Metropolitan Water Reclamation District of Greater Chicago

Welcome to the April Edition of the 2022 M&R Seminar Series

NOTES FOR SEMINAR ATTENDEES

- All attendees' audio lines have been muted to minimize background noise.
- A question and answer session will follow the presentation.
- Please use the "Chat" feature to ask a question via text to "All Panelists."
- The presentation slides will be posted on the MWRD website after the seminar.
- This seminar has been approved by the ISPE for one PDH and pending approval by the IEPA for one TCH. Certificates will only be issued to participants who attend the entire presentation.

RAJEEV KAPUR
WATER RESOURCES PROGRAM MANAGER
CLEAN WATER SERVICES

Rajeev Kapur works for Clean Water Services as a water resources program manager. His role includes overseeing the implementation of Clean Water Services' watershed-based NPDES permit, water quality monitoring program, and water quality trading program. Prior to joining Clean Water Services, Raj worked for CH2M HILL and Oregon Department of Environmental Quality. Raj has a bachelor of science in Petroleum Engineering from Penn State University and a master of science in Environmental Engineering from Portland State University.

Use of Integrated Planning to Facilitate an NPDES Permit Renewal

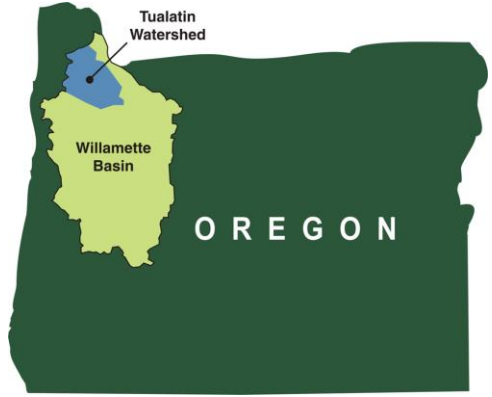
Raj Kapur, Jody Newcomer, Ken Williamson, & Bob Baumgartner/Clean Water Services
Tom Dupuis & Jeff Semigran/HDR

Clean Water Services

Topics

- Tualatin River Watershed
- Clean Water Services
- EPA Framework for Integrated Planning
- Integrated Plan: CWS approach
- Plan Elements
- Strategies
- Outreach efforts
- Next Steps

Tualatin River Watershed



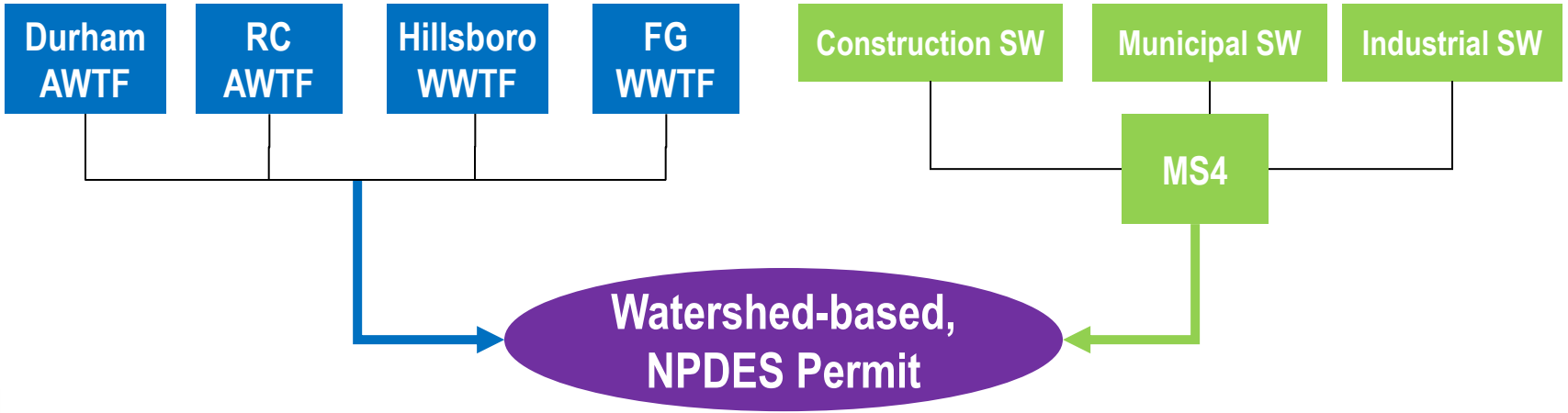
Lower Tualatin River

Clean Water Services

- Special service district
- Service population: ~620,000
- Operate 4 WWTFs
- Municipal stormwater program (MS4) in urban Wash. Co.
- Watershed enhancement activities
- Implement programs cooperatively
  - 12 member cities
  - Washington County

Watershed-based NPDES Permit

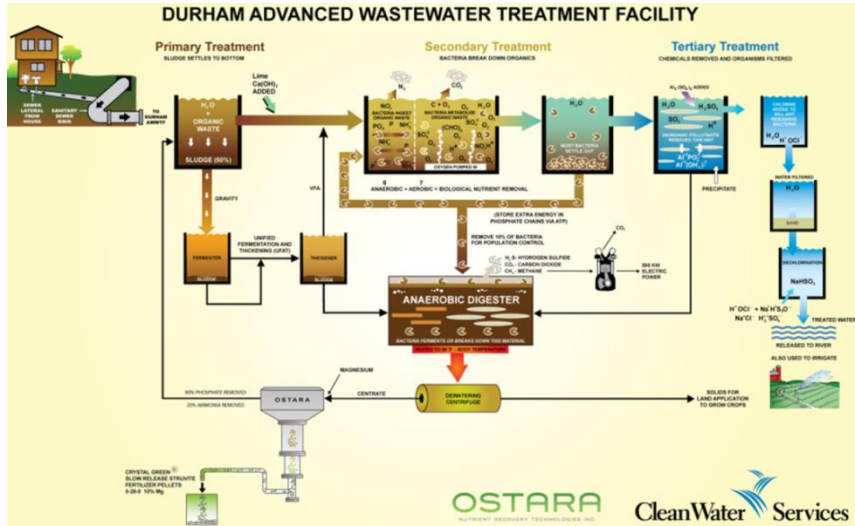
- Integrated permits for 4 WWTFs, and municipal stormwater program
- Includes water quality trading for temperature
- Bubbled loads for TSS and phosphorus



Wastewater Collection & Treatment

Rock Creek and Durham AWTFs

- RC: 46.4 mgd; DM: 25.7 mgd
- Tertiary treatment facilities
- Resource recovery
- Effluent Limits (dry season)
  - CBOD/TSS: <5 mg/L
  - Ammonia: 0.5 mg/L
  - Phosphorus: 0.1 mg/L
- Effluent Quality (dry season)
  - CBOD/TSS: <2 mg/L
  - Ammonia: <0.1 mg/L
  - Phosphorus:<0.1 mg/L



Forest Grove WWTF/NTS and Hillsboro WWTF

Forest Grove WWTF/NTS:

- 2016 NPDES permit authorizes year-around discharge from Forest Grove WWTF
- Mechanical plant followed by a natural treatment system
- 95 acre natural treatment system
  - 5 acre active (engineered) system
  - 90 acre passive system – nutrient & temperature reduction and effluent polishing
- Operational in 2017

Hillsboro WWTF:

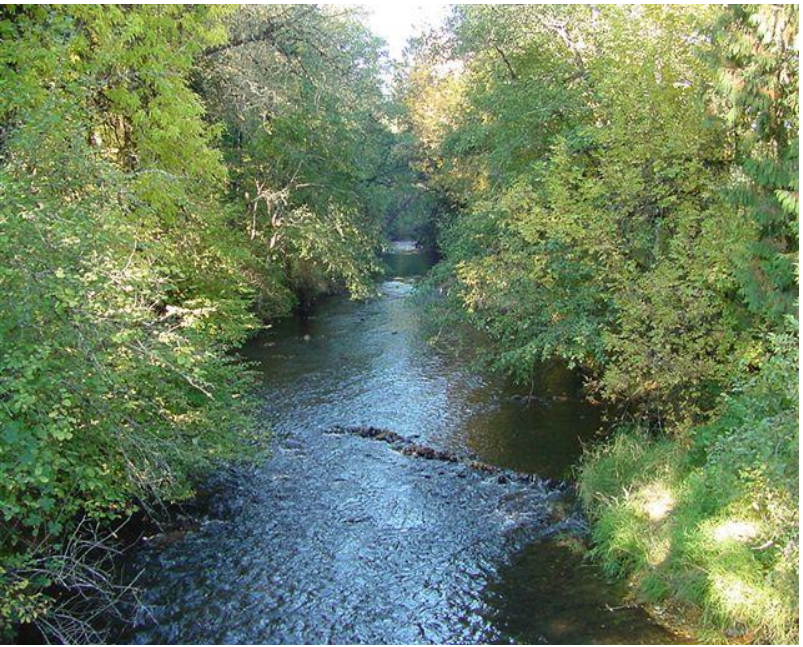
- Conventional secondary treatment facility
- Operates only during wet season
- Flows routed to either Rock Creek or Forest Grove during dry season

Stormwater Management

Stormwater Management

- Industrial/commercial stormwater
- Construction stormwater
- Education and outreach
- Post construction runoff
- Stormwater retrofits
- Operation and maintenance
- Illicit discharges

Watershed Enhancement Activities



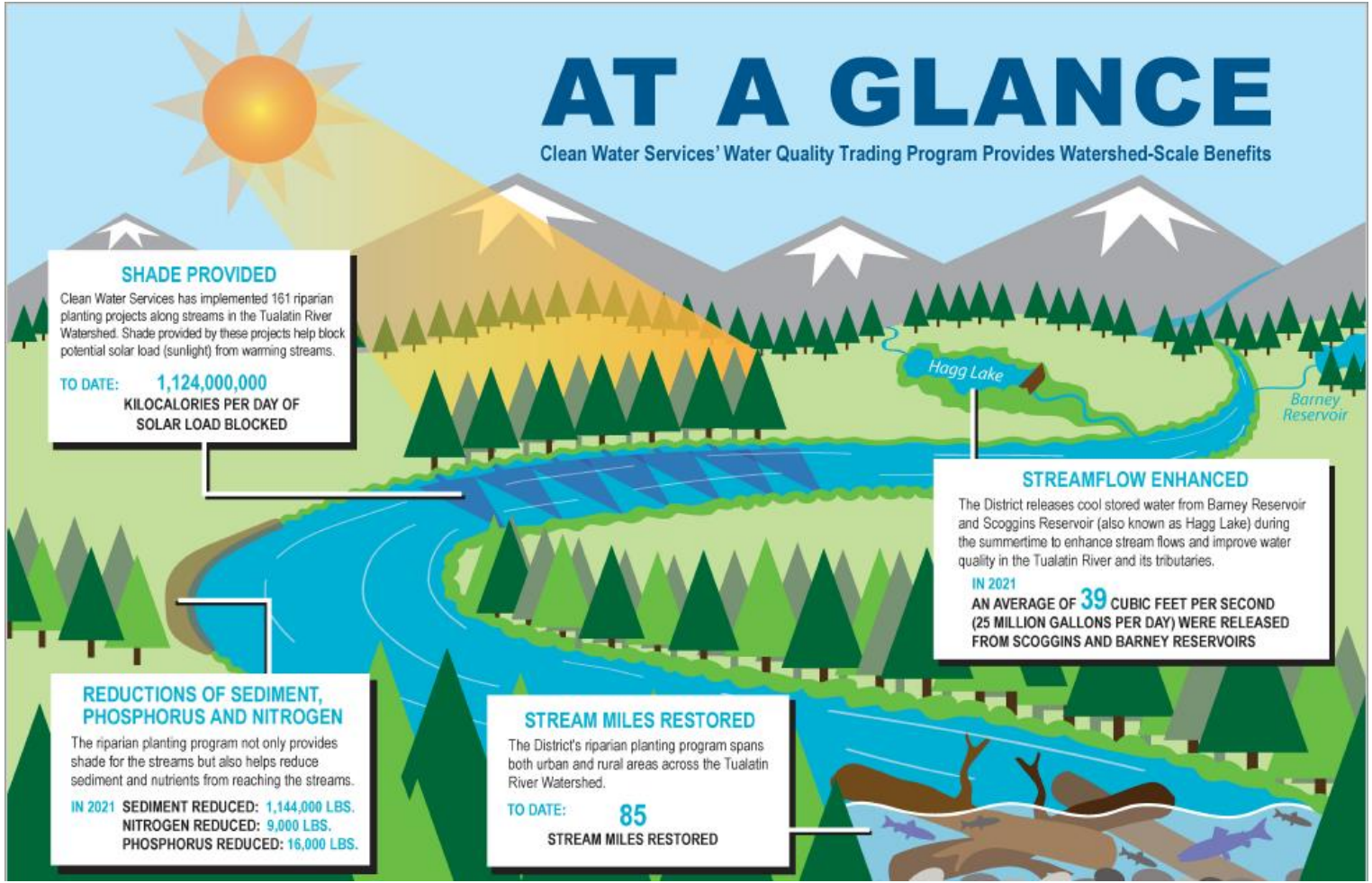
Watershed Enhancement Activities

- Reduce thermal load to the extent feasible at WWTFs
  - Source Control
  - WWTF improvements
  - Recycled water use
- Water quality trading program
- Flow Enhancement
  - Mainstem Tualatin River
  - Key tributaries
- Stream enhancement
  - Riparian planting
  - Stream and wetland enhancement

Water Quality Trading Summary

- Flow Enhancement:
  - Mainstem Tualatin River: ~40 cfs
  - Tributary Flow Restoration: ~ 5 cfs
- Riparian Shade Planting:
  - 182 projects implemented
  - Total stream miles planted: ~85 miles
- Conclusions:
  - Successfully offset thermal loads from WWTFs
  - Triggered wide spread restoration activities in basin

Water Quality Trading Program Summary



Challenges Ahead

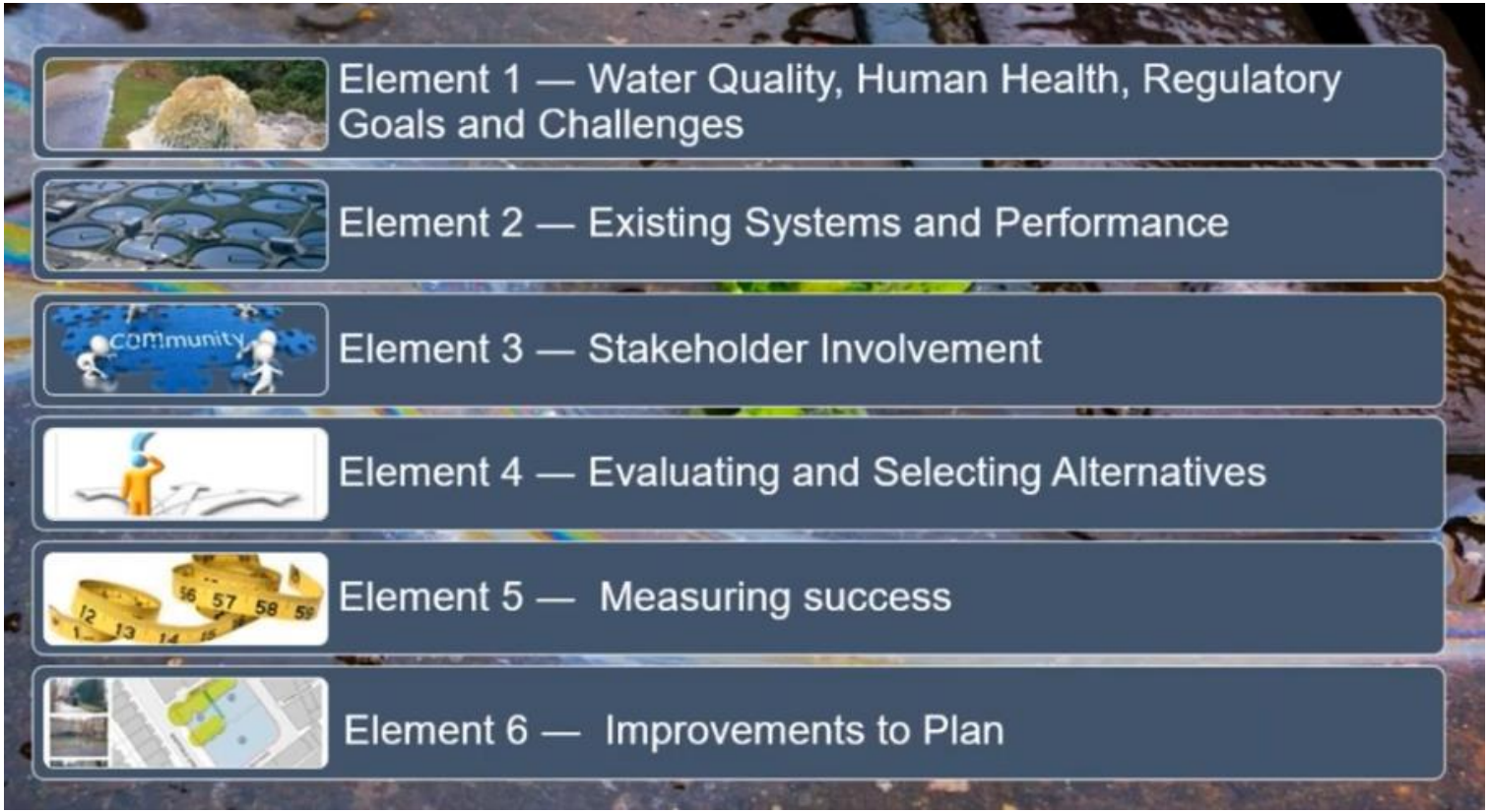
- Maintaining existing infrastructure
- Growth
  - Significant increase in service population
- Regulatory challenges
  - Effluent dominated stream
  - Water quality issues
- Water resources
  - Nearly full utilization
- Climate change
  - Warmer, drier summers
  - Total precipitation/intensity
  - Impact on stored water (availability & usage)
- Sustainable rate structure

EPA Framework for Integrated Planning

Report to Congress on Integrated Plans to Comply with the Water Infrastructure Improvement Act of 2019

- Mechanism to prioritize and meet CWA obligations over a defined time period
- Mostly used in response to enforcement actions (i.e. consent decrees)
- EPA allows use of Integrated Plans as part of NPDES permit actions

EPA Integrated Planning Framework: Elements



Integrated Plan: EPA Report

- From the EPA report on Integrated Planning to Congress:

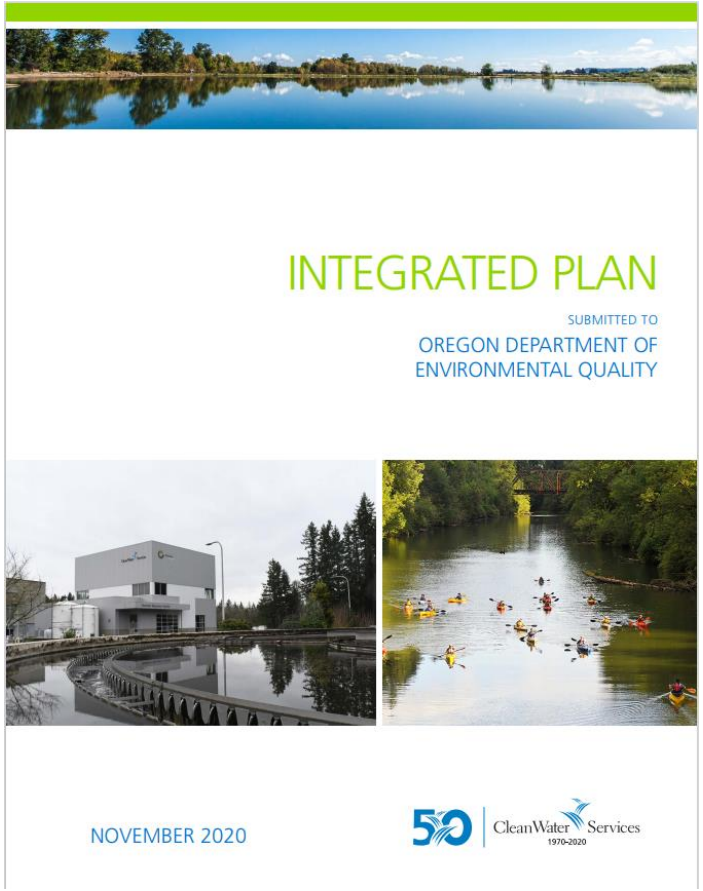
  As municipalities continue to improve their clean water infrastructure, they must successfully navigate and address issues, such as changing rainfall patterns and intensities, population growth and expanding service areas, aging infrastructure, competing priorities for public funds, and increasingly disparate impacts on their full range of ratepayers.

CWS Permit Renewal Application/Integrated Plan

- Integrated Plan an element of NPDES permit application
- Use Integrated Plan to establish long-term permitting strategy; not enforcement driven approach
- Many strategies require regulatory/stakeholder support
- Use Integrated Plan to communicate goals and strategies (regulatory agencies, stakeholders, and public)
- Complements other planning efforts (facilities plans, master plans, sub-basin plans, etc); does not supplant them

Integrated Plan Structure

- Watershed description
- Goals/Objectives
- Current activities
- Effectiveness
- Challenges
- Strategies
- Schedule



Integrated Plan: Goals/Objectives

- Protect public health
- Protect and enhance watershed health
- Maintain existing infrastructure
- Provide infrastructure for anticipated growth
- Resource recovery
- Regulatory compliance
- Sustainable rate structure

Integrated Plan: Current Activities

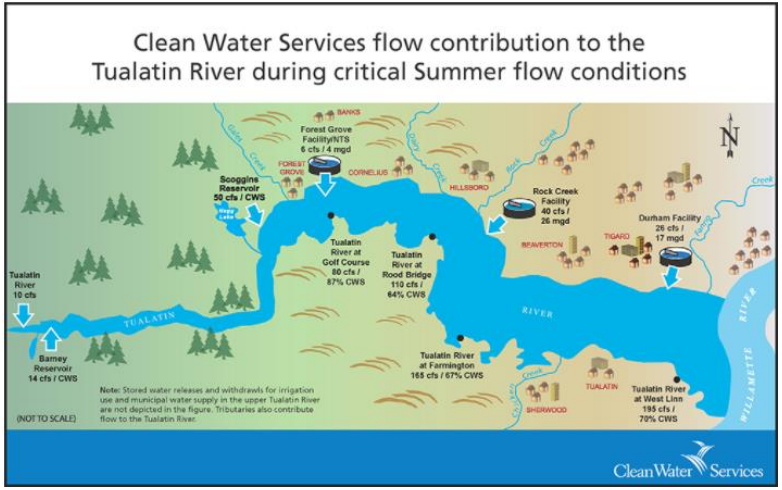
- Wastewater collection
- Wastewater treatment
- Stormwater management
- Watershed enhancement
- Public education/outreach
- Research & Innovation
- Tualatin Basin Dam Safety Project
- Watershed Monitoring

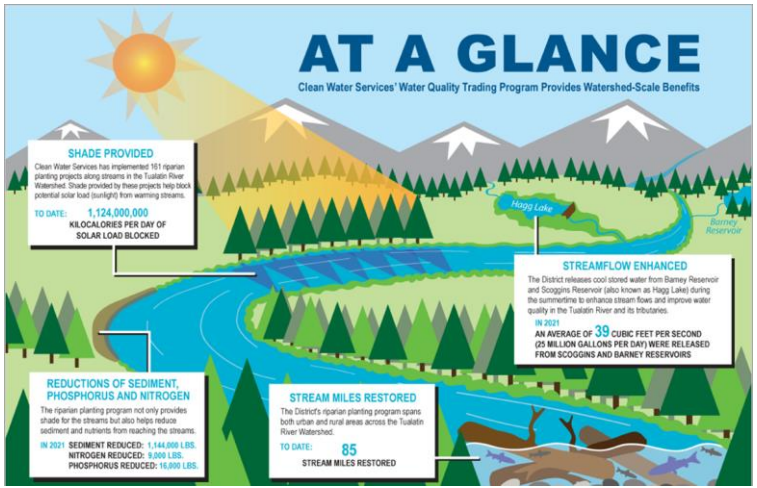
▲ Rock Creek AWWTF

▲ Forest Grove NTS

Program Effectiveness

- Watershed improvements
  - Collection system
    - Capacity, Management, Operations and Maintenance (CMOM) based approach
    - Effectiveness in terms of SSO reduction
  - Wastewater treatment:
    - Advanced treatment facilities
    - Water quality improvements in Tualatin River
    - Resource recovery (energy and nutrients)
  - Stormwater program:
    - Predates MS4 program
    - More than 30 years of providing WQ treatment of stormwater runoff
  - Watershed enhancement
    - Flow enhancement
    - Riparian planting
    - Stream and wetland enhancement
  - Public education & outreach
  - Research & Innovation
    - Direct application of research activities
    - Examples: bio-p reliability, nitrification inhibition testing, vertical flow wetland, disinfection by products at RC and DM, etc.





Integrated Plan: Challenges

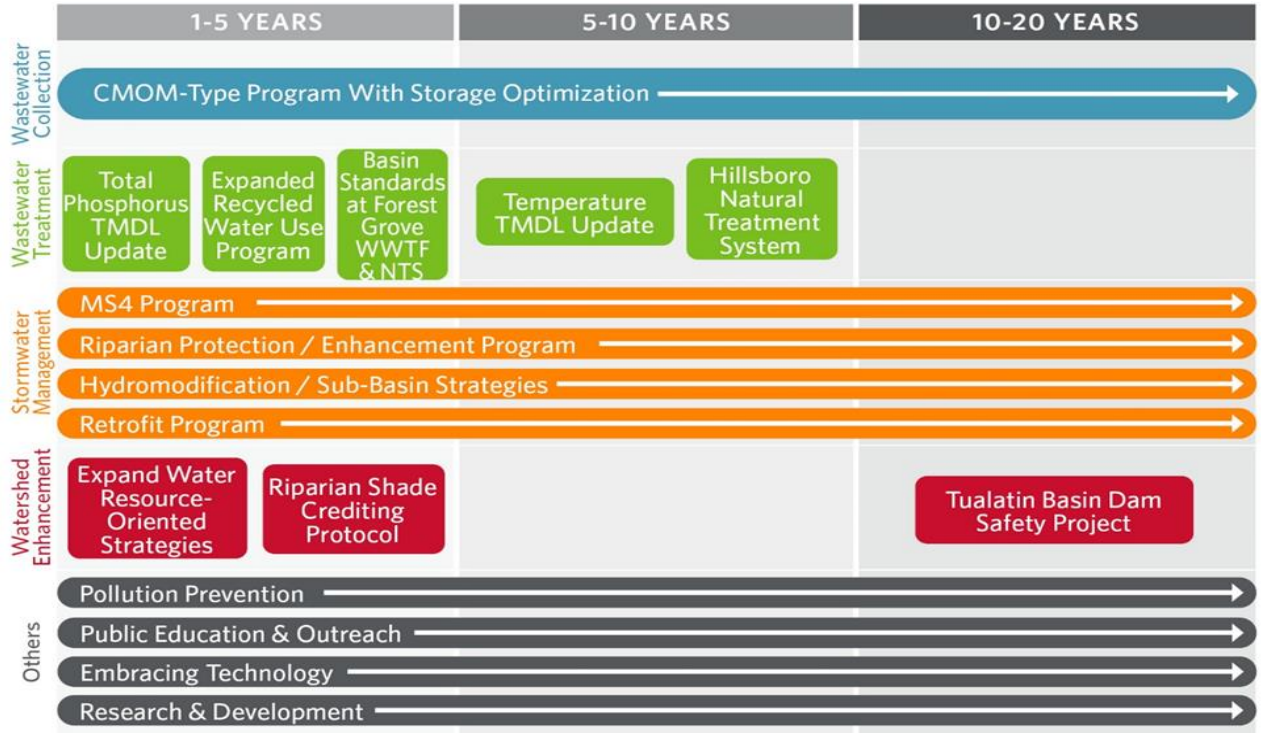
- Maintaining/replacing aging infrastructure
- Anticipated growth
- Regulatory requirements
- Water resource limitations
- Climate change impacts
- Sustainable rate structure

▲ Field Operations staff replacing section of collection system piping

Integrated Plan: New Strategies

- Wastewater Treatment
  - Sustainable treatment: Update phosphorus TMDL for Tualatin River
  - Sustainable treatment/use of natural systems
  - Resource limitations: Expand recycled water use program
- Stormwater Management
  - Sub-basin approach for coordinated action in upland areas and streams
- Watershed enhancement activities
  - Access to additional stored water (by providing recycled water)
  - Obtain water rights & lease them as in-stream flow
- Technology considerations
  - Continued to incorporate real-time instrumentation to manage systems
  - Reduce labor intensive monitoring (WWTF monitoring)

Schedule



- Adaptive management
  - Periodically update plan
  - Likely every permit cycle (~5 years)

Outreach: Internal & External

- Outreach:
  - Met with each workgroup
  - CWS Board of Directors
  - Advisory Commission (members from industry, agriculture, development community, environmental organizations, public at large/neighborhood reps)
  - Oregon DEQ

Status/Next Steps

- Oregon DEQ has reviewed the Integrated Plan
- Having discussions on:
  - Concept
  - Strategies
  - Mechanism to capture Integrated Plan (Memorandum of Agreement?)
- Permit expected to be renewed in Q3 2022

Benefits

- Essential for CWS to have a long term permitting plan
  - Large discharge to a small(ish) stream
  - NPDES cycle not conducive to planning
  - Strategies to meet regulatory requirements and enhance watershed health take time to develop
  - Cannot be implemented unilaterally; regulatory action necessary
  - Public/stakeholder support
- Benefits for Oregon DEQ
  - Proactive planning; issues are not being dealt in enforcement arena
  - Encourages approaches that provide broad benefits (beyond just meeting regulatory requirements)


Questions?
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