attention that you like Forest Grove or Hillsboro would. Like there's a lot of former farmland or agricultural land that has been really saturated and irrigated over decades, and it hasn't really been taken*

care of. And since we're also expected to grow our boundaries to provide housing and industrial land, we want to weigh those problems before development occurs. As well as working with the civil engineers or city planners as much as possible to really have a streamlined and efficient development process is truly important. If nothing else, please pay attention to that."

- *"Climate changes, and how can we partner together?"*
- *"Listen to the development community and their concerns, their questions, and educate them better on what's involved with dealing with CWS, so they're not shocked and ticked off once they've tried to do development. So that CWS is seen as a partner and not a deterrent to development."*
- *"It would be the SDCs thing. We need to do everything we can to make building housing less expensive, and having to finance SDCs at the time a permit is issued is absurd. So for CWS, as the SDCs that are collected on behalf of CWS, I would encourage Diane to be pushing the county and all other SDCs too."*
- *"I would say pay attention to providing adequate capacity for the growing needs of our county. We're a growing county, and we need to make sure that the water service companies grow to meet the growing needs of both the business and residential communities in our area."*
- *"Climate resilience is the number one thing I hope that they are paying attention towards. If we have learned nothing else from the weather events of the last three years, we know that all of our systems and structures are designed for a weather pattern that doesn't exist anymore and won't exist in the future. And so folks like those who run water and wastewater utilities are going to need to think about, um, flooding, fire, changing, um, habitats for our wetlands and streams. I just, I think, try to anticipate how the infrastructure needs to change and not just the hard infrastructure, like the pipes and the plants, but also the natural infrastructure, like the wetlands and the stream corridors and what we, how we plant around the stream corridors. Because what were once rare events might become more common and if our systems aren't designed for that (those weather patterns) our ability to deliver the service for the public who needs us is at risk."*
- *"I would say that the biggest thing to focus on is planning for the growth that's coming. There is a lot of growth coming to Washington county; between us, Hillsboro and Wilsonville, we've brought in about 2,500 acres. So planning for growth and accommodating that growth is probably at the top level. And if along the way, we could handle some of the erosion issues, that would be great."*
- *"Let's make sure that when Washington county and its cities grow, and when those people move into those cities, they move into a clean and efficient environment; one that has a system that takes wastewater and sends it back, almost trying to put it back the way it found it."*
- *"I think x would be feedback from the stakeholders on the CWS permitting bureaucracy. I think she would know how to navigate that best."*
- *"Be conscious of your outreach, and keep telling your story. It's very complex and very interesting. It's a unique agency, but they play a big hand in so much of what we do here with wastewater going into the systems, the charges when something new is built, and more."*

- *"Continue to streamline their processes so that they can improve their relationships with cities, especially with permitting processes."*
- *"I know that she knows what she needs to do, so from my point of view, and I know I've said this, and it sounds petty and unstrategic, but I would like you with us, please be the bad guy sometimes. I would like her to pay attention to helping her staff and be more in the front as opposed to in the back when it comes to permit licensing."*
- *"First, I would tell her great job, and then I would tell her to watch the budget; because as the budget grows, she has to raise rates in order to keep that budget and all those programs in place. So I would say keep a modest and conservative budget and do as much as you can with what you have. Because people can use less water, but that doesn't really change the bottom line on the water services bill. But if you go to a tiered scale, then don't raise rates on other people because that could put the squeeze on others, so overall, just don't keep raising the rates."*
- *"It is kind of a tear for me between the compliance and the cost. We absolutely have to make compliance, I suppose that's above the cost, but I think that's part of the consciousness. So we have to discuss what is the process and what does the compliance cost to maintain?"*
- *"The timeliness of their review and communication during that review process of applications for site development permits."*
- *"If I could say one thing, I would say that, in a couple of years, you make sure you maintain your core goals of water quality and enhancing habitat, but also responding to the needs of the community and to climate change."*
- *"I don't have anything in particular. Just continuing our partnership with SCWD for the mutual benefit of CWS and the residents of our county. That's what we've done so far, and I'd like to keep that relationship going forward."*
- *"I'm glad they hired you [LMS] to go out and to elected officials and get our feedback. They always work well with us; it's just the permit and adjusting education. And then when we do have issues, it doesn't have to be the head evilest thing, we can sit down with CWS, and they can explain why to those developers who are very frustrated. It's important to show people that it is not fancy offices and pay, that it's the actual cost of delivery and keeping up with the demands. And a big part of that is the publicity, quarterly reports, annual report cards, and signs/posters. So that people can see that their money is being used wisely and see that something is getting done with their money for the betterment of the community. And when their projects go south, it impacts [us]."*
- *"She also needs to keep holding my feet to the fire about doing something for the memory of Gale Ackerman at Fernhill."*
- *"One of the things I brought up to the mayors of Washington county is about late fees. We've discontinued them because we understood, through analysis and study, that they were significantly detrimental, especially to our DEI population, to have them at the library. Right. So now I've opened the conversation and the council's talking about, well, as we come back to the world of shut-offs and late fees, are those really equitable? Do we really continue to have late fees? Or are we just adding injury or insult to injury? I mean, if these folks are struggling so hard that they have to decide whether they're going*

to pay their late fee and pay their water bill this month, or if they're going to pay their power bill or their gas bill or buy food or medicine, are we really, is there a real cost to this and are we being equitable and appropriate or are we just hurting the people that are already the most challenged?"

- *"Working with CWS is a collaborative joint venture, and the more we can collaborate, the more we can work together on all the different items; like infrastructure services, and to purchase, acquire, and get as many uses for those right ways as we can; the more beneficial we can be as a whole. We need to stop looking at these issues as individual agencies and to look at them more as a group because while the diversification of services is good in some areas, so is the unification of those services. Especially if we can combine our efforts for things like active transportation, it would be better for all the agencies involved as well as the public."*
- *"Hello to Diane, Mark, and Joe from Randy."*

Appendix 4

Discussion Questionnaire

1. What is the first thing that comes to mind when you think of Clean Water Services?
2. What are one or two things CWS has done well in the last few years?
    i. What do you feel made those things successful?
3. Are there things they could have done better? Or opportunities they missed?
4. What are the important measures CWS should use to understand its positive impact on protecting the local environment?
5. CWS says they are committed to community health and protecting the health of the Tualatin River. How would you describe their success?
    i. Very Successful
    ii. Somewhat Successful
    iii. Not sure if they were Successful
    iv. Very Unsuccessful
        - Why do you assess them that way? What comes to mind when you say that?
6. How would you describe the quality of your relationship between CWS and your city/company/community?
    i. How could this interaction be improved?
7. Thinking about that, what role do you think CWS should play in the community?
8. As the water resource management utility for urban Washington County, CWS operates the region's four wastewater treatment facilities, manages stormwater, restores wetland and streamside habitat, and more to protect public health and the environment in the Tualatin Valley. I'm going to introduce a list of topics that CWS finds important to address, and we want to know what you think about CWS's involvement with:
    i. Overall public health?
        - Not Important at all
        - Slightly Important
        - Fairly Important
        - Very Important
            - Why do you assess them that way?
    ii. Community livability?
        - Not Important at all
        - Slightly Important

- Fairly Important
- Very Important
  - Why do you assess them that way?

iii. Washington County's economy?

- Not Important at all
- Slightly Important
- Fairly Important
- Very Important
  - Why do you assess them that way?

iv. Managing and planning for climate change?

- Not Important at all
- Slightly Important
- Fairly Important
- Very Important
  - Why do you assess them that way?

9. What's the most important aspect about CWS that the community should know?
10. If you are in a room with Diane Taniguchi-Dennis, Chief Executive Officer of CWS, and say, "Diane, if you do nothing else, pay attention to X In the coming years." What would you tell her? What would be the X?

Appendix 5

Survey Questions from CWS Discussion Guide

Clean Water Service is a water resource management utility that combines science and nature to clean water and return it to the Tualatin River to use again. CWS works with many partners to safeguard the river's health and vitality to ensure the region's economic success and protect public health for over 600,00 residents and businesses in urban Washington County.

1. What overall job performance rating would you give to Clean Water Services?
    a. Very good
    b. Good
    c. Average
    d. Poor
    e. Very poor
    f. I don't know
        i. Why do you assess them that way? What comes to mind when answering?
2. How urgently do you rank the following priorities? (1 - Low, 2 - Medium, 3 - High, 4 - Urgent)
    a. Creating processes to manage water resources more effectively and affordably

        1 2 3 4

    b. Developing water supplies to ensure adequate flow in the Tualatin River to protect water quality, fish habitat, and control treatment plant costs

        1 2 3 4

    c. Protecting and restoring the health of the Tualatin River and its tributaries

        1 2 3 4

    d. Having enough financial capacity to replace or construct the appropriate infrastructure

        1 2 3 4

    e. Supporting and/or creating economic growth opportunities for the community interested in environmental change

        1 2 3 4

f. Effectively utilizing natural systems and green infrastructure to manage water resources

1 2 3 4

g. Planning for the effects of climate change

1 2 3 4

3. How believable do you find the following statement that addresses CWS positioning?

"At CWS, we spend a lot of time protecting the river so we can ensure we have clean water again and again and again."

a. Extremely Believable

b. Somewhat Believable

c. Not Sure

d. Somewhat Unbelievable

e. Unbelievable

i. Please explain your reasoning

4. The following are the five core services; how would you rate their performance? Please rate from 1-5 (1 being very poor and 5 being excellent)

a. Wastewater Collection and Treatment

1 2 3 4 5

b. Restoring Wetland and Streamside Habitat

1 2 3 4 5

c. Environmental Protection of Watersheds and Water Quality

1 2 3 4 5

d. Surface and Stormwater Management

1 2 3 4 5

e. Permitting Services, including environmental reviews, site development, and inspections for homebuilding and business development

1 2 3 4 5

5. CWS says they are committed to community health and protecting the health of the Tualatin River. How would you describe their success? Explain your answer:
    a. Very Successful
    b. Somewhat Successful
    c. Not sure if they were Successful
    d. Somewhat Unsuccessful
    e. Very Unsuccessful
        i. What comes to mind when answering?
6. How is your relationship with CWS?
    a. Very good
    b. Good
    c. Average
    d. Poor
    e. Very poor
    f. I don't know
        i. What comes to mind when answering?
7. As you know, CWS treats wastewater, manages stormwater, and helps to protect the Tualatin River throughout Washington County. How important are these activities to:
    a. Overall public health?
        i. Not Important at all
        ii. Less Important
        iii. Not sure
        iv. Fairly Important
        v. Very Important
    b. Community livability?
        i. Not Important at all
        ii. Less Important

iii. Not Sure

iv. Fairly Important

v. Very Important

c. Washington County's economy?

i. Not Important at all

ii. Less Important

iii. Not sure

iv. Fairly Important

v. Very Important

d. Helping mitigate climate change?

i. Not Important at all

ii. Less Important

iii. Not sure

iv. Fairly Important

v. Very Important

8. Thinking about how people and businesses use water in Washington County, how important are the following activities for the overall vitality of your community?

a. Cleaning and reusing the water we have

i. Not Important at all

ii. Less Important

iii. Not sure

iv. Fairly Important

v. Very Important

b. Creating new supplies of water by expanding the reusing of water or improving the dam at Hagg Lake

i. Not Important at all

ii. Less Important

iii. Not sure

iv. Fairly Important

v. Very Important

c. Using more environmental-based practices (like planting trees and restoring wetlands) and fewer traditional engineering approaches to protect water quality and supply

i. Not Important at all

ii. Less Important

iii. Not sure

iv. Fairly Important

v. Very Important

d. Other

9. What challenges or problems related to water resources in Washington County concern you?

a. Balancing the competing demands from growth

b. Stormwater runoff from new development

c. Aging infrastructure

d. Budgetary constraints

e. Adapting to climate change

f. Educating the public

10. Do you feel you and your community have been adequately engaged by CWS?

a. Yes

b. No

i. IF YES: What's worked well?

ii. IF NO: What is missing? Or what could be better?

Tualatin Project/Scoggins Dam Update

- **Diane Taniguchi-Dennis,** Chief Executive Officer
- **Mark Jockers,** Chief of Staff
- **Tom VanderPlaat,** Water Supply Manager
- **Tracy Rainey,** Senior Policy Analyst
- **Shannon Huggins,** Public Involvement Coordinator

Protecting public safety and meeting the region's water needs are central to the Tualatin Joint Project (TJP). Clean Water Services and the other Tualatin Project repayment contractors (Tualatin Valley Irrigation District and the cities of Beaverton, Hillsboro and Forest Grove) have been working with the U.S. Bureau of Reclamation (Reclamation) toward these goals. CWS, the repayment contractors and Reclamation (collectively, the Project Partners) have been working for more than 16 years to make the necessary Scoggins Dam safety modifications to protect the basin's primary water supply against a major earthquake and also meet the long-term municipal, agricultural and environmental water needs of our region. Reclamation and CWS have been working together under Reclamation's Joint Project authority secured in the 2016 Consolidated Appropriations Act to consider design concepts. The dam safety modifications are an 85 percent federal/15 percent local cost share. Additional benefits secured under a Joint Project are the responsibility of local beneficiaries.

Over the past five years, the Project Partners have been working on three options:

Modify the existing dam: This option would secure the existing water supply. Reclamation is leading the planning and design for this option as part of its Safety of Dams Program. It's known as the Safety of Dams only or SOD-only project.

Modify and raise the existing dam: This option includes expanding the existing reservoir and is part of the TJP. Planning and design for this option are being funded by CWS and directed and executed by CWS and Reclamation.

Construct a new downstream dam: CWS is coordinating the engineering and environmental review of the proposed new

concrete dam downstream of Stimson Mill, which also includes additional storage.

2020 DESIGN OPTIONS NOT FINANCIALLY FEASIBLE

In February 2020, the Project Partners met to review feasibility designs for all three options, which have estimated costs ranging from $750 million for the dam safety modifications alone to $1.2 billion for the downstream option. While all three options were deemed technically feasible, due to the cost and complexity of the project, the options were not financially feasible and CWS and Reclamation did not select an option to move into detailed engineering design. Instead, CWS and Reclamation have been developing additional information about risks, costs and other water resource funding opportunities to bring the project to bear.

Meeting CWS compliance needs without new water

New modeling shows CWS could cost-effectively meet its thermal compliance needs without additional water by:

- Expanding water reuse.
- Increasing the riparian shading program (Tree for All program).
- Optimizing water releases from Hagg Lake and Barney Reservoir.
- Securing reserve water agreements and other strategies to meet instream needs.

WILLAMETTE WATER SUPPLY TO MEET DRINKING WATER NEEDS

Scoggins Dam/Hagg Lake has served as the region's primary drinking water supply since its completion in 1977 and remains a critical source for the cities of Hillsboro, Beaverton and Forest Grove. In 2026, the Willamette Water Supply Project will come online as an additional water supply for the Tualatin Valley Water District and the cities of Hillsboro and Beaverton to meet drinking water needs.

INTEGRATED WATER NEEDS OF THE REGION

With CWS' alternative compliance strategies, the Willamette Water Supply Project and sustainable agricultural supplies in place, our region has adequate water supplies for the current planning horizon. CWS' work with Reclamation on the downstream dam option and the

region's work with Congress to secure joint project authority provide the framework for the next generation of water resource development in the Tualatin Basin.

SCOGGINS DAM SEISMIC MODIFICATIONS — THE TIME IS NOW

The safety, security and reliability of Scoggins Dam is central to ensuring the drinking water, agricultural irrigation and instream flow needs of our region are met. As the 2020 feasibility design showed, the cost of expanding Hagg Lake is beyond the region's financial capacity and does not align with Reclamation's accelerated dam safety funding timeline should the infrastructure bill pass. The SOD-only project provides the most cost-effective and timely strategy to work with the federal government to protect public safety and secure the region's primary water supply.

INFRASTRUCTURE BILL WOULD ACCELERATE SCOGGINS SAFETY IMPROVEMENTS

The Senate's bipartisan infrastructure package includes an unprecedented infusion of funding for Reclamation's Safety of Dams program, providing $500 million over the next five years and annual program budgeting. Final action on the bill is anticipated in mid-December. This additional funding will accelerate the Safety of Dams program, including work on Scoggins Dam.

SUPPORTING THE SOD-ONLY PROJECT AND SECURING WATERSMART GRANT FUNDING

CWS and the repayment contractors are prepared to support Reclamation's SOD-only project and seek a federal WaterSMART grant. The federal WaterSMART grant will help our region optimize water management including addressing the impacts of climate change, drought, endangered species, source water and protecting watershed resilience. The WaterSMART program will also help identify other grant funding sources for water reuse and other investments benefiting the region.

The potential infusion of federal funding to Reclamation and the SOD program is a unique opportunity for our region to secure its primary water supply in the near term, while positioning the region to pursue additional investments to address longer-term water supply and water quality challenges.

DAY 3

Thursday, October 21, 9 a.m. to 12:30 p.m.
ripl (formerly the TTM building)

Learning Themes and Objectives

- ripl (Research+Innovation+Partners+Labs)
- Occupied Buildings Facility Planning
- Fernhill Natural Treatment System

9 a.m.	Welcome, introductions, overview of learning
9:15 a.m.	ripl (Research+Innovation+Partners+Labs)
10:15 a.m.	CWS facility planning
11 a.m.	Walk to Fernhill entrance
11:15 a.m.	Tour of Fernhill Natural Treatment System
12:15 p.m.	Adjourn (boxed lunches provided)

ripl

- **Nate Cullen,** Chief Operating Officer
- **Ken Williamson,** Research and Innovation Director
- **Blythe Layton,** Water Resources Program Manager
- **Marc Franck,** Building and Facilities Services Manager

Clean Water Services operates the Fernhill Natural Treatment System — the nationally-recognized treatment wetlands adjacent to its Forest Grove Water Resource Recovery Facility.

Inspired by nature and grounded by science, CWS identified Fernhill as the location for a research center to solve current and future water challenges. In 2019, CWS purchased a two-story, 62,500 square-foot office building for $2,266,000 from TTM Technologies North America, LLC. The building is on 3.73 acres next to CWS property and the Forest Grove facility.

Clean Water Services' ripl (Research+Innovation+Partners+Labs) currently houses a molecular biology laboratory, Field Operations construction staff, and storage for Building and Facilities Services. Included in the building purchase agreement, CWS leases office space to TTM through March 2023.

A full building renovation is underway to build laboratories; and create research, office and meeting space to support the development of innovative treatment technologies. Work is expected to begin in 2024 and should be completed by 2026.

CWS Facility Planning

- **Nate Cullen,** Chief Operating Officer
- **Perry Sunderland,** Principal Engineer

The next five-year Capital Improvement Project will include several occupied building projects in advance of constructing ripl. Guiding these will be an Occupied Building Master Plan that provides a roadmap for sequencing the projects in an orderly, rational manner, to redistribute the workforce across existing and new buildings. These projects support our reorganization by locating staff adjacent to like work groups to promote collaboration, with requisite support facilities for efficient workflow and performance.

Tour of Fernhill Natural Treatment System

- **Jared Kinnear,** Reuse Manager
- **Ely O'Connor,** Senior Public Affairs Specialist

Fernhill is part of more than 750 acres in Forest Grove owned by Clean Water Services for water resources management. Fernhill utilizes natural treatment systems, or wetlands, to improve water quality by removing nutrients, cooling, and naturalizing water after initial treatment at the Forest Grove Water Resource Recovery Facility. In the summer, five million gallons of water are cleaned each day at Forest Grove and then Fernhill before flowing to the Tualatin River.

In 2014, 90 acres of old sewage lagoons were transformed into treatment wetlands by draining the ponds, then drying and excavating more than 250,000 cubic yards of soil into precise contours and depths. Using 15 control structures and 2,400 feet of piping, the water was managed to encourage the growth and establishment of more than one million native wetland plants and four billion seeds, planted both for water quality and for habitat. Birds and wildlife have taken to the 180 logs and snags that were anchored into place, and human visitors are enjoying three miles of trails, outdoor gathering areas and wildlife watching.

Fernhill Natural Treatment System Milestones

2006: CWS acquires 187 acres, including Fernhill Wetlands.

2009: Portland Audubon designates Fernhill an Important Bird Area.

2012: Several acres of asphalt converted to wetlands for testing natural treatment systems. Water Garden built.

2014: South Wetlands construction coverts 90 acres of sewage lagoons into natural treatment systems.

2015: South Wetlands created with more than four billion seeds and 750,000 native plants.

2016: Volunteer program launches.

2017: Nutrient filter built, allowing cleaned water to travel through the wetlands year-round. Paseos Verdes Watershed Health Walks established.

2018: Parking lot improvements complete.

2019: Research projects launch (floating wetlands, denitrification wetlands).

2020: Visitor and volunteer stations constructed. Trails extended along Fernhill Lake.

2021: Dabblers Marsh trail and additional visitor parking complete.

AN OASIS IN THE MOST UNLIKELY PLACE

FERNHILL
Clean water, naturally

By Diane Taniguchi-Dennis, Clean Water Services

August 7, 2015

In providing clean water to more than half million customers in Oregon's Tualatin River Watershed, Clean Water Services, a water resources management utility, takes an approach that extends well beyond the silos of wastewater, stormwater, and permit requirements to consider the overall needs of the watershed. Their water solutions not only serve people, but the non-human constituents that comprise critical components of the region's ecology. In the process, they not only improve water quality, but connect people to the ecosystems that surround and support them, and provide new opportunities to enjoy nature. An example is Fernhill, a 700-acre property owned by Clean Water Services for the management of water resources. Located near the confluence of Gales Creek and the Tualatin River, Fernhill combines a state-of-the-art wastewater treatment facility with a mosaic of riparian wetlands, and a network of public walking trails and spaces. The wetlands, which naturally cool and provide an additional treatment to the water once it is disinfected, add habitat, ecological function, and recreational opportunities. Despite the fact that it is wastewater treatment site, Fernhill Wetlands is beloved by birdwatchers, hikers, and nature lovers. Fernhill Wetlands is an oasis–not only for migratory birds traveling the Pacific Flyway, but for people seeking to immerse themselves in nature and escape the noise and stress of urban life. Biohabitats worked with Clean Water Services to convert three former sewage lagoons into riparian wetlands, and we're delighted to share this guest blog post by Clean Water Services Deputy General Manager, Diane Taniguchi-Dennis.

The first word uttered by many visitors on tour to Fernhill for the first time is often a heartfelt "Wow!" This reaction is usually followed by a puzzled look when we explain that what they see before them is a natural wastewater treatment system at work. They are puzzled because what they see before them is a lovely, expansive wetland that does not look like a 'treatment' system.

The used water from our cities is first treated by a state-of-the-art treatment facility and the cleaned water is disinfected prior to entering into Fernhill Wetlands. Most people understand the purpose of a concrete and steel treatment facility. What they do not always realize is that the treated, sterilized water is actually warm, and has nutrients remaining, and that fish in the Tualatin River require cooler water to survive and flourish.

Fernhill is an "ecological bridge" because it lets nature interact with the treated water before it is released back to the Tualatin River. The wetlands naturally cool the water and cycle the nutrients and other constituents. Fernhill water interacts with the complex organisms in the soil and aquatic plants that are powered by the sun.

Nature is also making Fernhill its own space. At full operation, Fernhill will release this naturalized water, along with seeds from native plant species, to the river. Fernhill transforms traditional wastewater treatment into becoming a new, vibrant heartbeat that seeds the river basin with the native plants as it pulses with naturalized water.

Everything on the Earth cycles between the land, air, water, and through all life–plants, bugs, bunnies, bees, and ultimately within ourselves. Fernhill Wetlands put the urban water cycle into human context through direct experience to create the understanding that what we put down the drain in our urban area matters to people and to nature. The investments we make as a community in our public infrastructure matter.

And it's not just about healthy water. It's about healthy and mindful living.

As we leave our cars in the Fernhill parking lot and begin to walk on the path toward the water garden, our sense of hearing is drawn away from the sounds of a busy city to the peaceful song of birds.

With the crunch of gravel in every step we take, and with each exhale, the stress of the day begins to release itself. Our sense of space and feelings of crowdedness expands at Fernhill in a view framed by a sky blue horizon, mountains, wetlands, and trees. Our attention is distracted from urban life by watching the elegant stillness of blue herons in repose patiently hunting for a fish, or by the bald eagle swooping from great heights to catch its prey invisible to our eyes, or the coordinated lift of hundreds of honking geese from Fernhill Lake, or the dancing flight of a busy dragonfly.

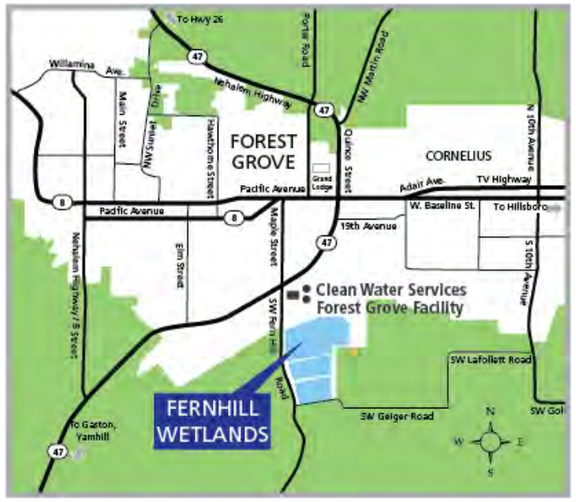
Fernhill is significant because it quietly speaks to the hearts of people who visit and are delighted to find a space for solace and renewal with nature close to home. Fernhill is a significant outdoor learning space for the children who visit–whether it is to conduct science experiments, create their growing personal list of birds to find and watch, or see the comedic antics of a sandpiper chirping, skipping, and pretending to have a broken wing all the while leading them away from her nest. Fernhill Wetlands is a place of wonder for children, and that wonder comes in many forms, from finding the croaking frog hidden in the wetland, to watching the family of ducks with tiny ducklings swimming all in a row, to discovering fascinating rocks and jingling them their tiny pockets as they walk toward a bridge and anticipate throwing them into the sparkling water.

My peers who visit Fernhill often leave with a renewed sense of purpose for their work in the water industry and the environment. The heart connection they make with nature often inspires them to look for opportunities to create a Fernhill of their own. Fernhill not only makes environmental sense, it is more cost effective than expanding the concrete and steel plant to treat nutrients and temperature, and it creates a space that the public can actively utilize for recreation, to exercise and to reduce stress as they connect with nature.

If you were to ask someone if they thought they'd feel renewed, relaxed, and inspired after visiting a wastewater treatment and water reuse facility, what do you think they would say? If you bring them to Fernhill Wetlands, they may very well say, "Wow."

Please visit fernhillnts.org for more information.

VISITING



OPEN DAWN TO DUSK
1399 SW Fern Hill Road
Forest Grove, OR 97116

The parking lot, trails, picnic shelter, and restroom (with a drinking fountain and potable water tap) are open to the public from dawn to dusk. The picnic shelter is available on a first-come, first-served basis. Reservations are not accepted. Picnic shelter and tables are ADA-accessible.

The main loop around Fernhill Lake is 1.1 miles. Trails are paved only near the parking lot, restroom and shelter. Please leave bikes in the racks, and be mindful not to disturb bird-watchers and photographers.

Even the best behaved dogs may be a threat to the birds and wildlife that nest, rest and feed at Fernhill. Please leave your pets at home.

fernhillnts.org | 503.681.3600

FERNHILL TIMELINE

2006
Clean Water Services acquires 187 acres, including Fernhill Wetlands

2008
First Fernhill Master Plan developed by Clean Water Services

2009
Portland Audubon designates Fernhill as an Important Bird Area

2012
Several acres of asphalt are converted to wetlands for testing natural treatment systems

The Water Garden is built, providing respite to people and habitat for waterfowl, also plays a role in the natural treatment systems

First Birds & Brew event is hosted by the Fernhill Wetlands Council

2014
Construction of the South Wetlands converts 90 acres of sewage lagoons into natural treatment systems

2015
South Wetlands created, including more than three billion seeds and 750,000 native plants

2016
Volunteer Stewards Program launches

2017
Nutrient Filter built, allowing cleaned water to travel through the wetlands year round

Paseos Verdes Watershed Health Walks established in partnership with Bienestar

For the 15th year in a row, the Forest Grove treatment facility earns a Platinum Peak Performance Award from the National Association of Clean Water Agencies

2018
Parking lot improvements complete

2019
Research projects launch (floating wetlands, Denitrification wetlands)

2020
Visitor and volunteer buildings constructed, trails extended along Fernhill lake

WHAT'S NEXT?
Visitor amenities, research projects, education opportunities and more!

Clean Water Services

FERNHILL
Clean water, naturally

FOREST GROVE OREGON
A place where businesses and families thrive

FERNHILL
Clean water, naturally

"Together we are creating a legacy for our communities and region."
- Diane Taniguchi-Dennis, CEO, Clean Water Services

WHAT IS FERNHILL?

Fernhill is part of more than 700 acres in Forest Grove owned by Clean Water Services for water resources management. Fernhill utilizes natural treatment systems, or wetlands, to improve water quality by removing nutrients, cooling, and naturalizing the water after initial treatment at the Forest Grove facility. In the summer, five million gallons of water are cleaned each day at Forest Grove and then Fernhill before flowing to the Tualatin River.

In 2014, 90 acres of old sewage lagoons were transformed into treatment wetlands by draining the ponds, then drying and excavating more than 200,000 cubic yards of soil into precise contours and depths. Using 15 control structures and 2,400 feet of piping, the water was managed to encourage the growth and establishment of more than one million native wetland plants and four billion seeds, planted both for water quality and for habitat. Birds and wildlife have taken to the 180 logs and snags that were anchored into place, and human visitors are enjoying the 1.1 mile loop around Fernhill Lake, trail improvements, outdoor meeting areas and wildlife watching.

DESIGN AND PLANNING

For the past several years, Clean Water Services staff and consultants have worked extensively on the design and construction of the natural treatment wetlands at Fernhill. The Natural Treatment System (NTS) has been designed with precise depths, slopes and channels in order to guide water through wetland plants and soil to further cleanse, cool and naturalize water before it's returned to the Tualatin River.

OPTIMIZING PROJECT COSTS

Wastewater treatment during the summer at Forest Grove is not possible without modifications to the treatment facility. Instead of investing in concrete and steel infrastructure at Clean Water Services' Rock Creek Facility to treat these flows, the NTS at Fernhill was developed to provide an "ecosystem process" that adds capacity to conventional treatment systems. The NTS acts as a bridge from conventional wastewater treatment to river discharge. The project meets all federal and state permit requirements. Offset project costs for treating the water naturally is roughly $13 million.

TREATMENT

CONVENTIONAL WASTEWATER TREATMENT

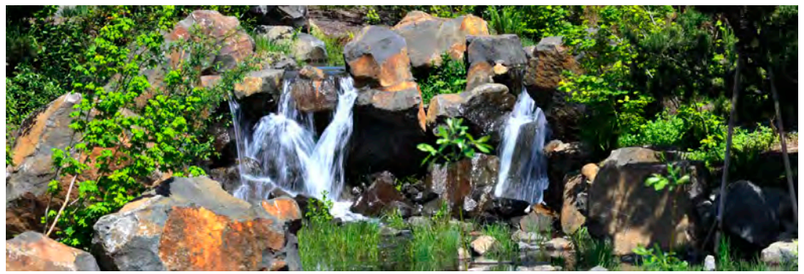
On an average summer day, five million gallons of used water from homes and businesses in Forest Grove, Cornelius, Gaston and parts of Hillsboro are treated at the Forest Grove Wastewater Treatment Facility. The conventional treatment process takes about 24 hours.

NATURAL TREATMENT STYSTEM

The Natural Treatment System (NTS) creates an ecological bridge between the treatment facility and the river, where water is cleansed further, cooled and naturalized before its return to the river.

THE WATER GARDEN

For a natural treatment system to function, oxygen must mix into the water. At Fernhill, freshly aerated water tumbles to Fernhill Lake through a water garden of artfully placed boulders, pine trees and graceful arched bridges.



Hoichi Kurisu, an international landscape architect acclaimed for creating healing gardens, designed the water features, arched bridges and garden areas for beauty and solace. To achieve the desired impact, he selected 1,500 tons of boulders from a local quarry to complement 30-year-old contorted pines that he had grown. These were precisely positioned. Two bridges, constructed of Douglas fir, complete the effect.

"In our busy, stressful lives, a restorative garden offers glimpses of a butterfly, a tree, a waterfall as a way to reconnect to our nature."

- Hoichi Kurisu, Landscape Architect

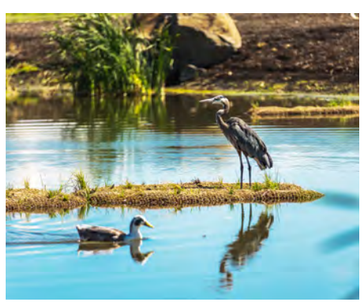
PLANTS AND WILDLIFE

Fernhill is a great place to see the connections between water, plants, birds and wildlife. The diversity of native plants at Fernhill provides long-lasting benefits for aquatic invertebrates, pollinators, amphibians and reptiles, waterbirds, songbirds and raptors, and mammals.

BIRDS

Fernhill is an important stopover area for wintering waterfowl and migrating birds traveling the Pacific Flyway. Designated as an Important Bird Area by the Portland Audubon Fernhill is widely known as a premier bird-watching and photography destination in Oregon. Depending on the season, visitors may see a variety of waterfowl species, flocks of migrating songbirds, herons and egrets, bald eagles nesting in the trees, or shorebirds foraging on the mudflats.

NATURAL TREATMENT SYSTEMS & HABITAT



One of the benefits of transforming Fernhill from sewage ponds into natural treatment systems is increased habitat for birds and wildlife. The addition of native wetland plants, logs and snags has the added advantage of providing critical habitat for a variety of bird species, from secretive marsh birds such as Sora and Virginia Rail, to wetland and riparian songbirds including Common Yellowthroat, Marsh Wren, and Red-winged Blackbird, as well as a variety of wintering waterfowl. The greater Fernhill site also supports a variety of raptors, including Bald Eagle, Peregrine Falcon, and the occasional Northern Harrier.

In the spring of 2015, CWS began working with the Portland Audubon to understand how the birds are responding to the creation of the NTS at Fernhill. Utilizing a unique cadre of expert birders, Audubon has been coordinating a community science effort to collect data on bird diversity and abundance within the NTS portion of the Fernhill site. Surveyors record the birds they see or hear and record data in an eBird Hotspot created for this effort. Surveys will continue in 2018-19. A final report is expected in December of 2019.