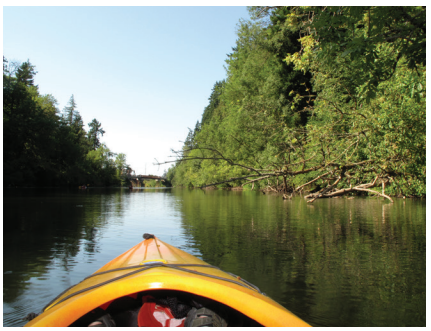
2025 Annual Report

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM

WATERSHED-BASED WASTE DISCHARGE PERMIT



Clean Water Services

Clean Water Services

National Pollutant Discharge Elimination System (NPDES) Watershed-Based Waste Discharge Permit Annual Report

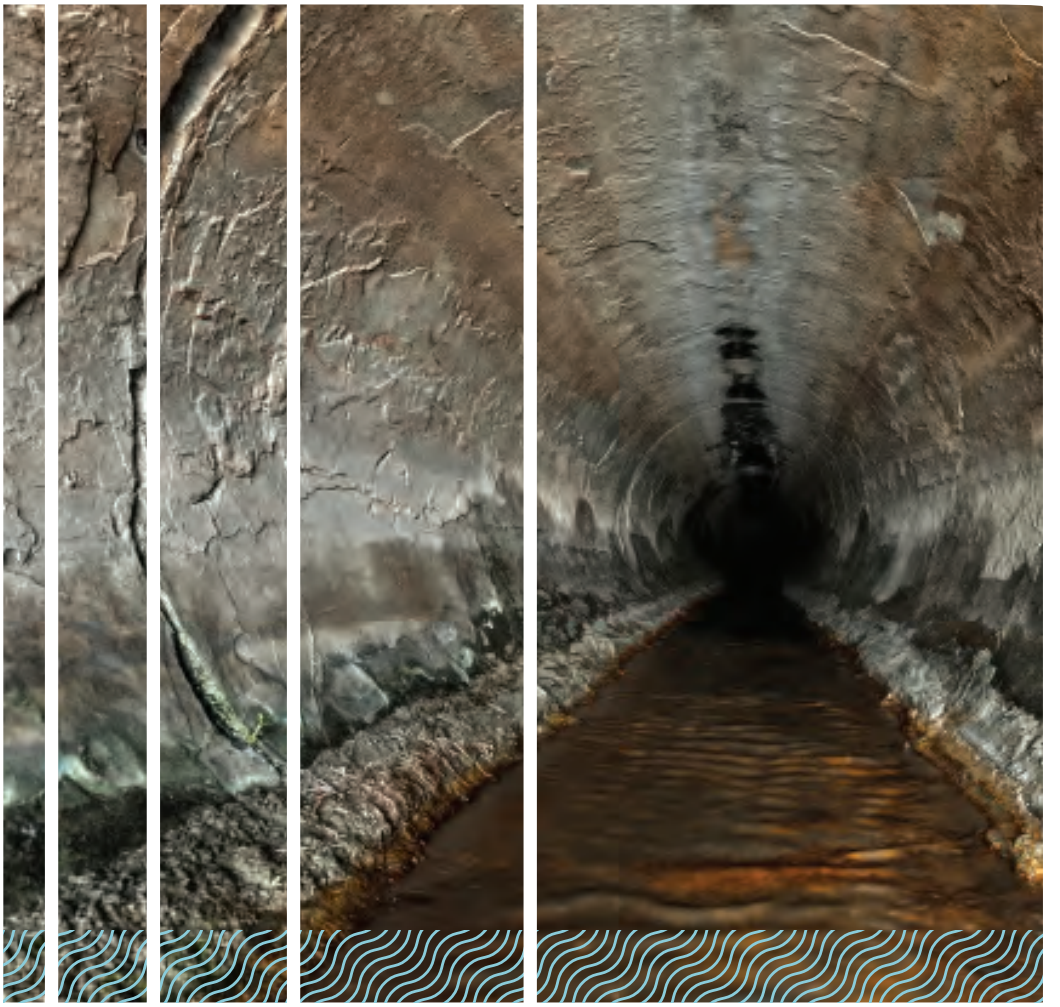
March 2025

Clean Water Services hereby submits this NPDES Watershed-Based Waste Discharge Permit Annual Report in accordance with NPDES Permit Numbers 101141, 101142, 101143 and 101144. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for the gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Diane Taniguchi-Dennis
Chief Executive Officer

2025 Annual Report

Inflow and Infiltration



Clean Water Services

1. Introduction

Schedule D.1 of the Clean Water Services (CWS) watershed-based NPDES Permit requires an annual inflow and infiltration (I/I) report which must include:

- An assessment of I/I issues at the four water resource recovery facilities based on comparisons of summer and winter flows.
- Details of activities performed in the previous year to identify and reduce I/I.
- Details of activities planned for the following year to identify and reduce I/I.
- A summary of sanitary sewer overflows that occurred during the previous year.

CWS is making continual progress in identifying and reducing I/I throughout the collection system. CWS continued its commitment to I/I abatement and rehabilitation through its Capital Improvement Program (CIP) and substantial maintenance, television (TV) inspection, and flow monitoring programs. Staff members use these programs to identify, quantify, and reduce I/I within the sanitary sewer collection system.

2. Collection System Description

CWS' collection system includes assets owned by CWS or its co-implementers including 44 pump stations, approximately 1,850 miles of sanitary sewer line, 70 miles of force main, and about 48,713 sanitary sewer manholes. Pipes range from 4 inches to 84 inches in diameter. CWS has intergovernmental agreements with each of the 12 cities in its service area and with Washington County that articulate the division of responsibilities and Performance Standards for managing, operating, and maintaining the collection system. The Performance Standards detail maintenance frequency and measurement criteria for activities such as line cleaning, manhole maintenance and repairs, root control, TV inspections, and emergency response. These standards provide consistency across the entire service area and are designed to maintain the collection system efficiently and cost-effectively; promptly identify and address potential issues; and minimize the risk of sanitary sewer overflows due to inadequate capacity, maintenance, or structural deficiencies.

3. Inflow and Infiltration Abatement Programs – 2024

3.1 Inflow and Infiltration Assessment

The following table summarizes the statistics used to compare dry weather and wet weather flows at CWS' four water resource recovery facilities (WRRFs) to support an assessment of facility I/I issues in 2024. Wet weather flows include those from November to April; dry weather flows include those from May through October.

Table 1: 2024 Water Resource Recovery Facility Influent Flow Statistics

Daily Average Flow	Rock Creek	Durham	Forest Grove	Hillsboro
Average wet weather flow, MGD	48.8	30.6	6.8	6.9
Maximum month wet weather flow, mgd	66.1	40.9	10.4	11.0
Peak wet weather flow, MGD	106.3	72.0	17.5	17.8
Peak wet weather flow, MGD	106.3	68.8	15.3	11.3
Wet weather peaking factor	2.2	2.2	2.6	2.6
Average dry weather flow, MGD	32.0	20.6	4.3	3.3
Average dry weather flow, MGD	28.0	17.6	3.1	0.0
Maximum month dry weather flow, mgd		25.1	5.0	4.6
Peak dry weather flow, MGD	71.9	42.0	8.6	8.4
Dry weather peaking factor	2.2	2.0	2.0	2.6
Ratio of wet weather to dry weather average monthly flow	1.5	1.5	1.6	2.1

Peaking factors in excess of 4 and high ratios of wet versus dry average flows are considered to be an indication of significant levels of I/I entering the sanitary sewer system. Wet weather peaking factors at the WRRFs ranged from 2.2 to 2.6; winter to summer average flow ratios range from 1.5 to 2.1. The Forest Grove WRRF and Hillsboro WWRF have the highest wet weather peaking factor of 2.6. The Hillsboro and Forest Grove WRRFs have the highest wet versus dry average flow ratio of 2.1 and 1.6, respectively.

CWS is focusing on capital projects to reduce I/I in the Forest Grove basin and the City of Hillsboro is partnering with CWS to focus on I/I reduction in its city. The relatively high peaking factors indicate the need for CWS to continue monitoring conveyance system flows in the Forest Grove and Hillsboro facility basins while continuing to evaluate potential project locations for I/I reduction opportunities as part of the West Basin I/I Abatement Study.

3.2 Activities Performed in 2024 to Identify and Reduce I/I

3.2.1 Capital Improvement Program

Capital Improvement Program Staffing: In 2024, CWS employed a division manager (0.5 FTE) and senior engineer (1 FTE) to work on CWS' I/I reduction program. The division manager is responsible for managing the overall I/I reduction program and the large-diameter sewer rehabilitation program. The senior engineer is responsible for planning, designing, and administering the I/I abatement projects.

CIP Prioritization: CWS has observed rapid residential growth over the past decade and anticipates this trend will continue. Capital project priorities have accordingly been focused on capacity assurance. One method of providing capacity is reducing I/I. Recent I/I abatement efforts have targeted high I/I basins to achieve capacity for growth and to reduce or eliminate downstream gravity sewer, pump station, and water resource recovery facility expansion projects.

3.3 Study and Project Summary 2024

3.3.1 Clean Water Services

Aloha 3 Pump Station Project: In 2022, CWS began a project to investigate the collection system for I/I-driven capacity constraints within the collection system tributary to the Aloha 3 Pump Station. The results of this investigation will determine the potential for I/I abatement within the subject flow basin to offset future improvements at the pump station. These results will be presented in 2025.

Cedar Hills Rehabilitation: This project includes replacing approximately 13,000 linear feet of 6, 8, and 10-inch sanitary sewer mainline and their associated structures and service lateral connections to reduce the I/I observed in this basin. The project is under construction for $5.5 million. Construction is scheduled to conclude in 2025.

East Basin Master Plan: Approximately $30 million in I/I reduction improvements were identified in the East Basin Master Plan for the Durham WRRF sewershed. In 2024, CWS began investigating the I/I removal opportunities and the feasibility of how I/I removal will help offset future capital projects in this basin.

I/I Abatement Master Planning: CWS continued to review flow meter data and strategically relocated meters to further isolate and identify the sanitary flow basins experiencing the highest rates of I/I. Refer to the Flow Monitoring section of this report.

West Basin Master Plan: CWS is studying I/I abatement as a part of the West Basin Master Plan to better understand the I/I influence from the sewershed areas tributary to the Hillsboro, Rock Creek, and Forest Grove WRRFs.

3.3.2 City of Beaverton

SW 131st Barlow to Hanson Road I/I Abatement: CWS placed five flow monitors in a 250-acre residential area in 2020 and 2021. The City of Beaverton began a more concentrated investigation into the 45-acre 131st Avenue (Barlow to Hanson) subbasin,

which contributes the highest levels of I/I among the five basins where flow was monitored. Investigation and design in the basin proceeded in 2024.

3.3.3 City of Hillsboro

NW 1911-1936 Turner Creek Sanitary I/I Abatement: The City of Hillsboro continued the design to rehabilitate or replace the remaining sanitary sewer in the NW 1911-1936 Turner Creek Sanitary Sewer District.

3.4 Activities Planned for 2025 to Identify and Reduce I/I

3.4.1 Clean Water Services

Aloha 3 Pump Station Project: Investigation and planning for the Aloha 3 Pump Station basin is expected to conclude in 2025 to determine the current state of the pump station and what improvements are necessary. The investigation will help determine future I/I projects within the Aloha 3 Pump Station tributary basin.

Bohmann Exposed Mainlines Rehabilitation: This project addresses two locations of exposed sewer mainlines crossing Fanno Creek and the high calculated I/I for the surrounding areas. Work will include rehabilitating approximately 2,000 linear feet of mainline with the associated structures and service laterals. Planning and design are scheduled to begin in 2025.

Cedar Hills I/I Abatement: Construction is continuing in 2025 and is expected to conclude in 2025 to rehabilitate approximately 13,000 linear feet of 6, 8, and 10-inch sanitary sewer mainline, the associated access structures, and service lateral connections.

East Basin I/I Abatement and Rehabilitation: The planning and evaluation of the scope of the necessary I/I abatement projects will continue in 2025; the evaluation is expected to be completed in late 2025. Design is expected to occur from 2026 through 2029 with construction following according to the priority and need of the projects.

Fanno Interceptor Pipeline Rehabilitation: This project was identified in the East Basin Master Plan and will involve rehabilitating approximately 45,000 linear feet of the existing 36-inch to 60-inch diameter interceptor. The evaluation of this project will be completed in 2025 with design scheduled to begin in 2026 and continue through 2028. Construction is expected to take five years.

Forest Grove I/I Abatement: Design of phase 3 is expected to begin early in 2025 to help address the high I/I observed at the Forest Grove WRRF during some storms. The project will consist of approximately 4,000 linear feet of pipe and include the associated structures and service laterals. Design of phase 3 will continue until the end of 2025 with construction anticipated in 2025 and 2026.

I/I Abatement Master Planning: CWS annually reviews flow meter data and strategically relocates meters to further isolate and identify the sanitary flow basins experiencing the highest rates of I/I. Refer to the Flow Monitoring section of this report.

West Basin Master Plan: CWS is studying I/I abatement as a part of the West Basin Master Plan to help better understand the I/I influence from the sewershed areas tributary to the Hillsboro, Rock Creek, and Forest Grove WRRFs. The anticipated completion of the plan in 2025 will determine the scope and priority of future I/I abatement projects performed within the west basin.

3.4.2 City of Hillsboro

NW 1911-1936 Turner Creek Sanitary I/I Abatement: The City of Hillsboro is commencing construction of the sixth phase of the NW 1911-1936 Turner Creek Sanitary Sewer District rehabilitation and I/I abatement in January 2025 and work is expected to continue through October 2026.

3.4.3 City of Beaverton

SW 131st Barlow to Hanson Road: The 131st Barlow to Hanson Road project is the first phase of a five-phase I/I abatement project in the Erickson trunkline basin after an investigation determined that the 131st Avenue subbasin has the highest I/I rates in the basin. The City of Beaverton is managing the project. During the past year, the City conducted CCTV investigations and smoke testing to identify the appropriate approaches and engineering design to abate the I/I. The City of Beaverton is planning to complete the investigation and design in 2025.

4. Operations and Maintenance

CWS provides regional services for chemical or mechanical root control, manhole rehabilitation activities, and flow monitoring, which are presented in this report.

Lateral Rehabilitation: CWS continued implementing its comprehensive lateral rehabilitation per Resolution and Order (R&O 98-67). CWS CCTV inspected 70 private laterals and repaired or replaced 51 laterals as part of routine maintenance.

Manhole Rehabilitation and Root Control: CWS performed chemical or mechanical root control on 36,854 linear feet of sanitary sewer. CWS crews rehabilitated 62 manholes to eliminate or reduce infiltration and completed 18 internal pipe repairs to reduce infiltration.

Flow Monitoring: CWS continued to operate and upgrade its flow monitoring program in 2024, which includes 45 portable flow meters. The portable flow meters provide flexibility in monitoring locations and allow flow data to be collected in support of CWS and its co-implementers' capital projects. CWS has 57 permanent flow monitors installed throughout the sanitary conveyance system and maintains 14 telemetered rain gauges across the service area. Flow monitoring data provides conveyance system and plant operators information to better manage their respective systems and provides data for I/I evaluation.

CWS uses flow monitoring within the gravity sanitary conveyance system and at pump stations to record flows. Flow monitors are generally located on major conveyance

trunklines, upstream of some CWS pump stations and strategically placed branches off the trunk lines in CWS-owned and city-owned systems.

CWS places flow meters for three primary purposes: model calibration, I/I analysis, and Field Operations flow monitoring.

Model Calibration: Modeling analyses help identify areas with higher I/I and prioritize I/I abatement projects. Flow meters are placed throughout the sanitary conveyance system for model calibration, typically, on major trunk lines, branches off major trunk lines, or in an area of the system where additional information is needed.

I/I Analysis: Flow meter placement is also determined based on modeling analyses showing which larger trunk lines, pump stations, or WWRF basins are experiencing high I/I. CWS analyzes where flow meters are located and then breaks down the basin into smaller, similar-sized areas to determine where the I/I originates. Flow meter placement is also determined during CWS master planning efforts and by evaluating pump station runtimes during the wet versus dry weather periods.

Field Operations: Flow meters are placed throughout the CWS sanitary conveyance system in locations that have shown high flows and where modeling suggests surcharge conditions. Field Operations monitors these locations in real time, receiving an alarm if crews need to be deployed for potential remediation of high flow conditions or a potential sanitary sewer overflow (SSO).

Flow monitor data is evaluated year-round, but primarily during the wet weather period (November – April). The data is analyzed and input into a model of the entire CWS system to determine where high flows and I/I are found. Modeling is typically conducted for the larger basins and then the basins are broken down into smaller subbasins if additional investigation is needed.

Preventive Maintenance Program: The Performance Standards for CWS and its co-implementers include internal pipe CCTV inspection of every line once every eight years. All new construction is internally inspected at the time of construction and again within 12 months after construction is completed.

CWS crews TV inspected 631,653 linear feet of sanitary sewer one or more times within its maintenance area. CWS' co-implementers inspected an additional 948,292 linear feet of sanitary sewer one or more times. The combined CWS and co-implementer effort represent internal pipe inspection of 16.7% of the total system inventory of sanitary sewer lines.

5. Summary of Sanitary Sewer Overflows

CWS implements a program to reduce SSOs based on the capacity, management, operation, and maintenance approach. For wastewater collection systems, a key performance indicator is the number of SSOs per 100 miles of sewer pipe per year. Over

the past nine years (2016-2024), CWS has averaged fewer than one SSO per 100 miles of sewer main per year, indicative of a high-performing collection system.

This section summarizes SSOs in 2024. The date given is the date the SSO started; if the start date is unknown the date the SSO was first reported to CWS or a co-implementer city is listed. CWS and cities responded to eight SSOs in 2024, of which two reached surface waters. Of the eight events, the causes included three blockages caused by wipes, roots, and grease; one from a collapsed line due to a tree falling; one from a contractor flushing excess water in a sanitary line; one from material in an air release valve that caused improper sealing and leaking; one from an incorrect valve configuration during construction at the Forest Grove WRRF; and one from a contractor bore-through of an air release valve pipeline. For all SSOs, appropriate corrective action was taken as described. CWS submitted written reports on all SSOs to DEQ, except when waived by DEQ.

1. **Date: February 27, 2024**
   OERS #: 2024-0535
   Location: 3149 Periwinkle Street, Forest Grove
   Estimated volume: Approximately 70 gallons.
   Cause: Contractor flushing private sanitary lines as part of new development over the amount authorized by CWS resulted in overflow from a downstream public sanitary manhole.
   Follow-up actions: The City notified the contractor to stop flushing the line and educated the contractor on the seriousness and impact of exceeding the amount authorized to be discharged to CWS' sanitary system. City staff used a vactor truck to clean the impacted areas and a nearby stormwater catch basin as a precaution.
   Results of ambient monitoring: The SSO did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on March 1, 2024.

2. **Date: April 19, 2024**
   OERS #: 2024-0957
   Location: 8805 SW Hill View Terrace, Portland
   Estimated volume: Unknown.
   Cause: Tree fell causing a collapsed line and overflow.
   Follow-up actions: The SSO was contained to the excavated area left from the root ball when a tree was removed. CWS field staff used a vactor truck to clean the impacted areas while repairing the impacted sanitary line.
   Results of ambient monitoring: The SSO was contained to the excavated area left from the tree falling and did not reach surface waters or the MS4. CWS submitted the 5-day report to Oregon DEQ on April 24, 2024.

3. **Date: April 20, 2024**
   OERS #: 2024-0958
   Location: 13670 SW Mapleview Lane, Tigard
   Estimated volume: Unknown.

Cause: Blockage of wipes and roots in a public sanitary manhole.

Follow-up actions: The roots and wipes in the manhole are believed to be the cause of the blockage in the public sanitary gravity line. Crews used a jetter/combo truck to clear the blockage and clean the bark chips impacted by the overflow. CWS' Field Operations construction crew removed the roots and sealed the manhole.

Results of ambient monitoring: The SSO did not reach surface waters or the MS4. CWS submitted the 5-day report to Oregon DEQ on April 24, 2024.

4. **Date: May 13, 2024**

   OERS #: 2024-1145
   Location: 16230 SW Ludwig Street, Beaverton
   Estimated volume: Unknown.
   Cause: Blockage of wipes and roots in public sanitary mainline.
   Follow-up actions: CWS field crews determined that the public system was backed up due to roots blocking flow in the public sanitary mainline. Crews used a jetter truck to clear the blockage in the public mainline and re-establish flow in the line. Crews applied root-foaming chemicals to treat the roots.

   Results of ambient monitoring: The SSO did not reach surface waters or the MS4. CWS submitted the 5-day report to Oregon DEQ on May 17, 2024.

5. **Date: June 22, 2024**

   OERS #: 2024-1501
   Location: 930 SW 197th Avenue, Beaverton
   Estimated volume: Unknown.
   Cause: Blockage from grease and roots in sanitary line.
   Follow-up actions: CWS crews cleared the blockage, reestablished flow in the line, and used a vactor truck to clean the impacted areas. CWS crews posted signage.
   Results of ambient monitoring: CWS crews did not witness the overflow entering Beaverton Creek as the initial response was at night. Confirmation sampling was conducted on June 22, 24, and 26; results from June 24 and 26 showed no impact from the overflow on surface waters. Oregon DEQ granted an extension on the submittal of the 5-day report; CWS submitted the report to DEQ on July 10, 2024.

6. **Date: October 14, 2024**

   OERS #: 2024-2672
   Location: 2550 SW Hillsboro Highway-Jackson Bottom Wetlands Preserve, Hillsboro
   Estimated volume: Unknown.
   Cause: Incorrect valve configuration resulted in sewage discharged through CWS recycled water lines.
   Follow-up actions: CWS' Field Operations crews cleaned the impacted areas and used a vactor truck to vacuum the wash water. Oregon DEQ granted an extension for the submittal of the 5-day report; CWS submitted the report to DEQ on November 15, 2024.

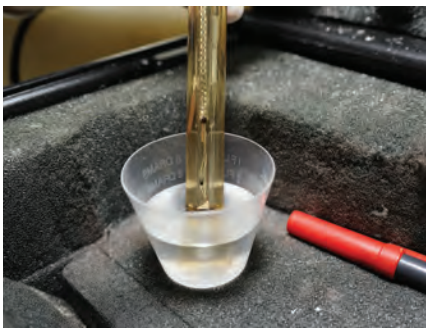
Results of ambient monitoring: Sampling was conducted on October 15 and 18; results were indicative of typical surface water concentrations for *E. coli* suggesting that the overflow did not reach surface waters or the MS4.

7. **Date: November 27, 2024**
   OERS #: 2024-3052
   Location: NW Wilksboro Road and Highway 47, Banks
   Estimated volume: Approximately 500 gallons.
   Cause: Material in air release valve caused improper sealing and leaking.
   Follow-up actions: CWS crews used a vactor truck to clean the impacted area and posted signs. The air release valve was replaced with a spare valve. CWS' pump station team plans to replace all the air release valves in the conveyance system with new valves over the next few years; starting with areas prioritized by chance of failure and public impact of failure based on location.
   Results of ambient monitoring: The SSO did not reach surface waters or the MS4.

8. **Date: December 20, 2024**
   OERS #: 2024-3219
   Location: SW 209th Avenue and Kinnaman Road, Hillsboro
   Estimated volume: Approximately 34,300 gallons.
   Cause: Incorrect locates resulted in contractor bore-through of air release valve sanitary pipeline.
   Follow-up actions: CWS Field Operations crews cleaned the impacted areas including the road and stormwater system, flushed the stormwater system, and vactored the wash water. CWS will conduct regular training for staff on working with contractors and performing locates.
   Results of ambient monitoring: Samples were taken on December 19, 20, and 23 from a stormwater catch basin, the inlet and outlet of a stormwater quality swale, and from a manhole and two culverts located upstream and downstream of stormwater detention ponds. The overflow did not reach surface waters; follow-up sample results showed no further impact of the overflow on the MS4. Oregon DEQ granted an extension for the submittal of the 5-day report; CWS submitted the report to DEQ on January 3, 2025.

2025 Annual Report

Pretreatment Program



Clean Water Services

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Form 1 – Cover Sheet

Control Authority Name: Clean Water Services

Treatment Plant Name(s) and Addresses:

Durham Water Resource Recovery Facility
16580 SW 85th Avenue, Tigard, Oregon 97224

		Expiration Date:
EPA Number:	OR-0028118	November 30, 2027
DEQ permit Number:	101141	
DEQ File Number:	90735	
Population Served:	200,121	
Pretreatment Contact:	Jamie Hughes	
Title:	Program Manager 3 & Interim Environmental Services Manager	
Address:	2550 SW Hillsboro Highway	
City, State, Zip Code:	Hillsboro, Oregon, 97123-9379	
Telephone:	503.681.4456	
Fax:	503.681.5138	
Email:	HughesJ@cleanwaterservices.org	

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

POTW Authorized Signatory

03/25/25
Date

Diane Taniguchi-Dennis
Print Name

Chief Executive Officer
Title

Form 1 – Cover Sheet

Control Authority Name: Clean Water Services

Treatment Plant Name(s) and Addresses:

Forest Grove Water Resource Recovery Facility with Natural Treatment System
1345 SW Fern Hill Road, Forest Grove, Oregon 97116

		Expiration Date:
EPA Number:	OR-0020168	November 30, 2027
DEQ permit Number:	101142	
DEQ File Number:	90745	
Population Served:	47,353	
Pretreatment Contact:	Jamie Hughes	
Title:	Program Manager 3 & Interim Environmental Services Manager	
Address:	2550 SW Hillsboro Highway	
City, State, Zip Code:	Hillsboro, Oregon, 97123-9379	
Telephone:	503.681.4456	
Fax:	503.681.5138	
Email:	HughesJ@cleanwaterservices.org	

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Diane Taniguchi-Dennis — 03/25/25

POTW Authorized Signatory — Date

Diane Taniguchi-Dennis — Chief Executive Officer

Print Name — Title

Form 1 – Cover Sheet

Control Authority Name: Clean Water Services

Treatment Plant Name(s) and Addresses:

Hillsboro Water Resource Recovery Facility
770 South First Avenue, Hillsboro, Oregon 97123

		Expiration Date:
EPA Number:	OR-0023345	November 30, 2027
DEQ permit Number:	101143	
DEQ File Number:	90752	
Population Served:	40,139	
Pretreatment Contact:	Jamie Hughes	
Title:	Program Manager 3 & Interim Environmental Services Manager	
Address:	2550 SW Hillsboro Highway	
City, State, Zip Code:	Hillsboro, Oregon, 97123-9379	
Telephone:	503.681.4456	
Fax:	503.681.5138	
Email:	HughesJ@cleanwaterservices.org	

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Diane Taniguchi-Dennis — 03/25/25

POTW Authorized Signatory — Date

Diane Taniguchi-Dennis — Chief Executive Officer

Print Name — Title

Form 1 – Cover Sheet

Control Authority Name: Clean Water Services

Treatment Plant Name(s) and Addresses:

Rock Creek Water Resource Recovery Facility
3235 SE River Road, Hillsboro, Oregon 97123

		Expiration Date:
EPA Number:	OR-0029777	November 30, 2027
DEQ permit Number:	101144	
DEQ File Number:	90770	
Population Served:	318,576	
Pretreatment Contact:	Jamie Hughes	
Title:	Program Manager 3 & Interim Environmental Services Manager	
Address:	2550 SW Hillsboro Highway	
City, State, Zip Code:	Hillsboro, Oregon, 97123-9379	
Telephone:	503.681.4456	
Fax:	503.681.5138	
Email:	HughesJ@cleanwaterservices.org	

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

POTW Authorized Signatory

03/25/25
Date

Diane Taniguchi-Dennis
Print Name

Chief Executive Officer
Title

Form 2 – Program Status and Update

1. Approval Date of Original Pretreatment Program and date incorporated into NPDES/WPCF permit:

   Initial date of Pretreatment Program approval: August 22, 1978

   Date incorporated into NPDES permit: March 13, 1983

2. Program Materials Under Development (Date Planned for Submission):

   Clean Water Services (CWS) has initiated several efforts to update its program materials. CWS is updating its Hauled Waste Control Plan (document draft of the Hauled Waste Control Plan was submitted to DEQ on October 8, 2024) and Hauled Waste Permit (planned submission by December 2025). Clean Water Services is also editing the Industrial User Fact Sheet template (planned submission by May 2025) and Pretreatment Inspection Form (planned submission by May 2025). CWS will submit all finalized materials to DEQ for approval.

   At the time of report submission, CWS has finalized the Hauled Waste Permit Application, Nondomestic Waste Discharge Permits, and its Nondomestic Waste Discharge Application and Instructions (submitted as a non-substantial program modification to DEQ on January 24, 2025).

3. Program Materials Submitted for Review/Approval (Date Submitted):

   CWS did not submit program materials for DEQ review or approval in 2024.

4. Program Materials Approved Since Original Pretreatment Program Approval

Date Approved	Description of Modification	Date Incorporated into NPDES/WPCF Permit
February 28, 2022	Local Limits	January 1, 2023
December 8, 2022	Mercury Minimization Plan	January 1, 2023
January 29, 2021	Nondomestic Waste Ordinance 42	January 1, 2023
June 22, 2021	Industrial Pretreatment Program Implementation Manual	January 1, 2023

5. Date of last Pretreatment Compliance Audit:

   April 21-24, 2021 (virtual), September 16, 2021 (site visits)

6. Local Limits:

a) Date of most recent technical evaluation for local limits: Date: May 28, 2021

b) Date of most recent adopted technically based local limits: Date: February 28, 2022

c) Pollutants for which local limits have been established: See table below.

Pollutant	Limit (mg/L, except pH)
Arsenic	0.23
Cadmium	0.13
Chromium	6.17
Copper	2.71 at Durham, Hillsboro, and Rock Creek. Rock Creek has a mass limit of 8.00 ppd to be distributed to the two semiconductor facilities that discharge to the Rock Creek facility. 1.15 at Forest Grove, which also has a mass limit of 1.24 lb/day for the only contributory SIU.
Cyanide	1.17
Lead	0.7
Mercury	0.006
Molybdenum	0.56 4.26 pounds/day to be distributed to two semiconductor facilities that discharge to the Rock Creek facility and a metal finisher that discharges to the Hillsboro facility.
Nickel	2.26
Selenium	0.35
Silver	0.06
Zinc	1.87
pH	6 – 11 (S.U.)
Fats, oil, and grease	BMP (unitless)

7. Additional Noteworthy Pretreatment Activities/Accomplishments: (include extra pages as needed)

In 2024, CWS continued efforts to understand per- and polyfluoroalkyl substances (PFAS) within its service area. These efforts included continued quarterly sampling of influent, effluent, and biosolids at CWS' water resource recovery facilities (WRRFs) and quarterly sampling of identified key industries. CWS expanded its Industrial User PFAS monitoring efforts and sampled 49 of the 64 permitted priority industrial users at least once.

In response to EPA's December 5, 2022, memorandum "Addressing PFAS Discharges in NPDES Permits and Through Pretreatment Program and Monitoring Programs", CWS finalized its PFAS Management Plan template in 2023. CWS' extensive PFAS monitoring of its permitted industrial users led to the creation of a PFAS Priority Mass List of all permitted industrial users that lists the IUs by PFAS mass loading. The list not only influenced permit amendment cycles but also influenced PFAS monitoring requirements. CWS based sampling frequency requirements for each industrial user on relative PFAS mass contributions and the variability in results over time. Working in phases, CWS selected the largest contributors of PFAS by mass to receive an amended permit with a requirement to develop PFAS Management Plans. In 2024, the Environmental Services Pretreatment program staff amended 35 Industrial User Permits to include a requirement to develop a PFAS Management Plan.

CWS' Environmental Services program continued its annual Industrial Pretreatment Recognition Program. CWS will honor Industrial users that demonstrated compliance with pretreatment requirements by having no pretreatment violations for the previous calendar year. Final Pretreatment Annual Award Certificates will be mailed to the applicable industrial users by May 2025.

Using data collected since 2019 from extensive PFAS monitoring and source control efforts, the Pretreatment program identified the two largest PFAS contributors in the service area. CWS provided education and technical assistance, and the industries decreased the PFAS in their discharges. Now that the larger industrial PFAS sources have been removed, residential sources, and to a lesser degree commercial sources, represent a significant portion of the influent PFAS mass. To focus its efforts, CWS identified eight high-priority commercial sectors. By May 2025, CWS will begin sampling individual commercial businesses for PFAS. CWS expects to expand commercial and residential pollution prevention efforts with targeted outreach materials, and CWS will implement sector-specific checklists for the identified high-priority commercial sectors by June 2026.

Form 3 – Treatment Plant Monitoring

Provide all treatment plant influent, effluent and biosolids (sludge) data for toxic pollutants and non-conventional pollutants collected during the calendar year. Discuss all data anomalies including cause and actions taken to prevent recurrence. Include all re-sampling results for samples taken to meet NPDES/WPCF permit monitoring requirements because of monitoring that was invalidated for any reason. *(See Instructions for completing FORM).*

All effluent data collected and analyzed must be in accordance with 40 CFR 136 and 40 CFR 503 for Biosolids.

Removal efficiencies were calculated using the measured concentrations of pollutants at the facility influent and effluent sampling locations designated on CWS' NPDES watershed-based permit.

Concentration-based percent removals were calculated in the following manner: percent removal = (influent concentration – effluent concentration)/influent concentration, expressed as a percentage, for each date and parameter, by facility.

Load-based percent removals were calculated in the following manner: percent removal = (influent load – effluent load)/influent load, expressed as a percentage, for each date and parameter, by facility.

Table 3--1. Qualifier codes used in Form 3

Qualifier	Description
<	Less than specified value
E	Estimated due to relatively minor sampling or analytical/QC anomalies
NA	Not available

Percent removal rate computations using values preceded by a '<' qualifier was performed using the following procedure:

(1) If the influent test data included a '<' qualifier, the percent removal was not calculated.

(2) If the influent test data did not include a '<' qualifier but the effluent test data did include a '<' qualifier, a value of half the Method Reporting Limit (MRL) was used for the effluent value in the calculation.

(3) Values preceded by the 'E' qualifier were not changed from reported values in the percent removal calculations.

When the flow from the Forest Grove and Hillsboro facilities is routed to the Rock Creek facility for treatment, the effluent flows for the Forest Grove and Hillsboro facilities are reported as zero, and no percent removal is calculated. If the influent or effluent data were not available concurrently, no percent removal was calculated, and "NA" was entered instead.

CWS estimates that the concentration-based negative removal rates, between 0 to -49%, are presumed to be indicating zero removal. The concurrent flow-based removal rates range between -30% to 50%, indicating positive removal rates even if the calculated concentration-based removal is negative. The load-based removal rates are shown in Treatment Plant Monitoring Data tables on the following pages. The hardness removal rates are shown, but there is no local limit for hardness. The hardness data is collected to support calculating any hardness-dependent metals criteria. Hardness is expected to increase across the facilities due to chemical addition in treatment processes. One potential explanation for the apparent negative removal when calculated using concentration occurs when the influent or effluent concentrations are within the margin of error of the laboratory analytical test, essentially showing zero removal. Another

potential explanation for negative removal rates is that the influent and effluent samples used to calculate the removal rates are not of the same "batch" of water moving through the WRRFs. There is a lag time of 1-3 days between the influent and effluent samples based on the time of year, incoming flows, and water resource recovery facility.

For cases where the influent and effluent concentrations produced negative removal rates that were not within the margin of error, the influent concentrations over the three consecutive days of sampling show an elevated concentration that decreases over the next two days. The effluent concentrations show a corresponding lag, probably due to the travel time across the treatment plant. For one case, cyanide at the Durham WRRF, both the concentration-based and the load-based removal rates are greater than -200%. CWS is investigating the source of cyanide at the Durham WRRF.

All influent and effluent samples represented in this report were 24-hour flow composite samples gathered and analyzed per 40 CFR Part 136, except grab samples that are required for cyanide analyses. All biosolids samples were grab samples gathered and analyzed per 40 CFR Part 503 protocols.

The data reported in Form 3 includes the monitoring required by Table B11 of CWS' NDPES permit, as well as additional sampling events that were conducted at each of CWS' facilities beyond what is required in the permit.

When the Natural Treatment System (NTS) was in operation, samples from the Forest Grove facility were collected from the plant effluent before discharge to the NTS, and additional removal occurred through the NTS before discharge to the Tualatin River. Data from the NTS metals monitoring required by Table B8 in the NPDES permit are attached to this report as Appendix A.

The data for the Hillsboro and Forest Grove facilities do not include biosolids concentration values as the solids from these facilities are transferred to the Rock Creek facility for treatment. The biosolids concentration values reported for the Rock Creek facility provide the measure of biosolids derived from all three of these water resource recovery facilities.

Form 3 – Treatment Plant Monitoring Data – Durham

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	50.89	48.69	µg/L	NA	0.725			0.29	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	53.43	51.23	µg/L	0.880	0.687	22%	0.39	0.29	25%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	43.68	40.88	µg/L	0.874	0.717	18%	0.32	0.24	23%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	38.44	36.14	µg/L	1.05	0.765	27%	0.34	0.23	32%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	28.65	27.05	µg/L	NA	0.831			0.19	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	35.23	33.63	µg/L	NA	0.860			0.24	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	24.52	22.92	µg/L	NA	0.837			0.16	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	24.41	22.91	µg/L	1.09	0.813	25%	0.22	0.16	30%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	24.91	23.31	µg/L	1.25	0.813	35%	0.26	0.16	39%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	23.06	21.96	µg/L	1.12	0.849	24%	0.22	0.16	28%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	5/9/2024	27.32	23.80	µg/L	NA	0.603			0.12	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	22.56	20.55	µg/L	NA	< 0.508			0.087	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	21.39	18.34	µg/L	NA	< 0.508			0.078	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	19.44	16.03	µg/L	NA	0.618			0.083	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	20.12	15.66	µg/L	1.54	< 0.508	84%	0.26	0.066	74%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	19.95	16.00	µg/L	1.55	< 0.508	84%	0.26	0.068	74%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	19.15	15.91	µg/L	1.44	< 0.508	82%	0.23	0.067	71%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/6/2024	18.29	16.39	µg/L	1.51	< 0.508	83%	0.23	0.069	70%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/7/2024	18.25	16.05	µg/L	1.63	< 0.508	84%	0.25	0.068	73%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/8/2024	17.72	15.23	µg/L	1.70	< 0.508	85%	0.25	0.065	74%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	50.89	48.69	µg/L	NA	0.697			0.28	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	53.43	51.23	µg/L	< 0.102	< 0.102		0.045	0.044	4%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	43.68	40.88	µg/L	< 0.102	< 0.102		0.037	0.035	6%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	38.44	36.14	µg/L	< 0.102	< 0.102		0.033	0.031	6%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	28.65	27.05	µg/L	NA	< 0.102			0.023	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	35.23	33.63	µg/L	NA	< 0.102			0.029	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	24.52	22.92	µg/L	NA	< 0.102			0.019	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	24.41	22.91	µg/L	< 0.102	< 0.102		0.021	0.019	6%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	24.91	23.31	µg/L	0.151	< 0.102	66%	0.031	0.020	37%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	23.06	21.96	µg/L	0.102	< 0.102	50%	0.02	0.019	5%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	5/9/2024	27.32	23.80	µg/L	NA	< 0.102			0.020	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	22.56	20.55	µg/L	NA	< 0.102			0.017	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	21.39	18.34	µg/L	NA	< 0.102			0.016	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	19.44	16.03	µg/L	NA	< 0.102			0.014	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	20.12	15.66	µg/L	0.107	< 0.102	53%	0.018	0.013	26%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	19.95	16.00	µg/L	0.156	< 0.102	68%	0.026	0.014	48%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	19.15	15.91	µg/L	0.123	< 0.102	59%	0.020	0.014	31%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	18.29	16.39	µg/L	0.130	< 0.102	61%	0.020	0.014	30%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	18.25	16.05	µg/L	0.186	< 0.102	73%	0.028	0.014	52%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	17.72	15.23	µg/L	0.166	< 0.102	69%	0.025	0.013	47%
Chromium	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	50.89	48.69	µg/L	NA	< 0.406			0.16	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	53.43	51.23	µg/L	1.18	< 0.406	83%	0.53	0.17	67%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	43.68	40.88	µg/L	1.34	< 0.406	85%	0.49	0.14	72%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	38.44	36.14	µg/L	1.47	< 0.406	86%	0.47	0.12	74%
Chromium	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	28.65	27.05	µg/L	NA	< 0.406			0.092	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	35.23	33.63	µg/L	NA	< 0.406			0.110	
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	24.52	22.92	µg/L	NA	< 0.406			0.078	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	24.41	22.91	µg/L	1.17	< 0.406	83%	0.24	0.078	67%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	24.91	23.31	µg/L	1.74	< 0.406	88%	0.36	0.079	78%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	23.06	21.96	µg/L	1.45	< 0.406	86%	0.28	0.074	73%
Chromium	ICP/MS Metals, Total Recoverable		0.406	5/9/2024	27.32	23.80	µg/L	NA	< 0.406			0.081	
Chromium	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	22.56	20.55	µg/L	NA	< 0.406			0.070	
Chromium	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	21.39	18.34	µg/L	NA	< 0.406			0.062	
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	19.44	16.03	µg/L	NA	< 0.406			0.054	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	20.12	15.66	µg/L	1.20	< 0.406	83%	0.2	0.053	74%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	19.95	16.00	µg/L	1.89	< 0.406	89%	0.31	0.054	83%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	19.15	15.91	µg/L	1.72	< 0.406	88%	0.27	0.054	80%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	18.29	16.39	µg/L	1.69	< 0.406	88%	0.26	0.055	78%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	18.25	16.05	µg/L	2.31	< 0.406	91%	0.35	0.054	85%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	17.72	15.23	µg/L	2.51	< 0.406	92%	0.37	0.052	86%
Copper	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	50.89	48.69	µg/L	NA	1.78			0.72	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	53.43	51.23	µg/L	9.48	1.54	84%	4.2	0.66	84%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	43.68	40.88	µg/L	11.9	1.94	84%	4.3	0.66	85%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	38.44	36.14	µg/L	15.4	1.52	90%	4.9	0.46	91%
Copper	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	28.65	27.05	µg/L	NA	2.71			0.61	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	35.23	33.63	µg/L	NA	3.06			0.86	
Copper	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	24.52	22.92	µg/L	NA	3.38			0.65	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	24.41	22.91	µg/L	17.4	2.48	86%	3.5	0.47	87%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	24.91	23.31	µg/L	27.8	2.40	91%	5.8	0.47	92%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	23.06	21.96	µg/L	19.7	2.28	88%	3.8	0.42	89%
Copper	ICP/MS Metals, Total Recoverable		0.406	5/7/2024	29.85	27.55	µg/L	NA	1.61			0.37	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/9/2024	27.32	23.80	µg/L	NA	2.79			0.55	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/12/2024	24.52	21.38	µg/L	NA	1.74			0.31	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	22.56	20.55	µg/L	NA	1.60			0.27	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/16/2024	22.99	19.88	µg/L	NA	1.57			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/19/2024	23.08	19.81	µg/L	NA	1.44			0.24	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/21/2024	24.49	22.13	µg/L	NA	1.53			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/23/2024	22.37	19.66	µg/L	NA	1.48			0.24	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/26/2024	20.12	17.59	µg/L	NA	1.56			0.23	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/28/2024	21.02	18.42	µg/L	NA	1.73			0.27	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/30/2024	21.09	17.92	µg/L	NA	1.38			0.21	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/2/2024	27.41	24.00	µg/L	NA	1.48			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/4/2024	25.20	22.15	µg/L	NA	0.901			0.17	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/6/2024	23.56	20.07	µg/L	NA	1.58			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/9/2024	21.70	18.81	µg/L	NA	2.10			0.33	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	21.39	18.34	µg/L	NA	2.01			0.31	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/13/2024	21.57	18.78	µg/L	NA	2.18			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/16/2024	21.14	18.09	µg/L	NA	2.72			0.41	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/18/2024	20.76	17.89	µg/L	NA	2.42			0.36	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/20/2024	21.06	17.54	µg/L	NA	2.57			0.38	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/23/2024	19.81	17.61	µg/L	NA	2.19			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/25/2024	20.02	16.82	µg/L	NA	2.43			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/27/2024	19.83	16.23	µg/L	NA	2.16			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/30/2024	19.76	16.58	µg/L	NA	1.64			0.23	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/2/2024	20.57	17.57	µg/L	NA	1.75			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/4/2024	18.53	15.29	µg/L	NA	1.56			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/7/2024	20.61	16.39	µg/L	NA	1.54			0.21	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/9/2024	19.50	16.28	µg/L	NA	1.55			0.21	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	19.44	16.03	µg/L	NA	1.38			0.18	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	20.12	15.66	µg/L	24.7	1.36	94%	4.1	0.18	96%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	19.95	16.00	µg/L	30.2	1.43	95%	5.0	0.19	96%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	19.15	15.91	µg/L	27.2	1.34	95%	4.3	0.18	96%
Copper	ICP/MS Metals, Total Recoverable		0.406	7/18/2024	20.21	15.68	µg/L	NA	1.49			0.19	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/21/2024	19.36	16.13	µg/L	NA	1.45			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/23/2024	18.88	16.14	µg/L	NA	1.50			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/25/2024	18.97	15.76	µg/L	NA	1.49			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/28/2024	18.68	15.73	µg/L	NA	2.26			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/30/2024	19.38	15.99	µg/L	NA	2.41			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/1/2024	18.68	15.56	µg/L	NA	2.53			0.33	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/4/2024	18.95	15.79	µg/L	NA	2.41			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/6/2024	18.85	15.62	µg/L	NA	2.61			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/8/2024	19.17	15.94	µg/L	NA	3.07			0.41	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/11/2024	19.09	15.68	µg/L	NA	3.57			0.47	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/15/2024	18.14	15.87	µg/L	NA	2.21			0.29	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable		0.406	8/18/2024	20.00	17.19	µg/L	NA	2.29			0.33	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/20/2024	18.69	16.24	µg/L	NA	2.37			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/22/2024	19.07	16.57	µg/L	NA	2.51			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/25/2024	18.84	16.62	µg/L	NA	2.91			0.40	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/27/2024	20.60	17.00	µg/L	NA	3.05			0.43	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/29/2024	18.70	15.61	µg/L	NA	2.21			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/1/2024	17.94	14.75	µg/L	NA	2.38			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	19.29	15.80	µg/L	NA	2.16			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/5/2024	18.73	15.73	µg/L	NA	1.70			0.22	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/10/2024	18.96	16.14	µg/L	NA	1.74			0.23	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/12/2024	20.09	16.39	µg/L	NA	2.99			0.41	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/15/2024	18.72	16.50	µg/L	NA	2.30			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	19.12	16.10	µg/L	NA	2.44			0.33	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/19/2024	19.69	16.28	µg/L	NA	2.32			0.31	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/22/2024	18.12	15.98	µg/L	NA	2.55			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/24/2024	18.30	16.53	µg/L	NA	2.52			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/26/2024	19.56	17.15	µg/L	NA	1.95			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/29/2024	19.35	16.71	µg/L	NA	2.53			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/1/2024	18.41	15.33	µg/L	NA	2.75			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/3/2024	17.25	15.84	µg/L	NA	4.20			0.55	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	18.29	16.39	µg/L	30.5	5.38	82%	4.7	0.74	84%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	18.25	16.05	µg/L	34.7	3.35	90%	5.3	0.45	92%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	17.72	15.23	µg/L	43.7	3.05	93%	6.5	0.39	94%
Copper	ICP/MS Metals, Total Recoverable		0.406	10/10/2024	18.27	15.35	µg/L	NA	2.77			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/13/2024	18.51	15.97	µg/L	NA	4.70			0.63	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/15/2024	19.19	16.59	µg/L	NA	5.74			0.79	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/17/2024	18.76	16.46	µg/L	NA	7.09			0.97	
Copper	ICP/MS Metals, Total Recoverable		0.406	11/26/2024	30.01	27.30	µg/L	NA	1.83			0.42	
Copper	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	22.39	19.83	µg/L	NA	1.6			0.26	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cyanide	Cyanide, Total	1	1	1/29/2024	43.68	40.88	µg/L	1.19	1.55	-30%	0.43	0.53	-22%
Cyanide	Cyanide, Total	1	1	1/30/2024	38.44	36.14	µg/L	1.33	1.84	-38%	0.43	0.55	-30%
Cyanide	Cyanide, Total	1	1	1/31/2024	34.99	33.49	µg/L	1.43	4.53	-220%	0.42	1.3	-200%
Cyanide	Cyanide, Total	1	1	4/8/2024	24.91	23.31	µg/L	2.14	2.54	-19%	0.44	0.49	-11%
Cyanide	Cyanide, Total	1	1	4/9/2024	23.06	21.96	µg/L	3.16	2.88	9%	0.61	0.53	13%
Cyanide	Cyanide, Total	1	1	4/10/2024	22.47	20.77	µg/L	2.41	2.96	-23%	0.45	0.51	-14%
Cyanide	Cyanide, Total	1	1	7/15/2024	19.95	16.00	µg/L	3.67	2.60	29%	0.61	0.35	43%
Cyanide	Cyanide, Total	1	1	7/16/2024	19.15	15.91	µg/L	2.17	2.80	-29%	0.35	0.37	-7%
Cyanide	Cyanide, Total	1	1	7/17/2024	19.51	16.17	µg/L	3.55	5.30	-49%	0.58	0.71	-24%
Cyanide	Cyanide, Total		1	9/3/2024	19.29	15.80	µg/L	NA	3.50			0.46	
Cyanide	Cyanide, Total	1	1	10/7/2024	18.25	16.05	µg/L	3.87	3.26	16%	0.59	0.44	26%
Cyanide	Cyanide, Total	1	1	10/8/2024	17.72	15.23	µg/L	4.18	2.95	29%	0.62	0.37	39%
Cyanide	Cyanide, Total	1	1	10/9/2024	18.55	15.83	µg/L	4.1	3.97	3%	0.63	0.52	17%
Hardness	ICP/MS Metals, Total Recoverable		0.5	1/9/2024	50.89	48.69	mg/L	NA	80.3			33000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/28/2024	53.43	51.23	mg/L	73.2	78.7	-8%	33000	34000	-3%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/29/2024	43.68	40.88	mg/L	75.8	84.2	-11%	28000	29000	-4%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/30/2024	38.44	36.14	mg/L	85.7	90.5	-6%	27000	27000	1%
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/6/2024	28.65	27.05	mg/L	NA	95.2			21000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/20/2024	31.51	29.71	mg/L	NA	96.7			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/5/2024	35.23	33.63	mg/L	NA	88.6			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/19/2024	24.09	22.49	mg/L	NA	109			20000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/2/2024	24.52	22.92	mg/L	NA	107			20000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/7/2024	24.41	22.91	mg/L	97.4	106	-9%	20000	20000	-2%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/8/2024	24.91	23.31	mg/L	104	104	0%	22000	20000	6%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/9/2024	23.06	21.96	mg/L	105	104	1%	20000	19000	6%
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/16/2024	20.82	19.42	mg/L	NA	100			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/2/2024	26.58	23.77	mg/L	NA	94.9			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/5/2024	37.88	33.98	mg/L	NA	87.1			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/7/2024	29.85	27.55	mg/L	NA	95.6			22000	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/9/2024	27.32	23.80	mg/L	NA	108			21000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/12/2024	24.52	21.38	mg/L	NA	127			23000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/14/2024	22.56	20.55	mg/L	NA	131			22000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/16/2024	22.99	19.88	mg/L	NA	143			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/19/2024	23.08	19.81	mg/L	NA	134			22000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/21/2024	24.49	22.13	mg/L	NA	128			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/23/2024	22.37	19.66	mg/L	NA	128			21000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/26/2024	20.12	17.59	mg/L	NA	127			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/28/2024	21.02	18.42	mg/L	NA	119			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/30/2024	21.09	17.92	mg/L	NA	109			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/2/2024	27.41	24.00	mg/L	NA	121			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/4/2024	25.20	22.15	mg/L	NA	133			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/6/2024	23.56	20.07	mg/L	NA	122			20000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/9/2024	21.70	18.81	mg/L	NA	141			22000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/11/2024	21.39	18.34	mg/L	NA	139			21000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/13/2024	21.57	18.78	mg/L	NA	140			22000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/16/2024	21.14	18.09	mg/L	NA	125			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/18/2024	20.76	17.89	mg/L	NA	141			21000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/20/2024	21.06	17.54	mg/L	NA	139			20000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/23/2024	19.81	17.61	mg/L	NA	127			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/25/2024	20.02	16.82	mg/L	NA	137			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/27/2024	19.83	16.23	mg/L	NA	121			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/30/2024	19.76	16.58	mg/L	NA	136			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/2/2024	20.57	17.57	mg/L	NA	153			22000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/4/2024	18.53	15.29	mg/L	NA	151			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/7/2024	20.61	16.39	mg/L	NA	142			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/9/2024	19.50	16.28	mg/L	NA	133			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/11/2024	19.44	16.03	mg/L	NA	130			17000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/14/2024	20.12	15.66	mg/L	85.7	133	-55%	14000	17000	-21%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/15/2024	19.95	16.00	mg/L	97.6	134	-37%	16000	18000	-10%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/16/2024	19.15	15.91	mg/L	88.8	131	-48%	14000	17000	-23%
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/18/2024	20.21	15.68	mg/L	NA	133			17000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/21/2024	19.36	16.13	mg/L	NA	134			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/23/2024	18.88	16.14	mg/L	NA	135			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/25/2024	18.97	15.76	mg/L	NA	130			17000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/28/2024	18.68	15.73	mg/L	NA	134			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/30/2024	19.38	15.99	mg/L	NA	134			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/1/2024	18.68	15.56	mg/L	NA	135			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/4/2024	18.95	15.79	mg/L	NA	144			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/6/2024	18.85	15.62	mg/L	NA	141			18000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/8/2024	19.17	15.94	mg/L	NA	130			17000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/11/2024	19.09	15.68	mg/L	NA	128			17000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/15/2024	18.14	15.87	mg/L	NA	104			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/18/2024	20.00	17.19	mg/L	NA	91.2			13000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/20/2024	18.69	16.24	mg/L	NA	104			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/22/2024	19.07	16.57	mg/L	NA	110			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/25/2024	18.84	16.62	mg/L	NA	100			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/27/2024	20.60	17.00	mg/L	NA	107			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/29/2024	18.70	15.61	mg/L	NA	121			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/1/2024	17.94	14.75	mg/L	NA	131			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/3/2024	19.29	15.80	mg/L	NA	119			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/5/2024	18.73	15.73	mg/L	NA	116			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/10/2024	18.96	16.14	mg/L	NA	112			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/12/2024	20.09	16.39	mg/L	NA	112			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/15/2024	18.72	16.50	mg/L	NA	116			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/17/2024	19.12	16.10	mg/L	NA	119			16000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/19/2024	19.69	16.28	mg/L	NA	102			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/22/2024	18.12	15.98	mg/L	NA	108			14000	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/24/2024	18.30	16.53	mg/L	NA	107			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/26/2024	19.56	17.15	mg/L	NA	108			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/29/2024	19.35	16.71	mg/L	NA	109			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/1/2024	18.41	15.33	mg/L	NA	108			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/3/2024	17.25	15.84	mg/L	NA	110			15000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/6/2024	18.29	16.39	mg/L	83.4	112	-34%	13000	15000	-20%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/7/2024	18.25	16.05	mg/L	83.8	113	-35%	13000	15000	-19%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/8/2024	17.72	15.23	mg/L	82.7	116	-40%	12000	15000	-21%
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/10/2024	18.27	15.35	mg/L	NA	112			14000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/13/2024	18.51	15.97	mg/L	NA	110			15000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/15/2024	19.19	16.59	mg/L	NA	92.8			13000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/17/2024	18.76	16.46	mg/L	NA	90			12000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/12/2024	27.35	24.66	mg/L	NA	93.6			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/26/2024	30.01	27.30	mg/L	NA	105			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/3/2024	22.39	19.83	mg/L	NA	115			19000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/17/2024	46.46	43.90	mg/L	NA	79			29000	
Lead	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	50.89	48.69	µg/L	NA	< 0.102			0.041	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	53.43	51.23	µg/L	0.46	< 0.102	89%	0.20	0.044	79%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	43.68	40.88	µg/L	0.489	0.111	77%	0.18	0.038	79%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	38.44	36.14	µg/L	0.591	< 0.102	91%	0.19	0.031	84%
Lead	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	28.65	27.05	µg/L	NA	0.105			0.024	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	35.23	33.63	µg/L	NA	< 0.102			0.029	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	24.52	22.92	µg/L	NA	0.137			0.026	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	24.41	22.91	µg/L	0.724	< 0.102	93%	0.15	0.019	87%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	24.91	23.31	µg/L	1.38	< 0.102	96%	0.29	0.020	93%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	23.06	21.96	µg/L	0.698	0.118	83%	0.13	0.022	84%
Lead	ICP/MS Metals, Total Recoverable		0.1015	5/9/2024	27.32	23.80	µg/L	NA	0.115			0.023	
Lead	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	22.56	20.55	µg/L	NA	0.139			0.024	
Lead	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	21.39	18.34	µg/L	NA	0.178			0.027	

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	19.44	16.03	µg/L	NA	0.149			0.020	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	20.12	15.66	µg/L	0.79	0.143	82%	0.13	0.019	86%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	19.95	16.00	µg/L	1.32	0.161	88%	0.22	0.021	90%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	19.15	15.91	µg/L	0.962	0.148	85%	0.15	0.020	87%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	18.29	16.39	µg/L	0.988	< 0.102	95%	0.15	0.014	91%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	18.25	16.05	µg/L	1.33	< 0.102	96%	0.20	0.014	93%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	17.72	15.23	µg/L	1.12	0.124	89%	0.17	0.016	90%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/28/2024	53.43	51.23	ng/L	22.6	1.42	94%	0.010	0.00061	94%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/29/2024	43.68	40.88	ng/L	37.7	1.45	96%	0.014	0.00049	96%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/30/2024	38.44	36.14	ng/L	22.4	2.14	90%	0.0072	0.00065	91%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/7/2024	24.41	22.91	ng/L	81	1.33	98%	0.016	0.00025	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/8/2024	24.91	23.31	ng/L	81.1	1.6	98%	0.017	0.00031	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/9/2024	23.06	21.96	ng/L	41.8	1.9	96%	0.0080	0.00035	96%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/14/2024	20.12	15.66	ng/L	33.2	0.643	98%	0.0056	0.000084	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/15/2024	19.95	16.00	ng/L	45.3	0.62	99%	0.0075	0.000083	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/16/2024	19.15	15.91	ng/L	93.4	0.76	99%	0.015	0.00010	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/6/2024	18.29	16.39	ng/L	66.9	0.742	99%	0.010	0.00010	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/7/2024	18.25	16.05	ng/L	61.2	0.73	99%	0.0093	0.000098	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/8/2024	17.72	15.23	ng/L	212	1	100%	0.031	0.00013	100%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	50.89	48.69	µg/L	NA	3.3			1.3	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	53.43	51.23	µg/L	0.715	0.634	11%	0.32	0.27	15%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	43.68	40.88	µg/L	0.872	0.596	32%	0.32	0.20	36%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	38.44	36.14	µg/L	1.05	0.607	42%	0.34	0.18	46%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	28.65	27.05	µg/L	NA	0.891			0.20	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	35.23	33.63	µg/L	NA	1.24			0.35	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	24.52	22.92	µg/L	NA	2.13			0.41	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	24.41	22.91	µg/L	11.9	9.26	22%	2.4	1.8	27%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	24.91	23.31	µg/L	13.8	10.7	22%	2.9	2.1	27%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	23.06	21.96	µg/L	15.1	12.7	16%	2.9	2.3	20%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	5/9/2024	27.32	23.80	µg/L	NA	2.13			0.42	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	22.56	20.55	µg/L	NA	2.01			0.34	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	21.39	18.34	µg/L	NA	1.78			0.27	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	19.44	16.03	µg/L	NA	2.51			0.34	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	20.12	15.66	µg/L	9.31	3.47	63%	1.6	0.45	71%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	19.95	16.00	µg/L	19.4	9.56	51%	3.2	1.3	60%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	19.15	15.91	µg/L	7.41	14.1	-90%	1.2	1.9	-58%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	18.29	16.39	µg/L	1.73	1.13	35%	0.26	0.15	41%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	18.25	16.05	µg/L	2.07	1.05	49%	0.32	0.14	55%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	17.72	15.23	µg/L	2.45	1.18	52%	0.36	0.15	59%
Nickel	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	50.89	48.69	µg/L	NA	1.23			0.50	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	53.43	51.23	µg/L	1.87	1.16	38%	0.83	0.50	41%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	43.68	40.88	µg/L	2.62	1.39	47%	0.95	0.47	50%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	38.44	36.14	µg/L	2.89	1.41	51%	0.93	0.42	54%
Nickel	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	28.65	27.05	µg/L	NA	1.63			0.37	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	35.23	33.63	µg/L	NA	1.47			0.41	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	24.52	22.92	µg/L	NA	3.20			0.61	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	24.41	22.91	µg/L	3.05	2.45	20%	0.62	0.47	25%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	24.91	23.31	µg/L	4.58	2.17	53%	0.95	0.42	56%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	23.06	21.96	µg/L	3.98	2.34	41%	0.77	0.43	44%
Nickel	ICP/MS Metals, Total Recoverable		0.406	5/9/2024	27.32	23.80	µg/L	NA	2.47			0.49	
Nickel	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	22.56	20.55	µg/L	NA	2.04			0.35	
Nickel	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	21.39	18.34	µg/L	NA	2.04			0.31	
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	19.44	16.03	µg/L	NA	2.10			0.28	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	20.12	15.66	µg/L	3.04	1.96	36%	0.51	0.26	50%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	19.95	16.00	µg/L	4.08	1.84	55%	0.68	0.25	64%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	19.15	15.91	µg/L	4.07	1.92	53%	0.65	0.25	61%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	18.29	16.39	µg/L	4.16	3.12	25%	0.63	0.43	33%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	18.25	16.05	µg/L	11.4	2.54	78%	1.7	0.34	80%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	17.72	15.23	µg/L	11.7	2.84	76%	1.7	0.36	79%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	50.89	48.69	µg/L	NA	< 0.508			0.21	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	53.43	51.23	µg/L	< 0.508	< 0.508		0.23	0.22	4%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	43.68	40.88	µg/L	< 0.508	< 0.508		0.19	0.17	6%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	38.44	36.14	µg/L	< 0.508	< 0.508		0.16	0.15	6%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	28.65	27.05	µg/L	NA	< 0.508			0.11	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	35.23	33.63	µg/L	NA	< 0.508			0.14	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	24.52	22.92	µg/L	NA	< 0.508			0.097	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	24.41	22.91	µg/L	< 0.508	< 0.508		0.10	0.097	6%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	24.91	23.31	µg/L	< 0.508	< 0.508		0.11	0.099	6%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	23.06	21.96	µg/L	< 0.508	< 0.508		0.098	0.093	5%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	5/9/2024	27.32	23.80	µg/L	NA	< 0.508			0.10	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	22.56	20.55	µg/L	NA	< 0.508			0.087	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	21.39	18.34	µg/L	NA	< 0.508			0.078	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	19.44	16.03	µg/L	NA	< 0.508			0.068	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	20.12	15.66	µg/L	< 0.508	< 0.508		0.085	0.066	22%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	19.95	16.00	µg/L	< 0.508	< 0.508		0.085	0.068	20%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	19.15	15.91	µg/L	0.590	< 0.508	57%	0.094	0.067	28%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/6/2024	18.29	16.39	µg/L	< 0.508	< 0.508		0.077	0.069	10%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/7/2024	18.25	16.05	µg/L	0.524	< 0.508	52%	0.080	0.068	15%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/8/2024	17.72	15.23	µg/L	0.729	< 0.508	65%	0.11	0.065	40%
Silver	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	50.89	48.69	µg/L	NA	< 0.102			0.041	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	53.43	51.23	µg/L	< 0.102	< 0.102		0.045	0.044	4%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	43.68	40.88	µg/L	< 0.102	< 0.102		0.037	0.035	6%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	38.44	36.14	µg/L	1.14	< 0.102	96%	0.370	0.031	92%
Silver	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	28.65	27.05	µg/L	NA	< 0.102			0.023	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	35.23	33.63	µg/L	NA	< 0.102			0.029	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	24.52	22.92	µg/L	NA	< 0.102			0.019	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	24.41	22.91	µg/L	0.148	< 0.102	66%	0.030	0.019	35%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	24.91	23.31	µg/L	0.366	< 0.102	86%	0.076	0.020	74%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	23.06	21.96	µg/L	0.138	< 0.102	63%	0.027	0.019	30%
Silver	ICP/MS Metals, Total Recoverable		0.1015	5/9/2024	27.32	23.80	µg/L	NA	< 0.102			0.020	
Silver	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	22.56	20.55	µg/L	NA	< 0.102			0.017	
Silver	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	21.39	18.34	µg/L	NA	< 0.102			0.016	
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	19.44	16.03	µg/L	NA	< 0.102			0.014	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	20.12	15.66	µg/L	0.199	< 0.102	74%	0.033	0.013	60%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	19.95	16.00	µg/L	0.187	< 0.102	73%	0.031	0.014	56%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	19.15	15.91	µg/L	0.335	< 0.102	85%	0.054	0.014	75%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	18.29	16.39	µg/L	0.595	< 0.102	92%	0.091	0.014	85%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	18.25	16.05	µg/L	0.467	< 0.102	89%	0.071	0.014	81%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	17.72	15.23	µg/L	0.210	< 0.102	76%	0.031	0.013	58%
Zinc	ICP/MS Metals, Total Recoverable		2.537	1/9/2024	50.89	48.69	µg/L	NA	26.8			11	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/28/2024	53.43	51.23	µg/L	48.2	33.8	30%	21	14	33%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/29/2024	43.68	40.88	µg/L	59.6	37.7	37%	22	13	41%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/30/2024	38.44	36.14	µg/L	70.2	32.9	53%	23	9.9	56%
Zinc	ICP/MS Metals, Total Recoverable		2.537	2/6/2024	28.65	27.05	µg/L	NA	36.5			8.2	
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/5/2024	35.23	33.63	µg/L	NA	28.9			8.1	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/2/2024	24.52	22.92	µg/L	NA	45.9			8.8	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/7/2024	24.41	22.91	µg/L	86.5	33.5	61%	18	6.4	64%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/8/2024	24.91	23.31	µg/L	99.3	33.8	66%	21	6.6	68%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/9/2024	23.06	21.96	µg/L	92.3	31.8	66%	18	5.8	67%
Zinc	ICP/MS Metals, Total Recoverable		2.537	5/9/2024	27.32	23.80	µg/L	NA	37.8			7.5	
Zinc	ICP/MS Metals, Total Recoverable		2.537	5/14/2024	22.56	20.55	µg/L	NA	40.7			7.0	
Zinc	ICP/MS Metals, Total Recoverable		2.537	6/11/2024	21.39	18.34	µg/L	NA	43.2			6.6	
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/11/2024	19.44	16.03	µg/L	NA	39.2			5.2	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/14/2024	20.12	15.66	µg/L	133	44.9	66%	22	5.9	74%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/15/2024	19.95	16.00	µg/L	148	41.7	72%	25	5.6	77%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/16/2024	19.15	15.91	µg/L	152	42.2	72%	24	5.6	77%

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/6/2024	18.29	16.39	µg/L	134	39.5	70%	20	5.4	74%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/7/2024	18.25	16.05	µg/L	160	38.3	76%	24	5.1	79%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/8/2024	17.72	15.23	µg/L	139	38.5	72%	21	4.9	76%

Form 3 – Treatment Plant Monitoring Data – Durham Biosolids

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.4	1/2/2024	2.78
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	2/12/2024	3.34
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	2/13/2024	3.36
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	2/14/2024	2.87
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	3/11/2024	2.62
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.1	4/15/2024	2.89
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	4/16/2024	2.96
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.2	4/17/2024	2.96
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	5/21/2024	4.64
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	6/18/2024	4.01
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.4	7/15/2024	4.67
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.2	7/16/2024	4.57
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.2	7/17/2024	5.09
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	8/14/2024	4.68
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.4	9/10/2024	5.73
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.5	10/14/2024	4.94
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	10/15/2024	5.2
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.2	10/16/2024	5.11
Durham Centrifuge Cake	Arsenic	ICP/MS Metals, Dry	2.3	11/11/2024	4.57
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.48	1/2/2024	0.788
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	2/12/2024	1.03
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	2/13/2024	1.03
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	2/14/2024	0.933
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	3/11/2024	0.953
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.42	4/15/2024	1.11
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.45	4/16/2024	1.08
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.44	4/17/2024	1.09
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.45	5/21/2024	0.987

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	6/18/2024	0.855
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.48	7/15/2024	0.881
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.45	7/16/2024	0.901
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.44	7/17/2024	0.836
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	8/14/2024	0.733
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.49	9/10/2024	0.905
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.5	10/14/2024	0.742
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.46	10/15/2024	0.801
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.44	10/16/2024	0.745
Durham Centrifuge Cake	Cadmium	ICP/MS Metals, Dry	0.47	11/11/2024	0.969
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.9	1/2/2024	19.4
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.9	2/12/2024	25.8
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	2/13/2024	26.8
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	2/14/2024	23.6
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	3/11/2024	21.8
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.7	4/15/2024	23.6
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	4/16/2024	22.7
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	4/17/2024	23.1
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	5/21/2024	25.6
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	6/18/2024	22.2
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.9	7/15/2024	23.3
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	7/16/2024	20.6
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.7	7/17/2024	22.6
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	8/14/2024	17.5
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	2	9/10/2024	24.4
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	2	10/14/2024	22.3
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.9	10/15/2024	23.9
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.8	10/16/2024	23.5
Durham Centrifuge Cake	Chromium	ICP/MS Metals, Dry	1.9	11/11/2024	25.5
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.9	1/2/2024	189
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.9	2/12/2024	244

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	2/13/2024	242
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	2/14/2024	210
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	3/11/2024	228
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.7	4/15/2024	254
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	4/16/2024	252
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	4/17/2024	255
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	5/21/2024	234
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	6/18/2024	217
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.9	7/15/2024	238
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	7/16/2024	223
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.7	7/17/2024	241
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	8/14/2024	217
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	2	9/10/2024	283
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	2	10/14/2024	272
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.9	10/15/2024	283
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.8	10/16/2024	265
Durham Centrifuge Cake	Copper	ICP/MS Metals, Dry	1.9	11/11/2024	306
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	0	2/12/2024	9.97
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	0	2/13/2024	9.95
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	0	2/14/2024	10.4
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.3	4/15/2024	6.37
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.1	4/16/2024	5.69
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.2	4/17/2024	5.62
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.4	7/15/2024	9.44
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.2	7/16/2024	9.45
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.1	7/17/2024	9.66
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.4	10/14/2024	10.5
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.3	10/15/2024	11.1
Durham Centrifuge Cake	Cyanide	Cyanide, Dry	2.2	10/16/2024	10.3
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	1/2/2024	55400
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	2/12/2024	66900

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	2/13/2024	65600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	2/14/2024	56600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	3/11/2024	59800
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	4/15/2024	68500
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	4/16/2024	66300
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	4/17/2024	65400
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	5/21/2024	67500
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	6/18/2024	70100
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	7/15/2024	77800
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	7/16/2024	69300
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	7/17/2024	75200
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	8/14/2024	65600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	9/10/2024	79600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	10/14/2024	72600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	10/15/2024	76800
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	10/16/2024	71600
Durham Centrifuge Cake	Hardness	ICP/MS Metals, Dry	0	11/11/2024	69700
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.48	1/2/2024	12.1
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	2/12/2024	9.66
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	2/13/2024	10.5
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	2/14/2024	9.02
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	3/11/2024	11.1
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.42	4/15/2024	11.7
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.45	4/16/2024	11.3
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.44	4/17/2024	11.3
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.45	5/21/2024	8.75
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	6/18/2024	8.23
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.48	7/15/2024	7.89
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.45	7/16/2024	6.97
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.44	7/17/2024	7.27
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	8/14/2024	6.4

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.49	9/10/2024	9.7
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.5	10/14/2024	13.5
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.46	10/15/2024	7.6
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.44	10/16/2024	7.41
Durham Centrifuge Cake	Lead	ICP/MS Metals, Dry	0.47	11/11/2024	9.51
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.095	1/2/2024	0.361
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.093	2/12/2024	0.576
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.091	2/13/2024	0.407
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.091	2/14/2024	0.522
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.091	3/11/2024	0.372
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.085	4/15/2024	0.34
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.09	4/16/2024	0.464
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.089	4/17/2024	0.528
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.091	5/21/2024	0.399
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.092	6/18/2024	0.352
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.097	7/15/2024	0.432
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.09	7/16/2024	0.32
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.087	7/17/2024	0.457
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.092	8/14/2024	0.354
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.098	9/10/2024	0.437
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.1	10/14/2024	0.56
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.093	10/15/2024	0.506
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.089	10/16/2024	0.393
Durham Centrifuge Cake	Mercury	ICP/MS Metals, Dry	0.094	11/11/2024	0.582
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.48	1/2/2024	7.33
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	2/12/2024	7.14
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	2/13/2024	7.24
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	2/14/2024	7.01
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	3/11/2024	5.81
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.42	4/15/2024	7.97
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.45	4/16/2024	7.94

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.44	4/17/2024	7.74
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.45	5/21/2024	13
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	6/18/2024	8.1
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.48	7/15/2024	6.37
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.45	7/16/2024	6.58
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.44	7/17/2024	6.99
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	8/14/2024	5.94
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.49	9/10/2024	3.35
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.5	10/14/2024	7.63
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.46	10/15/2024	7.9
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.44	10/16/2024	7.96
Durham Centrifuge Cake	Molybdenum	ICP/MS Metals, Dry	0.47	11/11/2024	8.15
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.9	1/2/2024	15.5
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.9	2/12/2024	20.2
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	2/13/2024	21.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	2/14/2024	19.2
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	3/11/2024	16.8
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.7	4/15/2024	19.3
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	4/16/2024	18.6
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	4/17/2024	18.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	5/21/2024	21.7
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	6/18/2024	18.2
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.9	7/15/2024	25.7
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	7/16/2024	21.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.7	7/17/2024	24.7
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	8/14/2024	21
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	2	9/10/2024	24.3
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	2	10/14/2024	24.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.9	10/15/2024	25.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.8	10/16/2024	24.9
Durham Centrifuge Cake	Nickel	ICP/MS Metals, Dry	1.9	11/11/2024	28.5

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.4	1/2/2024	4.33
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	2/12/2024	4.82
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	2/13/2024	5.07
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	2/14/2024	4.64
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	3/11/2024	4.42
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.1	4/15/2024	4.87
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	4/16/2024	4.89
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.2	4/17/2024	5.02
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	5/21/2024	5.08
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	6/18/2024	4.66
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.4	7/15/2024	5.13
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.2	7/16/2024	4.61
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.2	7/17/2024	4.99
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	8/14/2024	4.62
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.4	9/10/2024	5.27
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.5	10/14/2024	4.71
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	10/15/2024	4.97
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.2	10/16/2024	5.1
Durham Centrifuge Cake	Selenium	ICP/MS Metals, Dry	2.3	11/11/2024	5.29
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.48	1/2/2024	2.03
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	2/12/2024	2.43
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	2/13/2024	2.33
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	2/14/2024	2.2
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.43	4/15/2024	2.62
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	4/16/2024	2.2
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.45	4/17/2024	2.67
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.45	5/21/2024	2.13
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	6/18/2024	1.91
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.48	7/15/2024	2.02
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.45	7/16/2024	1.83
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.44	7/17/2024	2.3

Biosolids: Durham Water Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	8/14/2024	2.04
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.49	9/10/2024	2.52
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.5	10/14/2024	2.14
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.46	10/15/2024	2.98
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.44	10/16/2024	2.16
Durham Centrifuge Cake	Silver	ICP/MS Metals, Dry	0.47	11/11/2024	2.7
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	1/2/2024	580
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	2/12/2024	695
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	2/13/2024	693
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	2/14/2024	614
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	3/11/2024	617
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	4/15/2024	704
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	4/16/2024	693
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	4/17/2024	699
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	5/21/2024	657
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	6/18/2024	619
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	7/15/2024	701
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	7/16/2024	650
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	7/17/2024	714
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	8/14/2024	640
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	9/10/2024	768
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	10/14/2024	653
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	10/15/2024	681
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	11	10/16/2024	656
Durham Centrifuge Cake	Zinc	ICP/MS Metals, Dry	12	11/11/2024	769

Form 3 – Treatment Plant Monitoring Data – Rock Creek

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	81.71	78.56	µg/L	NA	0.970			0.64	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	84.60	83.67	µg/L	1.23	0.907	26%	0.87	0.63	27%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	73.35	72.30	µg/L	1.36	1.03	24%	0.83	0.62	25%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	64.21	63.17	µg/L	1.44	1.09	24%	0.77	0.57	26%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	46.84	42.63	µg/L	NA	1.09			0.39	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	58.18	57.03	µg/L	NA	1.14			0.54	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	41.09	36.04	µg/L	NA	1.04			0.31	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	39.14	34.23	µg/L	NA	1.19			0.34	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	39.70	35.34	µg/L	1.41	1.02	28%	0.47	0.30	36%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	36.53	32.40	µg/L	1.60	1.06	34%	0.49	0.29	41%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	36.21	31.43	µg/L	1.74	1.14	34%	0.53	0.30	43%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	5/7/2024	50.38	45.43	µg/L	NA	0.870			0.33	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	38.40	33.82	µg/L	NA	1.12			0.32	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	35.13	28.88	µg/L	NA	0.844			0.20	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	28.58	24.08	µg/L	2.26	0.869	62%	0.54	0.17	68%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	28.77	24.55	µg/L	2.31	0.815	65%	0.55	0.17	70%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	28.43	24.48	µg/L	2.38	0.886	63%	0.56	0.18	68%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/6/2024	34.56	27.09	µg/L	1.40	1.15	18%	0.40	0.26	36%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/7/2024	33.13	26.13	µg/L	1.99	1.35	32%	0.55	0.29	46%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/8/2024	32.80	25.99	µg/L	2.13	1.34	37%	0.58	0.29	50%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	81.71	78.56	µg/L	NA	< 0.102			0.067	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	84.60	83.67	µg/L	0.117	< 0.102	57%	0.083	0.071	14%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	73.35	72.30	µg/L	< 0.102	< 0.102		0.062	0.062	1%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	64.21	63.17	µg/L	< 0.102	< 0.102		0.055	0.054	2%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	46.84	42.63	µg/L	NA	< 0.102			0.036	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	58.18	57.03	µg/L	NA	< 0.102			0.049	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	41.09	36.04	µg/L	NA	< 0.102			0.031	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	39.14	34.23	µg/L	NA	< 0.102			0.029	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	39.70	35.34	µg/L	0.128	< 0.102	60%	0.042	0.030	29%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	36.53	32.40	µg/L	< 0.102	< 0.102		0.031	0.028	11%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	36.21	31.43	µg/L	0.111	< 0.102	54%	0.034	0.027	20%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	5/7/2024	50.38	45.43	µg/L	NA	< 0.102			0.039	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	38.40	33.82	µg/L	NA	< 0.102			0.029	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	35.13	28.88	µg/L	NA	< 0.102			0.025	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	28.58	24.08	µg/L	0.166	< 0.102	69%	0.040	0.020	48%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	28.77	24.55	µg/L	0.127	< 0.102	60%	0.030	0.021	31%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	28.43	24.48	µg/L	0.170	< 0.102	70%	0.040	0.021	48%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	34.56	27.09	µg/L	0.118	< 0.102	57%	0.034	0.023	32%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	33.13	26.13	µg/L	0.137	< 0.102	63%	0.038	0.022	41%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	32.80	25.99	µg/L	0.150	< 0.102	66%	0.041	0.022	46%
Chromium	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	81.71	78.56	µg/L	NA	0.418			0.27	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	84.60	83.67	µg/L	1.67	0.488	71%	1.2	0.34	71%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	73.35	72.30	µg/L	1.80	0.468	74%	1.1	0.28	74%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	64.21	63.17	µg/L	1.92	0.470	76%	1.0	0.25	76%
Chromium	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	46.84	42.63	µg/L	NA	0.607			0.22	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	58.18	57.03	µg/L	NA	0.569			0.27	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	41.09	36.04	µg/L	NA	0.546			0.16	
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	39.14	34.23	µg/L	NA	0.701			0.20	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	39.70	35.34	µg/L	1.84	0.453	75%	0.61	0.13	78%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	36.53	32.40	µg/L	1.85	0.542	71%	0.56	0.15	74%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	36.21	31.43	µg/L	2.05	0.567	72%	0.62	0.15	76%
Chromium	ICP/MS Metals, Total Recoverable		0.406	5/7/2024	50.38	45.43	µg/L	NA	0.452			0.17	
Chromium	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	38.40	33.82	µg/L	NA	< 0.406			0.11	
Chromium	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	35.13	28.88	µg/L	NA	0.406			0.098	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	28.58	24.08	µg/L	2.33	< 0.406	91%	0.56	0.082	85%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	28.77	24.55	µg/L	2.32	< 0.406	91%	0.56	0.083	85%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	28.43	24.48	µg/L	2.38	0.548	77%	0.56	0.11	80%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	34.56	27.09	µg/L	1.27	< 0.406	84%	0.37	0.092	75%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	33.13	26.13	µg/L	2.13	0.472	78%	0.59	0.10	83%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	32.80	25.99	µg/L	2.41	0.571	76%	0.66	0.12	81%
Copper	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	81.71	78.56	µg/L	NA	1.58			1.0	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	84.60	83.67	µg/L	15.5	3.40	78%	11	2.4	78%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	73.35	72.30	µg/L	19.5	1.71	91%	12	1.0	91%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	64.21	63.17	µg/L	20.5	1.31	94%	11	0.69	94%
Copper	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	46.84	42.63	µg/L	NA	1.65			0.59	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	58.18	57.03	µg/L	NA	1.84			0.88	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	41.09	36.04	µg/L	NA	2.33			0.70	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	39.14	34.23	µg/L	NA	2.26			0.65	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	39.70	35.34	µg/L	33.3	1.61	95%	11	0.47	96%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	36.53	32.40	µg/L	31.3	1.68	95%	9.5	0.45	95%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	36.21	31.43	µg/L	51.0	1.84	96%	15	0.48	97%
Copper	ICP/MS Metals, Total Recoverable		0.406	5/7/2024	50.38	45.43	µg/L	NA	1.40			0.53	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/9/2024	44.29	39.43	µg/L	NA	0.986			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/12/2024	40.49	35.31	µg/L	NA	1.40			0.41	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	38.40	33.82	µg/L	NA	1.68			0.47	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/16/2024	37.98	30.69	µg/L	NA	1.35			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/19/2024	41.04	35.33	µg/L	NA	1.21			0.36	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/23/2024	38.13	32.73	µg/L	NA	1.18			0.32	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/26/2024	35.14	30.06	µg/L	NA	1.34			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/28/2024	35.84	30.58	µg/L	NA	1.66			0.42	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/30/2024	37.03	31.18	µg/L	NA	E 1.42			0.37	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/2/2024	43.61	37.66	µg/L	NA	1.79			0.56	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/4/2024	41.09	35.53	µg/L	NA	1.36			0.40	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/6/2024	37.28	31.64	µg/L	NA	1.36			0.36	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/9/2024	36.86	30.73	µg/L	NA	1.64			0.42	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	35.13	28.88	µg/L	NA	1.86			0.45	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/13/2024	35.55	29.56	µg/L	NA	1.25			0.31	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/16/2024	35.50	30.76	µg/L	NA	1.37			0.35	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/18/2024	34.23	30.43	µg/L	NA	1.34			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/20/2024	32.63	28.82	µg/L	NA	1.24			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/23/2024	32.63	28.06	µg/L	NA	1.28			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/25/2024	30.56	26.68	µg/L	NA	1.34			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/27/2024	30.48	26.26	µg/L	NA	1.26			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/30/2024	31.44	27.33	µg/L	NA	1.25			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/2/2024	30.13	26.07	µg/L	NA	1.31			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/4/2024	28.84	24.64	µg/L	NA	1.25			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/7/2024	29.45	24.67	µg/L	NA	1.43			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/9/2024	28.50	23.97	µg/L	NA	1.53			0.31	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	28.58	24.08	µg/L	58.7	1.49	98%	14	0.30	98%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	28.77	24.55	µg/L	47.5	1.53	97%	11	0.31	97%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	28.43	24.48	µg/L	50.3	1.46	97%	12	0.30	98%
Copper	ICP/MS Metals, Total Recoverable		0.406	7/18/2024	28.30	24.06	µg/L	NA	1.41			0.28	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable		0.406	7/21/2024	29.20	24.80	µg/L	NA	1.31			0.27	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/23/2024	28.67	24.30	µg/L	NA	1.42			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/25/2024	28.70	23.41	µg/L	NA	1.37			0.27	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/28/2024	28.31	24.13	µg/L	NA	1.30			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/30/2024	28.61	24.52	µg/L	NA	1.35			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/1/2024	27.72	23.93	µg/L	NA	1.40			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/4/2024	29.93	25.37	µg/L	NA	1.29			0.27	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/6/2024	29.47	25.45	µg/L	NA	1.45			0.31	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/8/2024	30.65	25.50	µg/L	NA	1.24			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/11/2024	29.67	24.80	µg/L	NA	1.22			0.25	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/15/2024	28.61	23.12	µg/L	NA	1.28			0.25	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/18/2024	31.18	25.87	µg/L	NA	1.00			0.22	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/20/2024	28.02	22.90	µg/L	NA	1.30			0.25	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/22/2024	30.27	24.67	µg/L	NA	0.989			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/25/2024	30.50	26.20	µg/L	NA	1.04			0.23	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/27/2024	32.31	23.64	µg/L	NA	0.979			0.19	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/29/2024	31.43	23.54	µg/L	NA	0.812			0.16	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/1/2024	29.82	22.58	µg/L	NA	1.16			0.22	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	31.98	23.88	µg/L	NA	1.51			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/5/2024	29.74	22.34	µg/L	NA	1.42			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/8/2024	31.57	24.67	µg/L	NA	1.36			0.28	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/10/2024	29.65	21.71	µg/L	NA	1.46			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/12/2024	31.33	25.47	µg/L	NA	1.23			0.26	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/15/2024	31.07	24.69	µg/L	NA	1.22			0.25	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	31.54	24.57	µg/L	NA	1.59			0.33	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/19/2024	30.28	23.95	µg/L	NA	1.51			0.30	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/22/2024	30.35	24.07	µg/L	NA	1.79			0.36	
Copper	ICP/MS Metals, Total Recoverable		0.406	10/1/2024	33.17	26.14	µg/L	NA	2.36			0.51	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	34.56	27.09	µg/L	33.3	2.69	92%	9.6	0.61	94%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	33.13	26.13	µg/L	62.3	2.93	95%	17	0.64	96%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	32.80	25.99	µg/L	59.4	2.93	95%	16	0.64	96%
Copper	ICP/MS Metals, Total Recoverable		0.406	11/26/2024	50.69	44.26	µg/L	NA	1.80			0.66	
Copper	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	38.40	31.26	µg/L	NA	2.09			0.54	
Cyanide	Cyanide, Total	1	1	1/29/2024	73.35	72.30	µg/L	1.32	1.20	9%	0.81	0.72	10%
Cyanide	Cyanide, Total	1	1	1/30/2024	64.21	63.17	µg/L	1.24	1.32	-7%	0.66	0.70	-5%

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cyanide	Cyanide, Total	1	1	1/31/2024	59.38	58.37	µg/L	1.40	1.42	-1%	0.69	0.69	0%
Cyanide	Cyanide, Total	1	1	4/8/2024	36.53	32.40	µg/L	1.60	1.79	-12%	0.49	0.48	1%
Cyanide	Cyanide, Total	1	1	4/9/2024	36.21	31.43	µg/L	2.04	1.75	14%	0.62	0.46	26%
Cyanide	Cyanide, Total	1	1	4/10/2024	35.14	30.64	µg/L	1.96	1.91	3%	0.57	0.49	15%
Cyanide	Cyanide, Total	1	1	7/15/2024	28.77	24.55	µg/L	3.93	1.96	50%	0.94	0.40	57%
Cyanide	Cyanide, Total	1	1	7/16/2024	28.43	24.48	µg/L	3.30	2.12	36%	0.78	0.43	45%
Cyanide	Cyanide, Total	1	1	7/17/2024	27.20	23.96	µg/L	3.76	1.95	48%	0.85	0.39	54%
Cyanide	Cyanide, Total	1	1	10/7/2024	33.13	26.13	µg/L	2.39	1.73	28%	0.66	0.38	43%
Cyanide	Cyanide, Total	1	1	10/8/2024	32.80	25.99	µg/L	4.40	2.01	54%	1.2	0.44	64%
Cyanide	Cyanide, Total	1	1	10/9/2024	33.32	25.71	µg/L	3.69	2.03	45%	1.0	0.44	58%
Hardness	ICP/MS Metals, Total Recoverable		0.5	1/9/2024	81.71	78.56	mg/L	NA	109			71000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/28/2024	84.60	83.67	mg/L	95.0	103	-8%	67000	72000	-7%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/29/2024	73.35	72.30	mg/L	109	114	-5%	67000	69000	-3%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/30/2024	64.21	63.17	mg/L	100	113	-13%	54000	60000	-11%
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/6/2024	46.84	42.63	mg/L	NA	111			39000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/20/2024	49.55	45.65	mg/L	NA	102			39000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/5/2024	58.18	57.03	mg/L	NA	114			54000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/18/2024	41.09	36.04	mg/L	NA	119			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/2/2024	39.14	34.23	mg/L	NA	108			31000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/7/2024	39.70	35.34	mg/L	122	111	9%	40000	33000	19%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/8/2024	36.53	32.40	mg/L	120	107	11%	37000	29000	21%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/9/2024	36.21	31.43	mg/L	115	103	10%	35000	27000	22%
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/16/2024	36.12	30.59	mg/L	NA	111			28000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/2/2024	49.09	44.20	mg/L	NA	115			42000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/5/2024	63.53	58.85	mg/L	NA	108			53000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/7/2024	50.38	45.43	mg/L	NA	102			39000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/9/2024	44.29	39.43	mg/L	NA	99.7			33000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/12/2024	40.49	35.31	mg/L	NA	128			38000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/14/2024	38.40	33.82	mg/L	NA	144			41000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/16/2024	37.98	30.69	mg/L	NA	139			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/19/2024	41.04	35.33	mg/L	NA	127			37000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/23/2024	38.13	32.73	mg/L	NA	130			35000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/26/2024	35.14	30.06	mg/L	NA	128			32000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/28/2024	35.84	30.58	mg/L	NA	131			33000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/30/2024	37.03	31.18	mg/L	NA	E 132			34000	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/2/2024	43.61	37.66	mg/L	NA	133			42000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/4/2024	41.09	35.53	mg/L	NA	138			41000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/6/2024	37.28	31.64	mg/L	NA	139			37000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/9/2024	36.86	30.73	mg/L	NA	141			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/11/2024	35.13	28.88	mg/L	NA	142			34000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/13/2024	35.55	29.56	mg/L	NA	141			35000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/16/2024	35.50	30.76	mg/L	NA	140			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/18/2024	34.23	30.43	mg/L	NA	141			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/20/2024	32.63	28.82	mg/L	NA	145			35000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/23/2024	32.63	28.06	mg/L	NA	150			35000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/25/2024	30.56	26.68	mg/L	NA	147			33000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/27/2024	30.48	26.26	mg/L	NA	138			30000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/30/2024	31.44	27.33	mg/L	NA	141			32000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/2/2024	30.13	26.07	mg/L	NA	131			28000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/4/2024	28.84	24.64	mg/L	NA	129			27000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/7/2024	29.45	24.67	mg/L	NA	125			26000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/9/2024	28.50	23.97	mg/L	NA	116			23000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/14/2024	28.58	24.08	mg/L	110	124	-13%	26000	25000	5%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/15/2024	28.77	24.55	mg/L	122	132	-8%	29000	27000	8%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/16/2024	28.43	24.48	mg/L	124	135	-9%	29000	28000	6%
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/18/2024	28.30	24.06	mg/L	NA	125			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/21/2024	29.20	24.80	mg/L	NA	128			26000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/23/2024	28.67	24.30	mg/L	NA	119			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/25/2024	28.70	23.41	mg/L	NA	132			26000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/28/2024	28.31	24.13	mg/L	NA	125			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/30/2024	28.61	24.52	mg/L	NA	123			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/1/2024	27.72	23.93	mg/L	NA	125			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/4/2024	29.93	25.37	mg/L	NA	123			26000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/6/2024	29.47	25.45	mg/L	NA	131			28000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/8/2024	30.65	25.50	mg/L	NA	134			28000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/11/2024	29.67	24.80	mg/L	NA	152			31000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/15/2024	28.61	23.12	mg/L	NA	139			27000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/18/2024	31.18	25.87	mg/L	NA	116			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/20/2024	28.02	22.90	mg/L	NA	130			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/22/2024	30.27	24.67	mg/L	NA	139			29000	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/25/2024	30.50	26.20	mg/L	NA	136			30000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/27/2024	32.31	23.64	mg/L	NA	147			29000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/29/2024	31.43	23.54	mg/L	NA	127			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/1/2024	29.82	22.58	mg/L	NA	144			27000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/3/2024	31.98	23.88	mg/L	NA	127			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/5/2024	29.74	22.34	mg/L	NA	141			26000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/8/2024	31.57	24.67	mg/L	NA	143			29000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/10/2024	29.65	21.71	mg/L	NA	128			23000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/12/2024	31.33	25.47	mg/L	NA	127			27000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/15/2024	31.07	24.69	mg/L	NA	140			29000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/17/2024	31.54	24.57	mg/L	NA	124			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/19/2024	30.28	23.95	mg/L	NA	127			25000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/22/2024	30.35	24.07	mg/L	NA	119			24000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/1/2024	33.17	26.14	mg/L	NA	116			25000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/6/2024	34.56	27.09	mg/L	95.3	113	-19%	27000	26000	7%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/7/2024	33.13	26.13	mg/L	94.9	114	-20%	26000	25000	5%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	10/8/2024	32.80	25.99	mg/L	92.4	116	-26%	25000	25000	1%
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/22/2024	34.15	27.01	mg/L	NA	142			32000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/12/2024	46.69	40.61	mg/L	NA	106			36000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/26/2024	50.69	44.26	mg/L	NA	102			38000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/3/2024	38.40	31.26	mg/L	NA	115			30000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/17/2024	74.35	65.09	mg/L	NA	109			59000	
Lead	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	81.71	78.56	µg/L	NA	< 0.102			0.067	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	84.60	83.67	µg/L	0.640	< 0.102	92%	0.45	0.071	84%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	73.35	72.30	µg/L	0.643	< 0.102	92%	0.39	0.062	84%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	64.21	63.17	µg/L	0.537	< 0.102	90%	0.29	0.054	81%
Lead	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	46.84	42.63	µg/L	NA	< 0.102			0.036	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	58.18	57.03	µg/L	NA	< 0.102			0.049	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	41.09	36.04	µg/L	NA	< 0.102			0.031	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	39.14	34.23	µg/L	NA	0.106			0.030	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	39.70	35.34	µg/L	0.878	< 0.102	94%	0.29	0.030	90%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	36.53	32.40	µg/L	0.691	0.131	81%	0.21	0.035	83%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	36.21	31.43	µg/L	1.69	< 0.102	97%	0.51	0.027	95%
Lead	ICP/MS Metals, Total Recoverable		0.1015	5/7/2024	50.38	45.43	µg/L	NA	< 0.102			0.039	
Lead	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	38.40	33.82	µg/L	NA	0.189			0.053	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Lead	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	35.13	28.88	µg/L	NA	0.120			0.029	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	28.58	24.08	µg/L	1.59	0.130	92%	0.38	0.026	93%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	28.77	24.55	µg/L	1.02	0.138	86%	0.24	0.028	88%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	28.43	24.48	µg/L	1.37	0.133	90%	0.32	0.027	92%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	34.56	27.09	µg/L	0.929	0.115	88%	0.27	0.026	90%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	33.13	26.13	µg/L	1.54	0.116	92%	0.43	0.025	94%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	32.80	25.99	µg/L	1.58	0.124	92%	0.43	0.027	94%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/28/2024	84.60	83.67	ng/L	11.4	1.47	87%	0.0080	0.0010	87%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/29/2024	73.35	72.30	ng/L	12.6	0.874	93%	0.0077	0.00053	93%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/30/2024	64.21	63.17	ng/L	17.3	0.786	96%	0.0093	0.00041	96%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/7/2024	39.70	35.34	ng/L	21.0	0.659	97%	0.0070	0.00019	97%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/8/2024	36.53	32.40	ng/L	24.7	0.642	97%	0.0075	0.00017	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/9/2024	36.21	31.43	ng/L	27.6	0.692	98%	0.0083	0.00018	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/14/2024	28.58	24.08	ng/L	62.7	0.524	99%	0.015	0.00011	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/15/2024	28.77	24.55	ng/L	77.6	0.428	99%	0.019	0.000088	100%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/16/2024	28.43	24.48	ng/L	40.7	0.454	99%	0.0097	0.000093	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/6/2024	34.56	27.09	ng/L	30.2	0.822	97%	0.0087	0.00019	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/7/2024	33.13	26.13	ng/L	44.1	0.676	98%	0.012	0.00015	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	10/8/2024	32.80	25.99	ng/L	37.9	0.619	98%	0.010	0.00013	99%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	81.71	78.56	µg/L	NA	2.49			1.6	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	84.60	83.67	µg/L	2.58	2.02	22%	1.8	1.4	23%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	73.35	72.30	µg/L	13.9	6.14	56%	8.5	3.7	56%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	64.21	63.17	µg/L	4.50	5.59	-24%	2.4	2.9	-22%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	46.84	42.63	µg/L	NA	4.13			1.5	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	58.18	57.03	µg/L	NA	2.84			1.4	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	41.09	36.04	µg/L	NA	1.58			0.47	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	39.14	34.23	µg/L	NA	3.76			1.1	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	39.70	35.34	µg/L	1.64	1.16	29%	0.54	0.34	37%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	36.53	32.40	µg/L	1.88	1.07	43%	0.57	0.29	50%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	36.21	31.43	µg/L	1.66	1.07	36%	0.50	0.28	44%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	5/7/2024	50.38	45.43	µg/L	NA	1.17			0.44	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	38.40	33.82	µg/L	NA	1.33			0.38	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	35.13	28.88	µg/L	NA	2.74			0.66	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	28.58	24.08	µg/L	2.52	1.41	44%	0.60	0.28	53%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	28.77	24.55	µg/L	2.73	1.65	40%	0.66	0.34	48%

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	28.43	24.48	µg/L	2.56	1.69	34%	0.61	0.35	43%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	34.56	27.09	µg/L	1.51	1.05	30%	0.44	0.24	45%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	33.13	26.13	µg/L	1.76	1.06	40%	0.49	0.23	52%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	32.80	25.99	µg/L	2.08	1.26	39%	0.57	0.27	52%
Nickel	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	81.71	78.56	µg/L	NA	1.30			0.85	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	84.60	83.67	µg/L	4.63	1.14	75%	3.3	0.80	76%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	73.35	72.30	µg/L	3.58	1.15	68%	2.2	0.69	68%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	64.21	63.17	µg/L	4.19	1.23	71%	2.2	0.65	71%
Nickel	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	46.84	42.63	µg/L	NA	1.72			0.61	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	58.18	57.03	µg/L	NA	1.48			0.70	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	41.09	36.04	µg/L	NA	1.82			0.55	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	39.14	34.23	µg/L	NA	2.48			0.71	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	39.70	35.34	µg/L	5.32	1.96	63%	1.8	0.58	67%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	36.53	32.40	µg/L	4.46	1.81	59%	1.4	0.49	64%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	36.21	31.43	µg/L	7.10	1.92	73%	2.1	0.50	77%
Nickel	ICP/MS Metals, Total Recoverable		0.406	5/7/2024	50.38	45.43	µg/L	NA	1.62			0.61	
Nickel	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	38.40	33.82	µg/L	NA	2.79			0.79	
Nickel	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	35.13	28.88	µg/L	NA	2.20			0.53	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	28.58	24.08	µg/L	6.26	2.65	58%	1.5	0.53	64%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	28.77	24.55	µg/L	5.04	2.30	54%	1.2	0.47	61%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	28.43	24.48	µg/L	5.71	2.38	58%	1.4	0.49	64%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/6/2024	34.56	27.09	µg/L	7.60	2.09	72%	2.2	0.47	78%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/7/2024	33.13	26.13	µg/L	5.19	2.14	59%	1.4	0.47	67%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	10/8/2024	32.80	25.99	µg/L	7.68	2.58	66%	2.1	0.56	73%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	81.71	78.56	µg/L	NA	< 0.508			0.33	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	84.60	83.67	µg/L	< 0.508	< 0.508		0.36	0.35	1%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	73.35	72.30	µg/L	< 0.508	< 0.508		0.31	0.31	1%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	64.21	63.17	µg/L	< 0.508	< 0.508		0.27	0.27	2%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	46.84	42.63	µg/L	NA	< 0.508			0.18	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	58.18	57.03	µg/L	NA	< 0.508			0.24	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	41.09	36.04	µg/L	NA	< 0.508			0.15	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	39.14	34.23	µg/L	NA	< 0.508			0.15	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	39.70	35.34	µg/L	< 0.508	< 0.508		0.17	0.15	11%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	36.53	32.40	µg/L	< 0.508	< 0.508		0.15	0.14	11%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	36.21	31.43	µg/L	< 0.508	< 0.508		0.15	0.13	13%

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Selenium	ICP/MS Metals, Total Recoverable		0.5075	5/7/2024	50.38	45.43	µg/L	NA	< 0.508			0.19	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	38.40	33.82	µg/L	NA	< 0.508			0.14	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	35.13	28.88	µg/L	NA	< 0.508			0.12	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	28.58	24.08	µg/L	< 0.508	< 0.508		0.12	0.10	16%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	28.77	24.55	µg/L	0.550	< 0.508	54%	0.13	0.10	21%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	28.43	24.48	µg/L	0.605	< 0.508	58%	0.14	0.10	28%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/6/2024	34.56	27.09	µg/L	< 0.508	< 0.508		0.15	0.11	22%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/7/2024	33.13	26.13	µg/L	< 0.508	< 0.508		0.14	0.11	21%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	10/8/2024	32.80	25.99	µg/L	0.641	< 0.508	60%	0.18	0.11	37%
Silver	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	81.71	78.56	µg/L	NA	< 0.102			0.067	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	84.60	83.67	µg/L	< 0.102	< 0.102		0.072	0.071	1%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	73.35	72.30	µg/L	< 0.102	< 0.102		0.062	0.062	1%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	64.21	63.17	µg/L	< 0.102	< 0.102		0.055	0.054	2%
Silver	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	46.84	42.63	µg/L	NA	< 0.102			0.036	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	58.18	57.03	µg/L	NA	< 0.102			0.049	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	41.09	36.04	µg/L	NA	< 0.102			0.031	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	39.14	34.23	µg/L	NA	< 0.102			0.029	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	39.70	35.34	µg/L	0.207	< 0.102	76%	0.069	0.030	56%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	36.53	32.40	µg/L	0.138	< 0.102	63%	0.042	0.028	34%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	36.21	31.43	µg/L	0.180	< 0.102	72%	0.054	0.027	51%
Silver	ICP/MS Metals, Total Recoverable		0.1015	5/7/2024	50.38	45.43	µg/L	NA	< 0.102			0.039	
Silver	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	38.40	33.82	µg/L	NA	< 0.102			0.029	
Silver	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	35.13	28.88	µg/L	NA	< 0.102			0.025	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	28.58	24.08	µg/L	0.221	< 0.102	77%	0.053	0.020	61%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	28.77	24.55	µg/L	0.256	< 0.102	80%	0.061	0.021	66%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	28.43	24.48	µg/L	0.243	< 0.102	79%	0.058	0.021	64%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/6/2024	34.56	27.09	µg/L	0.169	< 0.102	70%	0.049	0.023	53%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/7/2024	33.13	26.13	µg/L	0.207	< 0.102	76%	0.057	0.022	61%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	10/8/2024	32.80	25.99	µg/L	0.252	< 0.102	80%	0.069	0.022	68%
Zinc	ICP/MS Metals, Total Recoverable		2.537	1/9/2024	81.71	78.56	µg/L	NA	22.1			14	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/28/2024	84.60	83.67	µg/L	158	23.2	85%	110	16	85%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/29/2024	73.35	72.30	µg/L	123	22.8	82%	75	14	82%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/30/2024	64.21	63.17	µg/L	107	21.7	80%	57	11	80%
Zinc	ICP/MS Metals, Total Recoverable		2.537	2/6/2024	46.84	42.63	µg/L	NA	21.4			7.6	
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/5/2024	58.18	57.03	µg/L	NA	28.2			13	

Influent-Effluent Metals & Cyanide: Rock Creek Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/18/2024	41.09	36.04	µg/L	NA	28.1			8.4	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/2/2024	39.14	34.23	µg/L	NA	30.7			8.8	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/7/2024	39.70	35.34	µg/L	127	50.5	60%	42	15	65%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/8/2024	36.53	32.40	µg/L	105	31.1	70%	32	8.4	74%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/9/2024	36.21	31.43	µg/L	154	30.1	80%	47	7.9	83%
Zinc	ICP/MS Metals, Total Recoverable		2.537	5/7/2024	50.38	45.43	µg/L	NA	28.1			11	
Zinc	ICP/MS Metals, Total Recoverable		2.537	5/14/2024	38.40	33.82	µg/L	NA	37.8			11	
Zinc	ICP/MS Metals, Total Recoverable		2.537	6/11/2024	35.13	28.88	µg/L	NA	29.8			7.2	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/14/2024	28.58	24.08	µg/L	219	42.3	81%	52	8.5	84%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/15/2024	28.77	24.55	µg/L	155	41.3	73%	37	8.5	77%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/16/2024	28.43	24.48	µg/L	169	42.6	75%	40	8.7	78%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/6/2024	34.56	27.09	µg/L	124	46.3	63%	36	10	71%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/7/2024	33.13	26.13	µg/L	152	37.7	75%	42	8.2	80%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	10/8/2024	32.80	25.99	µg/L	162	35.0	78%	44	7.6	83%

Form 3 – Treatment Plant Monitoring Data – Rock Creek Biosolids

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.2	1/2/2024	3.6
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.2	2/12/2024	4.49
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.3	2/13/2024	4.23
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.1	2/14/2024	4.45
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.2	3/12/2024	3.82
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.2	4/16/2024	4.61
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.2	4/17/2024	4.65
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.3	4/18/2024	4.88
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.3	5/21/2024	5.23
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.5	6/18/2024	5.99
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.6	7/16/2024	6.88
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.5	7/17/2024	6.98
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.6	7/18/2024	6.67
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.3	8/13/2024	6.84
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.3	9/10/2024	7.04
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.4	10/14/2024	7.43
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.4	10/15/2024	7.25
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.5	10/16/2024	7.35
Rock Creek Cake	Arsenic	ICP/MS Metals, Dry	2.5	11/12/2024	6.18
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.44	1/2/2024	0.782
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.45	2/12/2024	0.905
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.46	2/13/2024	0.788
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.43	2/14/2024	0.887
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.43	3/12/2024	0.749
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.45	4/16/2024	0.93
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.45	4/17/2024	0.897
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.46	4/18/2024	0.928
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.45	5/21/2024	0.77
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.49	6/18/2024	0.783
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.51	7/16/2024	0.884
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.5	7/17/2024	0.811
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.53	7/18/2024	0.893
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.45	8/13/2024	0.808
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.46	9/10/2024	0.742

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.48	10/14/2024	0.862
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.47	10/15/2024	0.881
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.5	10/16/2024	0.858
Rock Creek Cake	Cadmium	ICP/MS Metals, Dry	0.51	11/12/2024	0.872
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.7	1/2/2024	22.2
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	2/12/2024	28.5
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	2/13/2024	27.5
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.7	2/14/2024	29.1
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.7	3/12/2024	23.2
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	4/16/2024	25.1
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	4/17/2024	25.6
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	4/18/2024	26.2
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	5/21/2024	22.7
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2	6/18/2024	18.9
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2.1	7/16/2024	20.9
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2	7/17/2024	21.2
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2.1	7/18/2024	20
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	8/13/2024	20.8
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.8	9/10/2024	20.7
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.9	10/14/2024	21.4
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	1.9	10/15/2024	21.3
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2	10/16/2024	21.8
Rock Creek Cake	Chromium	ICP/MS Metals, Dry	2	11/12/2024	21.8
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.7	1/2/2024	260
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	2/12/2024	284
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	2/13/2024	254
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.7	2/14/2024	276
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.7	3/12/2024	251
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	4/16/2024	329
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	4/17/2024	329
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	4/18/2024	337
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	5/21/2024	278
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2	6/18/2024	256
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2.1	7/16/2024	299
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2	7/17/2024	299
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2.1	7/18/2024	294
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	8/13/2024	312

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.8	9/10/2024	291
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.9	10/14/2024	307
Rock Creek Cake	Copper	ICP/MS Metals, Dry	1.9	10/15/2024	318
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2	10/16/2024	315
Rock Creek Cake	Copper	ICP/MS Metals, Dry	2	11/12/2024	314
Rock Creek Cake	Cyanide	Cyanide, Dry	0	2/12/2024	9.64
Rock Creek Cake	Cyanide	Cyanide, Dry	0	2/13/2024	10.1
Rock Creek Cake	Cyanide	Cyanide, Dry	0	2/14/2024	10.4
Rock Creek Cake	Cyanide	Cyanide, Dry	2.2	4/16/2024	4.93
Rock Creek Cake	Cyanide	Cyanide, Dry	2.3	4/17/2024	5
Rock Creek Cake	Cyanide	Cyanide, Dry	2.3	4/18/2024	5.08
Rock Creek Cake	Cyanide	Cyanide, Dry	2.5	7/16/2024	10.6
Rock Creek Cake	Cyanide	Cyanide, Dry	2.5	7/17/2024	11.5
Rock Creek Cake	Cyanide	Cyanide, Dry	2.4	7/18/2024	10.7
Rock Creek Cake	Cyanide	Cyanide, Dry	2.3	10/14/2024	9.2
Rock Creek Cake	Cyanide	Cyanide, Dry	2.4	10/15/2024	10.1
Rock Creek Cake	Cyanide	Cyanide, Dry	2.4	10/16/2024	10.4
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	1/2/2024	49200
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	2/12/2024	62300
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	2/13/2024	56800
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	2/14/2024	60100
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	3/12/2024	56700
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	4/16/2024	66500
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	4/17/2024	70800
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	4/18/2024	64300
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	5/21/2024	63200
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	6/18/2024	69700
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	7/16/2024	76900
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	7/17/2024	76200
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	7/18/2024	73000
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	8/13/2024	71400
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	9/10/2024	70800
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	10/14/2024	79400
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	10/15/2024	78600
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	10/16/2024	75100
Rock Creek Cake	Hardness	ICP/MS Metals, Dry	0	11/12/2024	74200
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.44	1/2/2024	6.01

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.45	2/12/2024	7.4
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.46	2/13/2024	6.63
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.43	2/14/2024	7.2
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.43	3/12/2024	6.17
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.45	4/16/2024	6.88
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.45	4/17/2024	7.21
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.46	4/18/2024	7.66
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.45	5/21/2024	6.23
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.49	6/18/2024	5.24
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.51	7/16/2024	7.18
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.5	7/17/2024	6.33
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.53	7/18/2024	6.22
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.45	8/13/2024	6.01
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.46	9/10/2024	5.34
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.48	10/14/2024	6.06
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.47	10/15/2024	7.03
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.5	10/16/2024	6.3
Rock Creek Cake	Lead	ICP/MS Metals, Dry	0.51	11/12/2024	7.35
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.087	1/2/2024	0.287
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.089	2/12/2024	0.33
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.091	2/13/2024	0.359
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.086	2/14/2024	0.321
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.086	3/12/2024	0.466
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.09	4/16/2024	0.249
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.089	4/17/2024	0.378
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.091	4/18/2024	0.274
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.09	5/21/2024	0.261
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.098	6/18/2024	0.287
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.1	7/16/2024	0.466
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.1	7/17/2024	0.271
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.11	7/18/2024	0.308
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.091	8/13/2024	0.395
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.091	9/10/2024	0.37
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.096	10/14/2024	0.419
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.095	10/15/2024	0.311
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.099	10/16/2024	0.534
Rock Creek Cake	Mercury	ICP/MS Metals, Dry	0.1	11/12/2024	0.315

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.44	1/2/2024	8.96
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.45	2/12/2024	9.81
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.46	2/13/2024	9.49
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.43	2/14/2024	9.9
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.43	3/12/2024	7.89
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.45	4/16/2024	7.86
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.45	4/17/2024	7.68
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.46	4/18/2024	8.2
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.45	5/21/2024	8.42
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.49	6/18/2024	7.29
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.51	7/16/2024	7.79
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.5	7/17/2024	8.21
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.53	7/18/2024	8.46
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.45	8/13/2024	7.51
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.46	9/10/2024	8.1
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.48	10/14/2024	7.65
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.47	10/15/2024	7.67
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.5	10/16/2024	7.75
Rock Creek Cake	Molybdenum	ICP/MS Metals, Dry	0.51	11/12/2024	8.17
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.7	1/2/2024	21.9
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	2/12/2024	22.2
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	2/13/2024	20.5
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.7	2/14/2024	23
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.7	3/12/2024	17.8
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	4/16/2024	19.8
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	4/17/2024	19.5
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	4/18/2024	20.4
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	5/21/2024	25.7
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2	6/18/2024	19.1
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2.1	7/16/2024	18.2
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2	7/17/2024	19.3
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2.1	7/18/2024	18.2
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	8/13/2024	18.3
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.8	9/10/2024	17.5
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.9	10/14/2024	19.7
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	1.9	10/15/2024	19.4
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2	10/16/2024	25.1

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Nickel	ICP/MS Metals, Dry	2	11/12/2024	24
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.2	1/2/2024	4.86
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.2	2/12/2024	5.93
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.3	2/13/2024	5.41
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.1	2/14/2024	5.99
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.2	3/12/2024	4.71
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.2	4/16/2024	5.83
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.2	4/17/2024	6.04
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.3	4/18/2024	5.92
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.3	5/21/2024	5.4
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.5	6/18/2024	4.99
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.6	7/16/2024	5.84
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.5	7/17/2024	5.56
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.6	7/18/2024	5.5
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.3	8/13/2024	5.49
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.3	9/10/2024	5.44
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.4	10/14/2024	5.76
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.4	10/15/2024	6.45
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.5	10/16/2024	5.88
Rock Creek Cake	Selenium	ICP/MS Metals, Dry	2.5	11/12/2024	6
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.44	1/2/2024	1.7
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.45	2/12/2024	1.83
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.46	2/13/2024	1.45
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.43	2/14/2024	1.53
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.44	4/16/2024	2.34
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.44	4/17/2024	2.01
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.47	4/18/2024	1.53
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.45	5/21/2024	2.04
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.49	6/18/2024	1.76
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.51	7/16/2024	2.01
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.5	7/17/2024	2.17
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.53	7/18/2024	1.77
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.45	8/13/2024	1.76
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.46	9/10/2024	1.63
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.48	10/14/2024	1.81
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.47	10/15/2024	2.25
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.5	10/16/2024	1.98

Biosolids: Rock Creek Resource Recovery Facility					
Sample Point Description	**Pollutant Parameter**	**Analysis Description**	**MRL**	**Sample Date**	**Biosolids Concentration (mg/kg)**
Rock Creek Cake	Silver	ICP/MS Metals, Dry	0.51	11/12/2024	1.91
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	1/2/2024	578
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	2/12/2024	639
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	2/13/2024	584
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	2/14/2024	638
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	3/12/2024	571
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	4/16/2024	648
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	4/17/2024	666
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	4/18/2024	659
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	5/21/2024	555
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	12	6/18/2024	521
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	13	7/16/2024	708
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	13	7/17/2024	633
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	13	7/18/2024	624
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	8/13/2024	635
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	11	9/10/2024	610
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	12	10/14/2024	658
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	12	10/15/2024	669
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	12	10/16/2024	669
Rock Creek Cake	Zinc	ICP/MS Metals, Dry	13	11/12/2024	690

Form 3 – Treatment Plant Monitoring Data – Hillsboro

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	13.26	5.93	µg/L	NA	0.831			0.041	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	16.27	8.25	µg/L	1.19	1.05	12%	0.16	0.072	55%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	12.73	6.19	µg/L	1.18	1.06	10%	0.13	0.055	56%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	11.00	6.79	µg/L	1.18	0.965	18%	0.11	0.055	50%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	6.04	4.36	µg/L	NA	0.895			0.033	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	9.87	6.88	µg/L	NA	0.794			0.046	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	4.93	3.02	µg/L	NA	0.764			0.019	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	4.42	3.01	µg/L	NA	0.514			0.013	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	4.08	3.38	µg/L	1.36	0.562	59%	0.046	0.016	66%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	4.02	3.28	µg/L	1.37	0.574	58%	0.046	0.016	66%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	3.88	3.15	µg/L	1.46	0.572	61%	0.047	0.015	68%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/21/2024	3.39	2.46	µg/L	NA	0.620			0.013	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/25/2024	3.82	3.04	µg/L	NA	0.712			0.018	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		7/14/2024	2.95	0.00	µg/L	2.04	NA		0.050		
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		7/15/2024	3.00	0.00	µg/L	1.97	NA		0.049		
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		7/16/2024	2.95	0.00	µg/L	1.89	NA		0.046		
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.97	0.00	µg/L	2.15	NA		0.053		
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.26	0.00	µg/L	2.36	NA		0.064		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	11/19/2024	10.34	6.02	µg/L	NA	1.03			0.052	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		11/20/2024	9.68	4.03	µg/L	1.46	NA		0.12		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	12/3/2024	3.83	2.00	µg/L	NA	1.24			0.021	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		12/9/2024	3.82	2.11	µg/L	1.49	NA		0.047		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	13.26	5.93	µg/L	NA	< 0.102			0.0050	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	16.27	8.25	µg/L	< 0.102	< 0.102		0.014	0.0070	49%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	12.73	6.19	µg/L	< 0.102	< 0.102		0.011	0.0053	51%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	11.00	6.79	µg/L	< 0.102	< 0.102		0.0094	0.0058	38%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	6.04	4.36	µg/L	NA	< 0.102			0.0037	

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	9.87	6.88	µg/L	NA	< 0.102			0.0059	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	4.93	3.02	µg/L	NA	< 0.102			0.0026	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.42	3.01	µg/L	NA	< 0.102			0.0026	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.08	3.38	µg/L	< 0.102	< 0.102		0.0035	0.0029	17%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.02	3.28	µg/L	< 0.102	< 0.102		0.0034	0.0028	18%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	3.88	3.15	µg/L	< 0.102	< 0.102		0.0033	0.0027	19%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.39	2.46	µg/L	NA	< 0.102			0.0021	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	3.82	3.04	µg/L	NA	< 0.102			0.0026	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		7/14/2024	2.95	0.00	µg/L	< 0.102	NA		0.0025		
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		7/15/2024	3.00	0.00	µg/L	< 0.102	NA		0.0026		
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		7/16/2024	2.95	0.00	µg/L	0.110	NA		0.0027		
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.97	0.00	µg/L	0.154	NA		0.0038		
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.26	0.00	µg/L	0.395	NA		0.011		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	11/19/2024	10.34	6.02	µg/L	NA	< 0.102			0.0051	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.68	4.03	µg/L	< 0.102	NA		0.0082		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	3.83	2.00	µg/L	NA	< 0.102			0.0017	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	3.82	2.11	µg/L	< 0.102	NA		0.0032		
Chromium	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	13.26	5.93	µg/L	NA	< 0.406			0.020	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	16.27	8.25	µg/L	1.27	0.422	67%	0.17	0.029	83%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	12.73	6.19	µg/L	1.47	0.425	71%	0.16	0.022	86%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	11.00	6.79	µg/L	1.30	0.430	67%	0.12	0.024	80%
Chromium	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	6.04	4.36	µg/L	NA	0.550			0.020	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	9.87	6.88	µg/L	NA	< 0.406			0.023	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	4.93	3.02	µg/L	NA	0.543			0.014	
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.42	3.01	µg/L	NA	0.493			0.012	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.08	3.38	µg/L	1.59	0.463	71%	0.054	0.013	76%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.02	3.28	µg/L	1.83	0.464	75%	0.061	0.013	79%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	3.88	3.15	µg/L	1.92	0.455	76%	0.062	0.012	81%
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.39	2.46	µg/L	NA	0.471			0.0097	

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	3.82	3.04	µg/L	NA	0.471			0.012	
Chromium	ICP/MS Metals, Total Recoverable	0.406		7/14/2024	2.95	0.00	µg/L	1.35	NA		0.033		
Chromium	ICP/MS Metals, Total Recoverable	0.406		7/15/2024	3.00	0.00	µg/L	1.59	NA		0.040		
Chromium	ICP/MS Metals, Total Recoverable	0.406		7/16/2024	2.95	0.00	µg/L	1.51	NA		0.037		
Chromium	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.97	0.00	µg/L	4.50	NA		0.11		
Chromium	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.26	0.00	µg/L	2.13	NA		0.058		
Chromium	ICP/MS Metals, Total Recoverable		0.406	11/19/2024	10.34	6.02	µg/L	NA	< 0.406			0.020	
Chromium	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.68	4.03	µg/L	1.18	NA		0.095		
Chromium	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	3.83	2.00	µg/L	NA	0.430			0.0072	
Chromium	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	3.82	2.11	µg/L	1.31	NA		0.042		
Copper	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	13.26	5.93	µg/L	NA	3.54			0.18	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	16.27	8.25	µg/L	6.68	2.89	57%	0.91	0.20	78%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	12.73	6.19	µg/L	22.1	4.72	79%	2.3	0.24	90%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	11.00	6.79	µg/L	13.4	3.55	74%	1.2	0.20	84%
Copper	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	6.04	4.36	µg/L	NA	3.66			0.13	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	9.87	6.88	µg/L	NA	5.05			0.29	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	4.93	3.02	µg/L	NA	5.03			0.13	
Copper	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.42	3.01	µg/L	NA	3.79			0.095	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.08	3.38	µg/L	24.8	6.88	72%	0.84	0.19	77%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.02	3.28	µg/L	102	6.34	94%	3.4	0.17	95%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	3.88	3.15	µg/L	40.3	6.27	84%	1.3	0.16	87%
Copper	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.39	2.46	µg/L	NA	5.36			0.11	
Copper	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	3.82	3.04	µg/L	NA	4.80			0.12	
Copper	ICP/MS Metals, Total Recoverable	0.406		7/14/2024	2.95	0.00	µg/L	35.4	NA		0.87		
Copper	ICP/MS Metals, Total Recoverable	0.406		7/15/2024	3.00	0.00	µg/L	48.6	NA		1.2		
Copper	ICP/MS Metals, Total Recoverable	0.406		7/16/2024	2.95	0.00	µg/L	55.0	NA		1.4		
Copper	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.97	0.00	µg/L	93.4	NA		2.3		
Copper	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.26	0.00	µg/L	83.7	NA		2.3		
Copper	ICP/MS Metals, Total Recoverable		0.406	11/19/2024	10.34	6.02	µg/L	NA	5.04			0.25	

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.68	4.03	µg/L	85.4	NA		6.9		
Copper	ICP/MS Metals, Total Recoverable		0.406	11/26/2024	6.65	4.22	µg/L	NA	7.03			0.25	
Copper	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	3.83	2.00	µg/L	NA	7.70			0.13	
Copper	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	3.82	2.11	µg/L	86.6	NA		2.8		
Cyanide	Cyanide, Total	1	1	1/29/2024	12.73	6.19	µg/L	1.00	< 1	50%	0.11	0.052	51%
Cyanide	Cyanide, Total	1	1	1/30/2024	11.00	6.79	µg/L	1.08	< 1	54%	0.099	0.057	43%
Cyanide	Cyanide, Total	1	1	1/31/2024	10.05	7.27	µg/L	1.19	< 1	58%	0.10	0.061	39%
Cyanide	Cyanide, Total	1	1	4/8/2024	4.02	3.28	µg/L	1.93	1.75	9%	0.065	0.048	26%
Cyanide	Cyanide, Total	1	1	4/9/2024	3.88	3.15	µg/L	1.97	1.86	6%	0.064	0.049	23%
Cyanide	Cyanide, Total	1	1	4/10/2024	3.73	3.06	µg/L	2.16	1.98	8%	0.067	0.051	25%
Cyanide	Cyanide, Total	1		7/15/2024	3.00	0.00	µg/L	3.14	NA		0.079		
Cyanide	Cyanide, Total	1		7/16/2024	2.95	0.00	µg/L	2.50	NA		0.062		
Cyanide	Cyanide, Total	1		7/17/2024	2.97	0.00	µg/L	2.62	NA		0.065		
Hardness	ICP/MS Metals, Total Recoverable		0.5	1/9/2024	13.26	5.93	mg/L	NA	78.5			3900	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/28/2024	16.27	8.25	mg/L	82.3	75.6	8%	11000	5200	53%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/29/2024	12.73	6.19	mg/L	89.9	83.1	8%	9500	4300	55%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/30/2024	11.00	6.79	mg/L	96.2	87.5	9%	8800	5000	44%
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/6/2024	6.04	4.36	mg/L	NA	92.5			3400	
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/20/2024	7.08	5.13	mg/L	NA	90.4			3900	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/5/2024	9.87	6.88	mg/L	NA	89.6			5100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/18/2024	4.93	3.02	mg/L	NA	91.1			2300	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/2/2024	4.42	3.01	mg/L	NA	94.2			2400	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/7/2024	4.08	3.38	mg/L	114	90.2	21%	3900	2500	34%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/8/2024	4.02	3.28	mg/L	127	90.5	29%	4300	2500	42%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/9/2024	3.88	3.15	mg/L	111	95.9	14%	3600	2500	30%
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/16/2024	3.52	2.65	mg/L	NA	93.7			2100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/21/2024	3.39	2.46	mg/L	NA	92.6			1900	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/25/2024	3.82	3.04	mg/L	NA	96.8			2500	
Hardness	ICP/MS Metals, Total Recoverable	0.5		7/14/2024	2.95	0.00	mg/L	95.1	NA		2300		

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable	0.5		7/15/2024	3.00	0.00	mg/L	101	NA		2500		
Hardness	ICP/MS Metals, Total Recoverable	0.5		7/16/2024	2.95	0.00	mg/L	99.5	NA		2400		
Hardness	ICP/MS Metals, Total Recoverable	0.5		10/16/2024	2.97	0.00	mg/L	91.1	NA		2300		
Hardness	ICP/MS Metals, Total Recoverable	0.5		11/6/2024	3.26	0.00	mg/L	100	NA		2700		
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/19/2024	10.34	6.02	mg/L	NA	73.0			3700	
Hardness	ICP/MS Metals, Total Recoverable	0.5		11/20/2024	9.68	4.03	mg/L	77.8	NA		6300		
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/26/2024	6.65	4.22	mg/L	NA	76.6			2700	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/3/2024	3.83	2.00	mg/L	NA	86.1			1400	
Hardness	ICP/MS Metals, Total Recoverable	0.5		12/9/2024	3.82	2.11	mg/L	101	NA		3200		
Lead	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	13.26	5.93	µg/L	NA	< 0.102			0.0050	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	16.27	8.25	µg/L	0.424	< 0.102	88%	0.058	0.0070	88%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	12.73	6.19	µg/L	0.585	< 0.102	91%	0.062	0.0053	92%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	11.00	6.79	µg/L	0.597	0.167	72%	0.055	0.0095	83%
Lead	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	6.04	4.36	µg/L	NA	0.342			0.012	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	9.87	6.88	µg/L	NA	0.196			0.011	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	4.93	3.02	µg/L	NA	0.233			0.0059	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.42	3.01	µg/L	NA	0.435			0.011	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.08	3.38	µg/L	0.683	0.151	78%	0.023	0.0043	82%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.02	3.28	µg/L	1.14	0.119	90%	0.038	0.0033	91%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	3.88	3.15	µg/L	1.75	0.130	93%	0.057	0.0034	94%
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.39	2.46	µg/L	NA	0.559			0.011	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	3.82	3.04	µg/L	NA	0.276			0.0070	
Lead	ICP/MS Metals, Total Recoverable	0.1015		7/14/2024	2.95	0.00	µg/L	0.897	NA		0.022		
Lead	ICP/MS Metals, Total Recoverable	0.1015		7/15/2024	3.00	0.00	µg/L	1.15	NA		0.029		
Lead	ICP/MS Metals, Total Recoverable	0.1015		7/16/2024	2.95	0.00	µg/L	1.29	NA		0.032		
Lead	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.97	0.00	µg/L	2.92	NA		0.072		
Lead	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.26	0.00	µg/L	2.69	NA		0.073		
Lead	ICP/MS Metals, Total Recoverable		0.1015	11/19/2024	10.34	6.02	µg/L	NA	0.170			0.0085	
Lead	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.68	4.03	µg/L	1.19	NA		0.096		

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Lead	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	3.83	2.00	µg/L	NA	0.167			0.0028	
Lead	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	3.82	2.11	µg/L	1.39	NA		0.044		
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/28/2024	16.27	8.25	ng/L	7.18	1.14	84%	0.00097	0.000078	92%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/29/2024	12.73	6.19	ng/L	12.4	0.878	93%	0.0013	0.000045	97%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/30/2024	11.00	6.79	ng/L	18.0	0.930	95%	0.0017	0.000053	97%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/7/2024	4.08	3.38	ng/L	21.3	1.28	94%	0.00072	0.000036	95%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/8/2024	4.02	3.28	ng/L	32.6	1.43	96%	0.0011	0.000039	96%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/9/2024	3.88	3.15	ng/L	64.0	1.34	98%	0.0021	0.000035	98%
Mercury	Mercury by Purge & Trap, Total	1		7/15/2024	3.00	0.00	ng/L	37.3	NA		0.00093		
Mercury	Mercury by Purge & Trap, Total	1		7/16/2024	2.95	0.00	ng/L	52.6	NA		0.0013		
Mercury	Mercury by Purge & Trap, Total	1		8/26/2024	3.16	0.00	ng/L	35.5	NA		0.00094		
Mercury	Mercury by Purge & Trap, Total	1		8/27/2024	2.98	0.00	ng/L	34.0	NA		0.00085		
Mercury	Mercury by Purge & Trap, Total	1		8/28/2024	2.97	0.00	ng/L	39.3	NA		0.00097		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	13.26	5.93	µg/L	NA	0.726			0.036	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	16.27	8.25	µg/L	0.581	0.454	22%	0.079	0.031	60%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	12.73	6.19	µg/L	0.844	0.504	40%	0.090	0.026	71%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	11.00	6.79	µg/L	0.963	0.653	32%	0.088	0.037	58%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	6.04	4.36	µg/L	NA	1.15			0.042	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	9.87	6.88	µg/L	NA	0.734			0.042	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	4.93	3.02	µg/L	NA	1.09			0.027	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.42	3.01	µg/L	NA	1.12			0.028	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.08	3.38	µg/L	1.26	0.979	22%	0.043	0.028	36%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.02	3.28	µg/L	1.67	0.872	48%	0.056	0.024	57%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	3.88	3.15	µg/L	1.92	1.13	41%	0.062	0.030	52%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.39	2.46	µg/L	NA	1.41			0.029	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	3.82	3.04	µg/L	NA	1.79			0.045	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		7/14/2024	2.95	0.00	µg/L	1.71	NA		0.042		
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		7/15/2024	3.00	0.00	µg/L	2.77	NA		0.069		
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		7/16/2024	2.95	0.00	µg/L	2.81	NA		0.069		

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.97	0.00	µg/L	2.33	NA		0.058		
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.26	0.00	µg/L	1.53	NA		0.042		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	11/19/2024	10.34	6.02	µg/L	NA	0.734			0.037	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.68	4.03	µg/L	0.980	NA		0.079		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	3.83	2.00	µg/L	NA	0.913			0.015	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	3.82	2.11	µg/L	1.02	NA		0.032		
Nickel	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	13.26	5.93	µg/L	NA	5.72			0.28	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	16.27	8.25	µg/L	1.50	1.59	-6%	0.20	0.11	46%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	12.73	6.19	µg/L	4.69	2.69	43%	0.50	0.14	72%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	11.00	6.79	µg/L	4.94	3.92	21%	0.45	0.22	51%
Nickel	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	6.04	4.36	µg/L	NA	11.9			0.43	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	9.87	6.88	µg/L	NA	6.14			0.35	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	4.93	3.02	µg/L	NA	9.62			0.24	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.42	3.01	µg/L	NA	17.3			0.43	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.08	3.38	µg/L	3.13	5.82	-86%	0.11	0.16	-54%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.02	3.28	µg/L	33.5	6.34	81%	1.1	0.17	85%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	3.88	3.15	µg/L	6.31	11.0	-74%	0.20	0.29	-42%
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.39	2.46	µg/L	NA	25.6			0.53	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	3.82	3.04	µg/L	NA	7.77			0.20	
Nickel	ICP/MS Metals, Total Recoverable	0.406		7/14/2024	2.95	0.00	µg/L	3.93	NA		0.097		
Nickel	ICP/MS Metals, Total Recoverable	0.406		7/15/2024	3.00	0.00	µg/L	9.69	NA		0.24		
Nickel	ICP/MS Metals, Total Recoverable	0.406		7/16/2024	2.95	0.00	µg/L	9.95	NA		0.24		
Nickel	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.97	0.00	µg/L	17.8	NA		0.44		
Nickel	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.26	0.00	µg/L	14.6	NA		0.40		
Nickel	ICP/MS Metals, Total Recoverable		0.406	11/19/2024	10.34	6.02	µg/L	NA	5.50			0.28	
Nickel	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.68	4.03	µg/L	11.8	NA		0.95		
Nickel	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	3.83	2.00	µg/L	NA	3.69			0.062	
Nickel	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	3.82	2.11	µg/L	6.26	NA		0.20		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	13.26	5.93	µg/L	NA	< 0.508			0.025	

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	16.27	8.25	µg/L	< 0.508	< 0.508		0.069	0.035	49%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	12.73	6.19	µg/L	< 0.508	< 0.508		0.054	0.026	51%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	11.00	6.79	µg/L	< 0.508	< 0.508		0.047	0.029	38%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	6.04	4.36	µg/L	NA	< 0.508			0.018	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	9.87	6.88	µg/L	NA	< 0.508			0.029	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	4.93	3.02	µg/L	NA	< 0.508			0.013	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	4.42	3.01	µg/L	NA	< 0.508			0.013	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	4.08	3.38	µg/L	< 0.508	< 0.508		0.017	0.014	17%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	4.02	3.28	µg/L	< 0.508	< 0.508		0.017	0.014	18%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	3.88	3.15	µg/L	< 0.508	< 0.508		0.016	0.013	19%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/21/2024	3.39	2.46	µg/L	NA	< 0.508			0.010	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/25/2024	3.82	3.04	µg/L	NA	< 0.508			0.013	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		7/14/2024	2.95	0.00	µg/L	< 0.508	NA		0.012		
Selenium	ICP/MS Metals, Total Recoverable	0.5075		7/15/2024	3.00	0.00	µg/L	0.526	NA		0.013		
Selenium	ICP/MS Metals, Total Recoverable	0.5075		7/16/2024	2.95	0.00	µg/L	< 0.508	NA		0.012		
Selenium	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.97	0.00	µg/L	0.734	NA		0.018		
Selenium	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.26	0.00	µg/L	0.528	NA		0.014		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	11/19/2024	10.34	6.02	µg/L	NA	< 0.508			0.026	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		11/20/2024	9.68	4.03	µg/L	< 0.508	NA		0.041		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	12/3/2024	3.83	2.00	µg/L	NA	< 0.508			0.0085	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		12/9/2024	3.82	2.11	µg/L	< 0.508	NA		0.016		
Silver	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	13.26	5.93	µg/L	NA	< 0.102			0.0050	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	16.27	8.25	µg/L	< 0.102	< 0.102		0.014	0.0070	49%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	12.73	6.19	µg/L	< 0.102	< 0.102		0.011	0.0053	51%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	11.00	6.79	µg/L	< 0.102	< 0.102		0.0094	0.0058	38%
Silver	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	6.04	4.36	µg/L	NA	< 0.102			0.0037	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	9.87	6.88	µg/L	NA	< 0.102			0.0059	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	4.93	3.02	µg/L	NA	< 0.102			0.0026	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.42	3.01	µg/L	NA	< 0.102			0.0026	

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.08	3.38	µg/L	0.109	< 0.102	53%	0.0037	0.0029	22%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.02	3.28	µg/L	0.163	< 0.102	69%	0.0055	0.0028	49%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	3.88	3.15	µg/L	0.118	< 0.102	57%	0.0038	0.0027	30%
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.39	2.46	µg/L	NA	< 0.102			0.0021	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	3.82	3.04	µg/L	NA	< 0.102			0.0026	
Silver	ICP/MS Metals, Total Recoverable	0.1015		7/14/2024	2.95	0.00	µg/L	0.267	NA		0.0066		
Silver	ICP/MS Metals, Total Recoverable	0.1015		7/15/2024	3.00	0.00	µg/L	0.158	NA		0.0040		
Silver	ICP/MS Metals, Total Recoverable	0.1015		7/16/2024	2.95	0.00	µg/L	0.147	NA		0.0036		
Silver	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.97	0.00	µg/L	0.169	NA		0.0042		
Silver	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.26	0.00	µg/L	0.205	NA		0.0056		
Silver	ICP/MS Metals, Total Recoverable		0.1015	11/19/2024	10.34	6.02	µg/L	NA	< 0.102			0.0051	
Silver	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.68	4.03	µg/L	0.103	NA		0.0083		
Silver	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	3.83	2.00	µg/L	NA	< 0.102			0.0017	
Silver	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	3.82	2.11	µg/L	0.107	NA		0.0034		
Zinc	ICP/MS Metals, Total Recoverable		2.537	1/9/2024	13.26	5.93	µg/L	NA	19.1			0.94	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/28/2024	16.27	8.25	µg/L	32.6	34.6	-6%	4.4	2.4	46%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/29/2024	12.73	6.19	µg/L	40.6	24.8	39%	4.3	1.3	70%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/30/2024	11.00	6.79	µg/L	37.4	23.6	37%	3.4	1.3	61%
Zinc	ICP/MS Metals, Total Recoverable		2.537	2/6/2024	6.04	4.36	µg/L	NA	32.0			1.2	
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/5/2024	9.87	6.88	µg/L	NA	25.9			1.5	
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/18/2024	4.93	3.02	µg/L	NA	35.6			0.90	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/2/2024	4.42	3.01	µg/L	NA	40.1			1.0	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/7/2024	4.08	3.38	µg/L	80.7	27.7	66%	2.7	0.78	72%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/8/2024	4.02	3.28	µg/L	77.2	27.4	64%	2.6	0.75	71%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/9/2024	3.88	3.15	µg/L	118	29.0	75%	3.8	0.76	80%
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/21/2024	3.39	2.46	µg/L	NA	48.7			1.0	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/25/2024	3.82	3.04	µg/L	NA	43.5			1.1	
Zinc	ICP/MS Metals, Total Recoverable	2.537		7/14/2024	2.95	0.00	µg/L	138	NA		3.4		
Zinc	ICP/MS Metals, Total Recoverable	2.537		7/15/2024	3.00	0.00	µg/L	126	NA		3.2		

Influent-Effluent Metals & Cyanide: Hillsboro Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Zinc	ICP/MS Metals, Total Recoverable	2.537		7/16/2024	2.95	0.00	µg/L	116	NA		2.9		
Zinc	ICP/MS Metals, Total Recoverable	2.537		10/16/2024	2.97	0.00	µg/L	208	NA		5.2		
Zinc	ICP/MS Metals, Total Recoverable	2.537		11/6/2024	3.26	0.00	µg/L	143	NA		3.9		
Zinc	ICP/MS Metals, Total Recoverable		2.537	11/19/2024	10.34	6.02	µg/L	NA	31.5			1.6	
Zinc	ICP/MS Metals, Total Recoverable	2.537		11/20/2024	9.68	4.03	µg/L	55.9	NA		4.5		
Zinc	ICP/MS Metals, Total Recoverable		2.537	12/3/2024	3.83	2.00	µg/L	NA	33.6			0.56	
Zinc	ICP/MS Metals, Total Recoverable	2.537		12/9/2024	3.82	2.11	µg/L	98.9	NA		3.2		

Form 3 – Treatment Plant Monitoring Data – Forest Grove

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	12.93	11.95	µg/L	NA	0.826			0.082	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	13.43	10.78	µg/L	1.13	0.859	24%	0.13	0.077	39%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	10.61	8.47	µg/L	1.06	0.879	17%	0.094	0.062	34%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	9.29	7.96	µg/L	1.09	0.838	23%	0.084	0.056	34%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	5.86	4.93	µg/L	NA	0.848			0.035	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	8.24	7.20	µg/L	NA	0.884			0.053	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	5.06	3.98	µg/L	NA	0.816			0.027	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	4.73	3.62	µg/L	NA	0.825			0.025	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	4.36	3.48	µg/L	1.28	0.767	40%	0.047	0.022	52%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	4.22	3.42	µg/L	1.25	0.784	37%	0.044	0.022	49%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	4.13	3.11	µg/L	1.18	0.762	35%	0.041	0.020	51%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/21/2024	3.52	2.25	µg/L	NA	0.641			0.012	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	4/25/2024	4.19	3.32	µg/L	NA	0.657			0.018	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	3.90	3.13	µg/L	NA	0.811			0.021	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	3.15	2.32	µg/L	NA	0.809			0.016	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	3.45	2.72	µg/L	NA	0.855			0.019	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	5.02	4.25	µg/L	1.53	0.906	41%	0.064	0.032	50%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	5.19	4.41	µg/L	1.32	0.904	32%	0.057	0.033	42%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	5.21	4.40	µg/L	1.73	0.865	50%	0.075	0.032	58%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	9/3/2024	4.87	4.13	µg/L	NA	0.885			0.030	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		9/18/2024	4.82	4.08	µg/L	1.63	NA		0.066		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	10/1/2024	2.90	2.06	µg/L	NA	0.595			0.010	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.72	1.84	µg/L	1.02	NA		0.023		
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.28	2.51	µg/L	1.91	NA		0.052		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	11/12/2024	5.54	4.68	µg/L	NA	1.16			0.045	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		11/20/2024	9.35	8.36	µg/L	1.30	NA		0.10		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	12/3/2024	4.25	3.42	µg/L	NA	1.04			0.030	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		12/9/2024	4.06	3.30	µg/L	1.38	NA		0.047		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	12.93	11.95	µg/L	NA	< 0.102			0.010	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	13.43	10.78	µg/L	< 0.102	< 0.102		0.011	0.0092	20%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	10.61	8.47	µg/L	< 0.102	< 0.102		0.0090	0.0072	20%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	9.29	7.96	µg/L	< 0.102	< 0.102		0.0079	0.0068	14%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	5.86	4.93	µg/L	NA	< 0.102			0.0042	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	8.24	7.20	µg/L	NA	< 0.102			0.0061	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	5.06	3.98	µg/L	NA	< 0.102			0.0034	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.73	3.62	µg/L	NA	< 0.102			0.0031	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.36	3.48	µg/L	< 0.102	< 0.102		0.0037	0.0030	20%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.22	3.42	µg/L	< 0.102	< 0.102		0.0036	0.0029	19%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	4.13	3.11	µg/L	< 0.102	< 0.102		0.0035	0.0026	25%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.52	2.25	µg/L	NA	< 0.102			0.0019	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	4.19	3.32	µg/L	NA	< 0.102			0.0028	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	3.90	3.13	µg/L	NA	< 0.102			0.0027	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	2.32	µg/L	NA	< 0.102			0.0020	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.72	µg/L	NA	< 0.102			0.0023	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	4.25	µg/L	0.103	< 0.102	51%	0.0043	0.0036	16%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	4.41	µg/L	< 0.102	< 0.102		0.0044	0.0038	15%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	4.40	µg/L	0.103	< 0.102	51%	0.0045	0.0037	16%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	4.13	µg/L	NA	< 0.102			0.0035	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	4.08	µg/L	0.109	NA		0.0044		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	10/1/2024	2.90	2.06	µg/L	NA	< 0.102			0.0018	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.84	µg/L	0.126	NA		0.0029		
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.51	µg/L	< 0.102	NA		0.0028		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.68	µg/L	NA	< 0.102			0.0040	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.35	8.36	µg/L	< 0.102	NA		0.0080		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	4.25	3.42	µg/L	NA	< 0.102			0.0029	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	4.06	3.30	µg/L	< 0.102	NA		0.0035		
Chromium	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	12.93	11.95	µg/L	NA	< 0.406			0.040	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	13.43	10.78	µg/L	2.03	< 0.406	90%	0.23	0.037	84%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	10.61	8.47	µg/L	1.27	< 0.406	84%	0.11	0.029	74%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	9.29	7.96	µg/L	1.28	< 0.406	84%	0.099	0.027	73%
Chromium	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	5.86	4.93	µg/L	NA	0.517			0.021	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	8.24	7.20	µg/L	NA	0.502			0.030	
Chromium	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	5.06	3.98	µg/L	NA	0.532			0.018	
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.73	3.62	µg/L	NA	0.524			0.016	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.36	3.48	µg/L	1.85	0.532	71%	0.067	0.015	77%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.22	3.42	µg/L	1.62	0.533	67%	0.057	0.015	73%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	4.13	3.11	µg/L	1.50	0.512	66%	0.052	0.013	74%
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.52	2.25	µg/L	NA	0.595			0.011	
Chromium	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	4.19	3.32	µg/L	NA	0.608			0.017	
Chromium	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	3.90	3.13	µg/L	NA	0.535			0.014	
Chromium	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	2.32	µg/L	NA	0.505			0.0098	
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.72	µg/L	NA	0.592			0.013	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	4.25	µg/L	1.83	0.443	76%	0.077	0.016	80%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	4.41	µg/L	1.35	0.456	66%	0.058	0.017	71%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	4.40	µg/L	1.48	0.461	69%	0.064	0.017	74%
Chromium	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	4.13	µg/L	NA	0.460			0.016	
Chromium	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	4.08	µg/L	1.85	NA		0.074		
Chromium	ICP/MS Metals, Total Recoverable		0.406	10/1/2024	2.90	2.06	µg/L	NA	0.552			0.0095	
Chromium	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.84	µg/L	2.06	NA		0.047		
Chromium	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.51	µg/L	3.71	NA		0.10		
Chromium	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.68	µg/L	NA	0.453			0.018	
Chromium	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.35	8.36	µg/L	1.11	NA		0.087		
Chromium	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	4.25	3.42	µg/L	NA	0.438			0.012	
Chromium	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	4.06	3.30	µg/L	1.60	NA		0.054		
Copper	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	12.93	11.95	µg/L	NA	2.96			0.30	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	13.43	10.78	µg/L	30.7	2.10	93%	3.4	0.19	95%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	10.61	8.47	µg/L	22.7	2.66	88%	2.0	0.19	91%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	9.29	7.96	µg/L	22.6	2.60	88%	1.8	0.17	90%
Copper	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	5.86	4.93	µg/L	NA	2.43			0.10	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	8.24	7.20	µg/L	NA	5.73			0.34	
Copper	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	5.06	3.98	µg/L	NA	6.02			0.20	
Copper	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.73	3.62	µg/L	NA	13.2			0.40	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.36	3.48	µg/L	47.6	7.18	85%	1.7	0.21	88%

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.22	3.42	µg/L	73.7	9.03	88%	2.6	0.26	90%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	4.13	3.11	µg/L	55.4	10.7	81%	1.9	0.28	85%
Copper	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.52	2.25	µg/L	NA	8.99			0.17	
Copper	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	4.19	3.32	µg/L	NA	13.8			0.38	
Copper	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	3.90	3.13	µg/L	NA	6.87			0.18	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	2.32	µg/L	NA	4.45			0.086	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/27/2024	5.60	3.61	µg/L	NA	5.96			0.18	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.72	µg/L	NA	14.4			0.33	
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	4.25	µg/L	38.7	8.08	79%	1.6	0.29	82%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	4.41	µg/L	30.5	7.32	76%	1.3	0.27	80%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	4.40	µg/L	50.2	6.73	87%	2.2	0.25	89%
Copper	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	4.13	µg/L	NA	6.96			0.24	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	4.81	4.08	µg/L	NA	8.88			0.30	
Copper	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	4.08	µg/L	35.8	NA		1.4		
Copper	ICP/MS Metals, Total Recoverable		0.406	10/1/2024	2.90	2.06	µg/L	NA	9.03			0.16	
Copper	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.84	µg/L	39.1	NA		0.890		
Copper	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.51	µg/L	48.0	NA		1.3		
Copper	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.68	µg/L	NA	8.13			0.32	
Copper	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.35	8.36	µg/L	13.0	NA		1.0		
Copper	ICP/MS Metals, Total Recoverable		0.406	11/26/2024	7.18	6.24	µg/L	NA	4.52			0.24	
Copper	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	4.25	3.42	µg/L	NA	6.03			0.17	
Copper	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	4.06	3.30	µg/L	42.0	NA		1.4		
Cyanide	Cyanide, Total	1	1	1/29/2024	10.61	8.47	µg/L	1.06	< 1	53%	0.094	0.071	25%
Cyanide	Cyanide, Total	1	1	1/30/2024	9.29	7.96	µg/L	1.15	< 1	56%	0.089	0.066	25%
Cyanide	Cyanide, Total	1	1	1/31/2024	8.59	7.52	µg/L	1.29	1.04	19%	0.092	0.065	29%
Cyanide	Cyanide, Total	1	1	4/8/2024	4.22	3.42	µg/L	2.00	1.69	16%	0.070	0.048	32%
Cyanide	Cyanide, Total	1	1	4/9/2024	4.13	3.11	µg/L	2.13	1.66	22%	0.073	0.043	41%
Cyanide	Cyanide, Total	1	1	4/10/2024	4.01	3.26	µg/L	2.57	1.97	23%	0.086	0.054	38%
Cyanide	Cyanide, Total	1	1	7/15/2024	5.19	4.41	µg/L	4.46	2.69	40%	0.19	0.099	49%
Cyanide	Cyanide, Total	1	1	7/16/2024	5.21	4.40	µg/L	3.17	2.69	15%	0.14	0.099	28%
Cyanide	Cyanide, Total	1	1	7/17/2024	5.19	4.29	µg/L	3.66	2.19	40%	0.16	0.078	51%
Hardness	ICP/MS Metals, Total Recoverable		0.5	1/9/2024	12.93	11.95	mg/L	NA	83.7			8300	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/28/2024	13.43	10.78	mg/L	84.7	74.6	12%	9500	6700	29%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/29/2024	10.61	8.47	mg/L	93.8	84.4	10%	8300	6000	28%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	1/30/2024	9.29	7.96	mg/L	93.7	79.0	16%	7300	5200	28%
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/6/2024	5.86	4.93	mg/L	NA	85.0			3500	
Hardness	ICP/MS Metals, Total Recoverable		0.5	2/20/2024	7.53	6.65	mg/L	NA	92.7			5100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/5/2024	8.24	7.20	mg/L	NA	84.8			5100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	3/18/2024	5.06	3.98	mg/L	NA	89.4			3000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/2/2024	4.73	3.62	mg/L	NA	98.7			3000	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/7/2024	4.36	3.48	mg/L	118	92.4	22%	4300	2700	37%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/8/2024	4.22	3.42	mg/L	120	98.0	18%	4200	2800	34%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	4/9/2024	4.13	3.11	mg/L	144	103	28%	5000	2700	46%
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/16/2024	3.72	2.68	mg/L	NA	112			2500	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/21/2024	3.52	2.25	mg/L	NA	95.9			1800	
Hardness	ICP/MS Metals, Total Recoverable		0.5	4/25/2024	4.19	3.32	mg/L	NA	107			3000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/14/2024	3.90	3.13	mg/L	NA	98.5			2600	
Hardness	ICP/MS Metals, Total Recoverable		0.5	5/28/2024	3.41	2.69	mg/L	NA	102			2300	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/11/2024	3.15	2.32	mg/L	NA	113			2200	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/27/2024	5.60	3.61	mg/L	NA	96.1			2900	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/11/2024	3.45	2.72	mg/L	NA	101			2300	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/14/2024	5.02	4.25	mg/L	93.9	84.0	10%	3900	3000	24%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/15/2024	5.19	4.41	mg/L	112	83.9	25%	4800	3100	36%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/16/2024	5.21	4.40	mg/L	102	89.2	12%	4400	3300	26%
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/23/2024	5.26	4.53	mg/L	NA	87.6			3300	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/6/2024	4.76	3.50	mg/L	NA	83.3			2400	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/20/2024	4.86	4.06	mg/L	NA	76.6			2600	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/3/2024	4.87	4.13	mg/L	NA	76.8			2600	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/17/2024	4.81	4.08	mg/L	NA	78.7			2700	
Hardness	ICP/MS Metals, Total Recoverable	0.5		9/18/2024	4.82	4.08	mg/L	82.8	NA		3300		
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/1/2024	2.90	2.06	mg/L	NA	74.2			1300	
Hardness	ICP/MS Metals, Total Recoverable	0.5		10/16/2024	2.72	1.84	mg/L	95.6	NA		2200		
Hardness	ICP/MS Metals, Total Recoverable	0.5		11/6/2024	3.28	2.51	mg/L	108	NA		3000		
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/12/2024	5.54	4.68	mg/L	NA	86.5			3400	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable	0.5		11/20/2024	9.35	8.36	mg/L	89.4	NA		7000		
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/26/2024	7.18	6.24	mg/L	NA	88.0			4600	
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/3/2024	4.25	3.42	mg/L	NA	95.1			2700	
Hardness	ICP/MS Metals, Total Recoverable	0.5		12/9/2024	4.06	3.30	mg/L	123	NA		4200		
Hardness	ICP/MS Metals, Total Recoverable		0.5	12/17/2024	14.53	13.48	mg/L	NA	79.8			9000	
Lead	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	12.93	11.95	µg/L	NA	0.229			0.023	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	13.43	10.78	µg/L	1.36	< 0.102	96%	0.15	0.0092	94%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	10.61	8.47	µg/L	0.789	0.307	61%	0.070	0.022	69%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	9.29	7.96	µg/L	0.581	0.338	42%	0.045	0.022	50%
Lead	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	5.86	4.93	µg/L	NA	0.267			0.011	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	8.24	7.20	µg/L	NA	0.368			0.022	
Lead	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	5.06	3.98	µg/L	NA	0.404			0.013	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.73	3.62	µg/L	NA	1.14			0.034	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.36	3.48	µg/L	1.07	0.183	83%	0.039	0.0053	86%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.22	3.42	µg/L	1.20	0.719	40%	0.042	0.021	51%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	4.13	3.11	µg/L	1.03	0.943	8%	0.035	0.024	31%
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.52	2.25	µg/L	NA	0.177			0.0033	
Lead	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	4.19	3.32	µg/L	NA	0.612			0.017	
Lead	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	3.90	3.13	µg/L	NA	0.979			0.026	
Lead	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	2.32	µg/L	NA	0.521			0.010	
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.72	µg/L	NA	0.499			0.011	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	4.25	µg/L	1.17	0.303	74%	0.049	0.011	78%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	4.41	µg/L	0.908	0.323	64%	0.039	0.012	70%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	4.40	µg/L	1.44	0.366	75%	0.063	0.013	79%
Lead	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	4.13	µg/L	NA	0.818			0.028	
Lead	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	4.08	µg/L	1.74	NA		0.070		
Lead	ICP/MS Metals, Total Recoverable		0.1015	10/1/2024	2.90	2.06	µg/L	NA	1.14			0.020	
Lead	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.84	µg/L	1.08	NA		0.024		
Lead	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.51	µg/L	2.48	NA		0.068		
Lead	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.68	µg/L	NA	0.646			0.025	
Lead	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.35	8.36	µg/L	0.527	NA		0.041		
Lead	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	4.25	3.42	µg/L	NA	0.535			0.015	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Lead	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	4.06	3.30	µg/L	1.26	NA		0.043		
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/28/2024	13.43	10.78	ng/L	70.6	0.914	99%	0.0079	0.000082	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/29/2024	10.61	8.47	ng/L	11.0	0.766	93%	0.00097	0.000054	94%
Mercury	Mercury by Purge & Trap, Total	1	0.2	1/30/2024	9.29	7.96	ng/L	10.6	0.816	92%	0.00082	0.000054	93%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/7/2024	4.36	3.48	ng/L	42.5	2.84	93%	0.0015	0.000082	95%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/8/2024	4.22	3.42	ng/L	45.2	2.31	95%	0.0016	0.000066	96%
Mercury	Mercury by Purge & Trap, Total	1	0.2	4/9/2024	4.13	3.11	ng/L	16.6	2.07	88%	0.00057	0.000054	91%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/14/2024	5.02	4.25	ng/L	33.4	2.26	93%	0.0014	0.000080	94%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/15/2024	5.19	4.41	ng/L	25.1	2.06	92%	0.0011	0.000076	93%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/16/2024	5.21	4.40	ng/L	29.0	2.26	92%	0.0013	0.000083	93%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	12.93	11.95	µg/L	NA	0.251			0.025	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	13.43	10.78	µg/L	0.399	0.202	49%	0.045	0.018	59%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	10.61	8.47	µg/L	0.388	0.191	51%	0.034	0.013	61%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	9.29	7.96	µg/L	0.402	0.199	50%	0.031	0.013	58%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	5.86	4.93	µg/L	NA	0.266			0.011	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	8.24	7.20	µg/L	NA	0.239			0.014	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	5.06	3.98	µg/L	NA	0.409			0.014	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.73	3.62	µg/L	NA	0.346			0.010	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.36	3.48	µg/L	0.710	0.314	56%	0.026	0.0091	65%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.22	3.42	µg/L	0.729	0.329	55%	0.026	0.0094	63%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	4.13	3.11	µg/L	0.708	0.362	49%	0.024	0.0094	61%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.52	2.25	µg/L	NA	0.412			0.0077	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	4.19	3.32	µg/L	NA	0.492			0.014	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	3.90	3.13	µg/L	NA	0.300			0.0078	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	2.32	µg/L	NA	0.388			0.0075	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.72	µg/L	NA	1.03			0.023	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	4.25	µg/L	1.19	0.531	55%	0.050	0.019	62%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	4.41	µg/L	2.03	0.602	70%	0.088	0.022	75%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	4.40	µg/L	2.11	0.884	58%	0.092	0.032	65%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	4.13	µg/L	NA	0.487			0.017	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	4.08	µg/L	1.36	NA		0.055		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	10/1/2024	2.90	2.06	µg/L	NA	0.364			0.0063	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.84	µg/L	0.964	NA		0.022		
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.51	µg/L	0.895	NA		0.024		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.68	µg/L	NA	0.510			0.020	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.35	8.36	µg/L	0.482	NA		0.038		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	4.25	3.42	µg/L	NA	0.273			0.0078	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	4.06	3.30	µg/L	0.708	NA		0.024		
Nickel	ICP/MS Metals, Total Recoverable		0.406	1/9/2024	12.93	11.95	µg/L	NA	6.38			0.64	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/28/2024	13.43	10.78	µg/L	3.44	1.34	61%	0.39	0.12	69%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/29/2024	10.61	8.47	µg/L	5.54	2.52	55%	0.49	0.18	64%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	1/30/2024	9.29	7.96	µg/L	3.89	3.90	0%	0.30	0.26	14%
Nickel	ICP/MS Metals, Total Recoverable		0.406	2/6/2024	5.86	4.93	µg/L	NA	4.93			0.20	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/5/2024	8.24	7.20	µg/L	NA	2.69			0.16	
Nickel	ICP/MS Metals, Total Recoverable		0.406	3/18/2024	5.06	3.98	µg/L	NA	4.43			0.15	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/2/2024	4.73	3.62	µg/L	NA	7.36			0.22	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/7/2024	4.36	3.48	µg/L	8.59	4.08	52%	0.31	0.12	62%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/8/2024	4.22	3.42	µg/L	8.33	7.85	6%	0.29	0.22	24%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	4/9/2024	4.13	3.11	µg/L	9.65	8.07	16%	0.33	0.21	37%
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/21/2024	3.52	2.25	µg/L	NA	4.13			0.077	
Nickel	ICP/MS Metals, Total Recoverable		0.406	4/25/2024	4.19	3.32	µg/L	NA	6.35			0.18	
Nickel	ICP/MS Metals, Total Recoverable		0.406	5/14/2024	3.90	3.13	µg/L	NA	6.05			0.16	
Nickel	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	2.32	µg/L	NA	13.2			0.26	
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.72	µg/L	NA	11.6			0.26	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	4.25	µg/L	5.53	7.87	-42%	0.23	0.28	-20%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	4.41	µg/L	8.27	6.11	26%	0.36	0.22	37%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	4.40	µg/L	11.5	6.51	43%	0.50	0.24	52%
Nickel	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	4.13	µg/L	NA	7.08			0.24	
Nickel	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	4.08	µg/L	8.50	NA		0.34		
Nickel	ICP/MS Metals, Total Recoverable		0.406	10/1/2024	2.90	2.06	µg/L	NA	10.5			0.18	
Nickel	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.84	µg/L	10.3	NA		0.23		
Nickel	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.51	µg/L	10.9	NA		0.30		
Nickel	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.68	µg/L	NA	6.86			0.27	
Nickel	ICP/MS Metals, Total Recoverable	0.406		11/20/2024	9.35	8.36	µg/L	4.96	NA		0.39		

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Nickel	ICP/MS Metals, Total Recoverable		0.406	12/3/2024	4.25	3.42	µg/L	NA	6.61			0.19	
Nickel	ICP/MS Metals, Total Recoverable	0.406		12/9/2024	4.06	3.30	µg/L	9.76	NA		0.33		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	1/9/2024	12.93	11.95	µg/L	NA	< 0.508			0.051	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/28/2024	13.43	10.78	µg/L	< 0.508	< 0.508		0.057	0.046	20%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/29/2024	10.61	8.47	µg/L	< 0.508	< 0.508		0.045	0.036	20%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	1/30/2024	9.29	7.96	µg/L	< 0.508	< 0.508		0.039	0.034	14%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	2/6/2024	5.86	4.93	µg/L	NA	< 0.508			0.021	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/5/2024	8.24	7.20	µg/L	NA	< 0.508			0.031	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	3/18/2024	5.06	3.98	µg/L	NA	< 0.508			0.017	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/2/2024	4.73	3.62	µg/L	NA	< 0.508			0.015	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/7/2024	4.36	3.48	µg/L	< 0.508	< 0.508		0.018	0.015	20%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/8/2024	4.22	3.42	µg/L	< 0.508	< 0.508		0.018	0.014	19%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	4/9/2024	4.13	3.11	µg/L	< 0.508	< 0.508		0.017	0.013	25%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/21/2024	3.52	2.25	µg/L	NA	< 0.508			0.0095	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	4/25/2024	4.19	3.32	µg/L	NA	< 0.508			0.014	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	5/14/2024	3.90	3.13	µg/L	NA	< 0.508			0.013	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	3.15	2.32	µg/L	NA	< 0.508			0.0098	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	3.45	2.72	µg/L	NA	< 0.508			0.012	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	5.02	4.25	µg/L	< 0.508	< 0.508		0.021	0.018	15%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	5.19	4.41	µg/L	< 0.508	< 0.508		0.022	0.019	15%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	5.21	4.40	µg/L	0.595	< 0.508	57%	0.026	0.019	28%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	9/3/2024	4.87	4.13	µg/L	NA	< 0.508			0.017	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		9/18/2024	4.82	4.08	µg/L	< 0.508	NA		0.020		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	10/1/2024	2.90	2.06	µg/L	NA	< 0.508			0.0087	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.72	1.84	µg/L	0.670	NA		0.015		
Selenium	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.28	2.51	µg/L	< 0.508	NA		0.014		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	11/12/2024	5.54	4.68	µg/L	NA	< 0.508			0.020	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		11/20/2024	9.35	8.36	µg/L	< 0.508	NA		0.040		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	12/3/2024	4.25	3.42	µg/L	NA	< 0.508			0.014	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		12/9/2024	4.06	3.30	µg/L	< 0.508	NA		0.017		
Silver	ICP/MS Metals, Total Recoverable		0.1015	1/9/2024	12.93	11.95	µg/L	NA	< 0.102			0.010	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/28/2024	13.43	10.78	µg/L	< 0.102	< 0.102		0.011	0.0092	20%

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/29/2024	10.61	8.47	µg/L	< 0.102	< 0.102		0.0090	0.0072	20%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	1/30/2024	9.29	7.96	µg/L	< 0.102	< 0.102		0.0079	0.0068	14%
Silver	ICP/MS Metals, Total Recoverable		0.1015	2/6/2024	5.86	4.93	µg/L	NA	< 0.102			0.0042	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/5/2024	8.24	7.20	µg/L	NA	< 0.102			0.0061	
Silver	ICP/MS Metals, Total Recoverable		0.1015	3/18/2024	5.06	3.98	µg/L	NA	< 0.102			0.0034	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/2/2024	4.73	3.62	µg/L	NA	< 0.102			0.0031	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/7/2024	4.36	3.48	µg/L	0.147	< 0.102	66%	0.0053	0.0030	45%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/8/2024	4.22	3.42	µg/L	0.209	< 0.102	76%	0.0074	0.0029	60%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	4/9/2024	4.13	3.11	µg/L	0.133	< 0.102	62%	0.0046	0.0026	42%
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/21/2024	3.52	2.25	µg/L	NA	< 0.102			0.0019	
Silver	ICP/MS Metals, Total Recoverable		0.1015	4/25/2024	4.19	3.32	µg/L	NA	< 0.102			0.0028	
Silver	ICP/MS Metals, Total Recoverable		0.1015	5/14/2024	3.90	3.13	µg/L	NA	< 0.102			0.0027	
Silver	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	2.32	µg/L	NA	< 0.102			0.0020	
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.72	µg/L	NA	< 0.102			0.0023	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	4.25	µg/L	0.335	< 0.102	85%	0.014	0.0036	74%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	4.41	µg/L	0.189	< 0.102	73%	0.0082	0.0038	54%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	4.40	µg/L	0.238	< 0.102	79%	0.010	0.0037	64%
Silver	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	4.13	µg/L	NA	< 0.102			0.0035	
Silver	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	4.08	µg/L	0.123	NA		0.0049		
Silver	ICP/MS Metals, Total Recoverable		0.1015	10/1/2024	2.90	2.06	µg/L	NA	< 0.102			0.0018	
Silver	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.84	µg/L	0.231	NA		0.0052		
Silver	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.51	µg/L	0.161	NA		0.0044		
Silver	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.68	µg/L	NA	< 0.102			0.0040	
Silver	ICP/MS Metals, Total Recoverable	0.1015		11/20/2024	9.35	8.36	µg/L	< 0.102	NA		0.0080		
Silver	ICP/MS Metals, Total Recoverable		0.1015	12/3/2024	4.25	3.42	µg/L	NA	< 0.102			0.0029	
Silver	ICP/MS Metals, Total Recoverable	0.1015		12/9/2024	4.06	3.30	µg/L	< 0.102	NA		0.0035		
Zinc	ICP/MS Metals, Total Recoverable		2.537	1/9/2024	12.93	11.95	µg/L	NA	56.6			5.6	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/28/2024	13.43	10.78	µg/L	54.0	35.2	35%	6.0	3.2	48%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/29/2024	10.61	8.47	µg/L	37.2	62.4	-68%	3.3	4.4	-34%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	1/30/2024	9.29	7.96	µg/L	36.4	44.6	-22%	2.8	3.0	-5%
Zinc	ICP/MS Metals, Total Recoverable		2.537	2/6/2024	5.86	4.93	µg/L	NA	48.3			2.0	
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/5/2024	8.24	7.20	µg/L	NA	47.8			2.9	

Influent-Effluent Metals & Cyanide: Forest Grove Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Zinc	ICP/MS Metals, Total Recoverable		2.537	3/18/2024	5.06	3.98	µg/L	NA	53.3			1.8	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/2/2024	4.73	3.62	µg/L	NA	107			3.2	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/7/2024	4.36	3.48	µg/L	97.1	53.8	45%	3.5	1.6	56%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/8/2024	4.22	3.42	µg/L	88.0	97.2	-10%	3.1	2.8	10%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	4/9/2024	4.13	3.11	µg/L	80.7	88.8	-10%	2.8	2.3	17%
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/21/2024	3.52	2.25	µg/L	NA	51.4			0.96	
Zinc	ICP/MS Metals, Total Recoverable		2.537	4/25/2024	4.19	3.32	µg/L	NA	79.5			2.2	
Zinc	ICP/MS Metals, Total Recoverable		2.537	5/14/2024	3.90	3.13	µg/L	NA	94.0			2.5	
Zinc	ICP/MS Metals, Total Recoverable		2.537	6/11/2024	3.15	2.32	µg/L	NA	82.1			1.6	
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/11/2024	3.45	2.72	µg/L	NA	60.8			1.4	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/14/2024	5.02	4.25	µg/L	125	52.9	58%	5.2	1.9	64%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/15/2024	5.19	4.41	µg/L	104	57.7	44%	4.5	2.1	53%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/16/2024	5.21	4.40	µg/L	145	58.5	60%	6.3	2.1	66%
Zinc	ICP/MS Metals, Total Recoverable		2.537	9/3/2024	4.87	4.13	µg/L	NA	96.1			3.3	
Zinc	ICP/MS Metals, Total Recoverable	2.537		9/18/2024	4.82	4.08	µg/L	108	NA		4.3		
Zinc	ICP/MS Metals, Total Recoverable		2.537	10/1/2024	2.90	2.06	µg/L	NA	99.3			1.7	
Zinc	ICP/MS Metals, Total Recoverable	2.537		10/16/2024	2.72	1.84	µg/L	157	NA		3.6		
Zinc	ICP/MS Metals, Total Recoverable	2.537		11/6/2024	3.28	2.51	µg/L	117	NA		3.2		
Zinc	ICP/MS Metals, Total Recoverable		2.537	11/12/2024	5.54	4.68	µg/L	NA	79.4			3.1	
Zinc	ICP/MS Metals, Total Recoverable	2.537		11/20/2024	9.35	8.36	µg/L	37.6	NA		2.9		
Zinc	ICP/MS Metals, Total Recoverable		2.537	12/3/2024	4.25	3.42	µg/L	NA	78.8			2.2	
Zinc	ICP/MS Metals, Total Recoverable	2.537		12/9/2024	4.06	3.30	µg/L	109	NA		3.7		

Form 3 – Treatment Plant Monitoring Data – Forest Grove Natural Treatment System

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	3.15	0.92	µg/L	NA	1.44			0.011	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/9/2024	5.29	1.23	µg/L	NA	1.42			0.015	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	3.45	2.99	µg/L	NA	1.22			0.030	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	5.02	1.95	µg/L	1.53	1.25	18%	0.064	0.020	68%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	5.19	2.53	µg/L	1.32	1.11	16%	0.057	0.023	59%
Arsenic	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	5.21	2.65	µg/L	1.73	1.05	39%	0.075	0.023	69%
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/23/2024	5.26	2.82	µg/L	NA	0.859			0.020	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	7/30/2024	4.99	2.85	µg/L	NA	0.726			0.017	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	8/6/2024	4.76	1.48	µg/L	NA	0.914			0.011	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	8/13/2024	4.74	2.57	µg/L	NA	0.821			0.018	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	8/20/2024	4.86	2.77	µg/L	NA	0.654			0.015	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	8/27/2024	4.82	2.82	µg/L	NA	0.566			0.013	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	9/3/2024	4.87	2.46	µg/L	NA	0.565			0.012	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	9/10/2024	4.75	2.68	µg/L	NA	0.698			0.016	
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	9/17/2024	4.81	4.07	µg/L	NA	0.532			0.018	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		9/18/2024	4.82	2.97	µg/L	1.63	NA		0.066		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	10/8/2024	2.64	0.95	µg/L	NA	0.602			0.0048	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.72	1.06	µg/L	1.02	NA		0.023		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	10/22/2024	2.78	1.20	µg/L	NA	0.817			0.0082	
Arsenic	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.28	2.11	µg/L	1.91	NA		0.052		
Arsenic	ICP/MS Metals, Total Recoverable		0.5075	11/12/2024	5.54	4.30	µg/L	NA	0.534			0.019	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	0.92	µg/L	NA	< 0.102			0.00078	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/9/2024	5.29	1.23	µg/L	NA	< 0.102			0.0010	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.99	µg/L	NA	< 0.102			0.0025	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	1.95	µg/L	0.103	< 0.102	51%	0.0043	0.0017	62%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	2.53	µg/L	< 0.102	< 0.102		0.0044	0.0022	51%
Cadmium	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	2.65	µg/L	0.103	< 0.102	51%	0.0045	0.0023	50%
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/23/2024	5.26	2.82	µg/L	NA	< 0.102			0.0024	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	7/30/2024	4.99	2.85	µg/L	NA	0.114			0.0027	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	8/6/2024	4.76	1.48	µg/L	NA	< 0.102			0.0013	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	8/13/2024	4.74	2.57	µg/L	NA	< 0.102			0.0022	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	8/20/2024	4.86	2.77	µg/L	NA	< 0.102			0.0024	

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	8/27/2024	4.82	2.82	µg/L	NA	< 0.102			0.0024	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	2.46	µg/L	NA	< 0.102			0.0021	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	9/10/2024	4.75	2.68	µg/L	NA	< 0.102			0.0023	
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	9/17/2024	4.81	4.07	µg/L	NA	< 0.102			0.0035	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	2.97	µg/L	0.109	NA		0.0044		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	10/8/2024	2.64	0.95	µg/L	NA	< 0.102			0.00081	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.06	µg/L	0.126	NA		0.0029		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	10/22/2024	2.78	1.20	µg/L	NA	< 0.102			0.0010	
Cadmium	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.11	µg/L	< 0.102	NA		0.0028		
Cadmium	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.30	µg/L	NA	< 0.102			0.0037	
Chromium	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	0.92	µg/L	NA	0.787			0.0060	
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/9/2024	5.29	1.23	µg/L	NA	0.469			0.0048	
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.99	µg/L	NA	0.747			0.019	
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	1.95	µg/L	1.83	0.702	62%	0.077	0.011	85%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	2.53	µg/L	1.35	0.674	50%	0.058	0.014	76%
Chromium	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	2.65	µg/L	1.48	0.476	68%	0.064	0.011	84%
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/23/2024	5.26	2.82	µg/L	NA	0.754			0.018	
Chromium	ICP/MS Metals, Total Recoverable		0.406	7/30/2024	4.99	2.85	µg/L	NA	0.498			0.012	
Chromium	ICP/MS Metals, Total Recoverable		0.406	8/6/2024	4.76	1.48	µg/L	NA	0.407			0.0050	
Chromium	ICP/MS Metals, Total Recoverable		0.406	8/13/2024	4.74	2.57	µg/L	NA	< 0.406			0.0087	
Chromium	ICP/MS Metals, Total Recoverable		0.406	8/20/2024	4.86	2.77	µg/L	NA	0.419			0.0097	
Chromium	ICP/MS Metals, Total Recoverable		0.406	8/27/2024	4.82	2.82	µg/L	NA	0.430			0.010	
Chromium	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	2.46	µg/L	NA	< 0.406			0.0083	
Chromium	ICP/MS Metals, Total Recoverable		0.406	9/10/2024	4.75	2.68	µg/L	NA	< 0.406			0.0091	
Chromium	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	4.81	4.07	µg/L	NA	< 0.406			0.014	
Chromium	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	2.97	µg/L	1.85	NA		0.074		
Chromium	ICP/MS Metals, Total Recoverable		0.406	10/8/2024	2.64	0.95	µg/L	NA	< 0.406			0.0032	
Chromium	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.06	µg/L	2.06	NA		0.047		
Chromium	ICP/MS Metals, Total Recoverable		0.406	10/22/2024	2.78	1.20	µg/L	NA	< 0.406			0.0041	
Chromium	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.11	µg/L	3.71	NA		0.10		
Chromium	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.30	µg/L	NA	< 0.406			0.015	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	0.92	µg/L	NA	3.32			0.025	
Copper	ICP/MS Metals, Total Recoverable		0.406	6/27/2024	5.60	2.39	µg/L	NA	2.04			0.041	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/9/2024	5.29	1.23	µg/L	NA	2.15			0.022	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.99	µg/L	NA	2.61			0.065	

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	1.95	µg/L	38.7	2.73	93%	1.6	0.044	97%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	2.53	µg/L	30.5	2.55	92%	1.3	0.054	96%
Copper	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	2.65	µg/L	50.2	2.19	96%	2.2	0.048	98%
Copper	ICP/MS Metals, Total Recoverable		0.406	7/23/2024	5.26	2.82	µg/L	NA	2.42			0.057	
Copper	ICP/MS Metals, Total Recoverable		0.406	7/30/2024	4.99	2.85	µg/L	NA	2.42			0.058	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/6/2024	4.76	1.48	µg/L	NA	1.67			0.021	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/13/2024	4.74	2.57	µg/L	NA	1.37			0.029	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/20/2024	4.86	2.77	µg/L	NA	1.74			0.040	
Copper	ICP/MS Metals, Total Recoverable		0.406	8/27/2024	4.82	2.82	µg/L	NA	1.67			0.039	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	2.46	µg/L	NA	1.48			0.030	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/10/2024	4.75	2.68	µg/L	NA	1.42			0.032	
Copper	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	4.81	4.07	µg/L	NA	1.42			0.048	
Copper	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	2.97	µg/L	35.8	NA		1.4		
Copper	ICP/MS Metals, Total Recoverable		0.406	10/8/2024	2.64	0.95	µg/L	NA	0.989			0.0078	
Copper	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.06	µg/L	39.1	NA		0.89		
Copper	ICP/MS Metals, Total Recoverable		0.406	10/22/2024	2.78	1.20	µg/L	NA	0.719			0.0072	
Copper	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.11	µg/L	48.0	NA		1.3		
Copper	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.30	µg/L	NA	1.20			0.043	
Cyanide	Cyanide, Total	1	1	7/15/2024	5.19	2.53	µg/L	4.46	1.50	66%	0.19	0.032	84%
Cyanide	Cyanide, Total	1	1	7/16/2024	5.21	2.65	µg/L	3.17	1.61	49%	0.14	0.036	74%
Cyanide	Cyanide, Total	1	1	7/17/2024	5.19	2.64	µg/L	3.66	1.06	71%	0.16	0.023	85%
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/11/2024	3.15	0.92	mg/L	NA	162			1200	
Hardness	ICP/MS Metals, Total Recoverable		0.5	6/27/2024	5.60	2.39	mg/L	NA	116			2300	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/9/2024	5.29	1.23	mg/L	NA	99.1			1000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/11/2024	3.45	2.99	mg/L	NA	87.2			2200	
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/14/2024	5.02	1.95	mg/L	93.9	88.8	5%	3900	1400	63%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/15/2024	5.19	2.53	mg/L	112	89.2	20%	4800	1900	61%
Hardness	ICP/MS Metals, Total Recoverable	0.5	0.5	7/16/2024	5.21	2.65	mg/L	102	90.2	12%	4400	2000	55%
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/23/2024	5.26	2.82	mg/L	NA	89.9			2100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	7/30/2024	4.99	2.85	mg/L	NA	92.1			2200	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/6/2024	4.76	1.48	mg/L	NA	91.3			1100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/13/2024	4.74	2.57	mg/L	NA	92.6			2000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/20/2024	4.86	2.77	mg/L	NA	86.2			2000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	8/27/2024	4.82	2.82	mg/L	NA	88.1			2100	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/3/2024	4.87	2.46	mg/L	NA	98.3			2000	

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/10/2024	4.75	2.68	mg/L	NA	89.2			2000	
Hardness	ICP/MS Metals, Total Recoverable		0.5	9/17/2024	4.81	4.07	mg/L	NA	84.2			2900	
Hardness	ICP/MS Metals, Total Recoverable	0.5		9/18/2024	4.82	2.97	mg/L	82.8	NA		3300		
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/8/2024	2.64	0.95	mg/L	NA	89.8			710	
Hardness	ICP/MS Metals, Total Recoverable	0.5		10/16/2024	2.72	1.06	mg/L	95.6	NA		2200		
Hardness	ICP/MS Metals, Total Recoverable		0.5	10/22/2024	2.78	1.20	mg/L	NA	97.8			980	
Hardness	ICP/MS Metals, Total Recoverable	0.5		11/6/2024	3.28	2.11	mg/L	108	NA		3000		
Hardness	ICP/MS Metals, Total Recoverable		0.5	11/12/2024	5.54	4.30	mg/L	NA	82.1			2900	
Lead	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	0.92	µg/L	NA	0.353			0.0027	
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/9/2024	5.29	1.23	µg/L	NA	0.174			0.0018	
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.99	µg/L	NA	0.234			0.0058	
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	1.95	µg/L	1.17	0.295	75%	0.049	0.0048	90%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	2.53	µg/L	0.908	0.276	70%	0.039	0.0058	85%
Lead	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	2.65	µg/L	1.44	0.162	89%	0.063	0.0036	94%
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/23/2024	5.26	2.82	µg/L	NA	0.264			0.0062	
Lead	ICP/MS Metals, Total Recoverable		0.1015	7/30/2024	4.99	2.85	µg/L	NA	0.181			0.0043	
Lead	ICP/MS Metals, Total Recoverable		0.1015	8/6/2024	4.76	1.48	µg/L	NA	0.144			0.0018	
Lead	ICP/MS Metals, Total Recoverable		0.1015	8/13/2024	4.74	2.57	µg/L	NA	0.126			0.0027	
Lead	ICP/MS Metals, Total Recoverable		0.1015	8/20/2024	4.86	2.77	µg/L	NA	0.169			0.0039	
Lead	ICP/MS Metals, Total Recoverable		0.1015	8/27/2024	4.82	2.82	µg/L	NA	0.180			0.0042	
Lead	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	2.46	µg/L	NA	0.142			0.0029	
Lead	ICP/MS Metals, Total Recoverable		0.1015	9/10/2024	4.75	2.68	µg/L	NA	0.172			0.0038	
Lead	ICP/MS Metals, Total Recoverable		0.1015	9/17/2024	4.81	4.07	µg/L	NA	0.137			0.0047	
Lead	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	2.97	µg/L	1.74	NA		0.070		
Lead	ICP/MS Metals, Total Recoverable		0.1015	10/8/2024	2.64	0.95	µg/L	NA	0.113			0.00090	
Lead	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.06	µg/L	1.08	NA		0.024		
Lead	ICP/MS Metals, Total Recoverable		0.1015	10/22/2024	2.78	1.20	µg/L	NA	< 0.102			0.0010	
Lead	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.11	µg/L	2.48	NA		0.068		
Lead	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.30	µg/L	NA	0.206			0.0074	
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/14/2024	5.02	1.95	ng/L	33.4	1.27	96%	0.0014	0.000021	99%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/15/2024	5.19	2.53	ng/L	25.1	1.12	96%	0.0011	0.000024	98%
Mercury	Mercury by Purge & Trap, Total	1	0.2	7/16/2024	5.21	2.65	ng/L	29.0	0.799	97%	0.0013	0.000018	99%
Mercury	Mercury by Purge & Trap, Total		0.2	8/6/2024	4.76	1.48	ng/L	NA	0.792			0.0000098	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	0.92	µg/L	NA	0.788			0.0060	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/9/2024	5.29	1.23	µg/L	NA	1.62			0.017	

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.99	µg/L	NA	1.21			0.030	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	1.95	µg/L	1.19	1.18	1%	0.050	0.019	61%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	2.53	µg/L	2.03	1.08	47%	0.088	0.023	74%
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	2.65	µg/L	2.11	1.05	50%	0.092	0.023	75%
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/23/2024	5.26	2.82	µg/L	NA	0.894			0.021	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	7/30/2024	4.99	2.85	µg/L	NA	0.677			0.016	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	8/6/2024	4.76	1.48	µg/L	NA	0.733			0.0090	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	8/13/2024	4.74	2.57	µg/L	NA	0.621			0.013	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	8/20/2024	4.86	2.77	µg/L	NA	0.553			0.013	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	8/27/2024	4.82	2.82	µg/L	NA	0.535			0.013	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	2.46	µg/L	NA	0.591			0.012	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	9/10/2024	4.75	2.68	µg/L	NA	0.657			0.015	
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	9/17/2024	4.81	4.07	µg/L	NA	0.577			0.020	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	2.97	µg/L	1.36	NA		0.055		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	10/8/2024	2.64	0.95	µg/L	NA	0.519			0.0041	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.06	µg/L	0.964	NA		0.022		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	10/22/2024	2.78	1.20	µg/L	NA	0.456			0.0046	
Molybdenum	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.11	µg/L	0.895	NA		0.024		
Molybdenum	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.30	µg/L	NA	0.476			0.017	
Nickel	ICP/MS Metals, Total Recoverable		0.406	6/11/2024	3.15	0.92	µg/L	NA	7.30			0.056	
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/9/2024	5.29	1.23	µg/L	NA	7.47			0.077	
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/11/2024	3.45	2.99	µg/L	NA	7.45			0.19	
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/14/2024	5.02	1.95	µg/L	5.53	7.15	-29%	0.23	0.12	50%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/15/2024	5.19	2.53	µg/L	8.27	7.70	7%	0.36	0.16	55%
Nickel	ICP/MS Metals, Total Recoverable	0.406	0.406	7/16/2024	5.21	2.65	µg/L	11.5	8.55	26%	0.50	0.19	62%
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/23/2024	5.26	2.82	µg/L	NA	6.78			0.16	
Nickel	ICP/MS Metals, Total Recoverable		0.406	7/30/2024	4.99	2.85	µg/L	NA	7.45			0.18	
Nickel	ICP/MS Metals, Total Recoverable		0.406	8/6/2024	4.76	1.48	µg/L	NA	7.31			0.090	
Nickel	ICP/MS Metals, Total Recoverable		0.406	8/13/2024	4.74	2.57	µg/L	NA	7.45			0.16	
Nickel	ICP/MS Metals, Total Recoverable		0.406	8/20/2024	4.86	2.77	µg/L	NA	6.82			0.16	
Nickel	ICP/MS Metals, Total Recoverable		0.406	8/27/2024	4.82	2.82	µg/L	NA	6.01			0.14	
Nickel	ICP/MS Metals, Total Recoverable		0.406	9/3/2024	4.87	2.46	µg/L	NA	8.77			0.18	
Nickel	ICP/MS Metals, Total Recoverable		0.406	9/10/2024	4.75	2.68	µg/L	NA	9.18			0.21	
Nickel	ICP/MS Metals, Total Recoverable		0.406	9/17/2024	4.81	4.07	µg/L	NA	9.01			0.31	
Nickel	ICP/MS Metals, Total Recoverable	0.406		9/18/2024	4.82	2.97	µg/L	8.50	NA		0.34		

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Nickel	ICP/MS Metals, Total Recoverable		0.406	10/8/2024	2.64	0.95	µg/L	NA	6.78			0.054	
Nickel	ICP/MS Metals, Total Recoverable	0.406		10/16/2024	2.72	1.06	µg/L	10.3	NA		0.23		
Nickel	ICP/MS Metals, Total Recoverable		0.406	10/22/2024	2.78	1.20	µg/L	NA	7.60			0.076	
Nickel	ICP/MS Metals, Total Recoverable	0.406		11/6/2024	3.28	2.11	µg/L	10.9	NA		0.30		
Nickel	ICP/MS Metals, Total Recoverable		0.406	11/12/2024	5.54	4.30	µg/L	NA	6.66			0.24	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	6/11/2024	3.15	0.92	µg/L	NA	< 0.508			0.0039	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/9/2024	5.29	1.23	µg/L	NA	< 0.508			0.0052	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/11/2024	3.45	2.99	µg/L	NA	< 0.508			0.013	
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/14/2024	5.02	1.95	µg/L	< 0.508	< 0.508		0.021	0.0083	61%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/15/2024	5.19	2.53	µg/L	< 0.508	< 0.508		0.022	0.011	51%
Selenium	ICP/MS Metals, Total Recoverable	0.5075	0.5075	7/16/2024	5.21	2.65	µg/L	0.595	< 0.508	57%	0.026	0.011	57%
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/23/2024	5.26	2.82	µg/L	NA	< 0.508			0.012	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	7/30/2024	4.99	2.85	µg/L	NA	< 0.508			0.012	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	8/6/2024	4.76	1.48	µg/L	NA	< 0.508			0.0063	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	8/13/2024	4.74	2.57	µg/L	NA	< 0.508			0.011	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	8/20/2024	4.86	2.77	µg/L	NA	< 0.508			0.012	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	8/27/2024	4.82	2.82	µg/L	NA	< 0.508			0.012	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	9/3/2024	4.87	2.46	µg/L	NA	< 0.508			0.010	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	9/10/2024	4.75	2.68	µg/L	NA	< 0.508			0.011	
Selenium	ICP/MS Metals, Total Recoverable		0.5075	9/17/2024	4.81	4.07	µg/L	NA	< 0.508			0.017	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		9/18/2024	4.82	2.97	µg/L	< 0.508	NA		0.020		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	10/8/2024	2.64	0.95	µg/L	NA	< 0.508			0.0040	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		10/16/2024	2.72	1.06	µg/L	0.670	NA		0.015		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	10/22/2024	2.78	1.20	µg/L	NA	< 0.508			0.0051	
Selenium	ICP/MS Metals, Total Recoverable	0.5075		11/6/2024	3.28	2.11	µg/L	< 0.508	NA		0.014		
Selenium	ICP/MS Metals, Total Recoverable		0.5075	11/12/2024	5.54	4.30	µg/L	NA	< 0.508			0.018	
Silver	ICP/MS Metals, Total Recoverable		0.1015	6/11/2024	3.15	0.92	µg/L	NA	< 0.102			0.00078	
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/9/2024	5.29	1.23	µg/L	NA	< 0.102			0.0010	
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/11/2024	3.45	2.99	µg/L	NA	< 0.102			0.0025	
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/14/2024	5.02	1.95	µg/L	0.335	< 0.102	85%	0.014	0.0017	88%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/15/2024	5.19	2.53	µg/L	0.189	< 0.102	73%	0.0082	0.0022	74%
Silver	ICP/MS Metals, Total Recoverable	0.1015	0.1015	7/16/2024	5.21	2.65	µg/L	0.238	< 0.102	79%	0.010	0.0023	78%
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/23/2024	5.26	2.82	µg/L	NA	< 0.102			0.0024	
Silver	ICP/MS Metals, Total Recoverable		0.1015	7/30/2024	4.99	2.85	µg/L	NA	< 0.102			0.0024	
Silver	ICP/MS Metals, Total Recoverable		0.1015	8/20/2024	4.86	2.77	µg/L	NA	< 0.102			0.0024	

Influent-Effluent Metals & Cyanide: Forest Grove NTS Water Resource Recovery Facility													
Pollutant Parameter	Analysis Description	Influent MRL	Effluent MRL	Sample Date	Influent Flow (MGD)	Effluent Flow (MGD)	Conc. Units	Influent Conc.	Effluent Conc.	Conc. Percent Removal	Influent Load (lbs/day)	Effluent Load (lbs/day)	Load Percent Removal
Silver	ICP/MS Metals, Total Recoverable		0.1015	8/27/2024	4.82	2.82	µg/L	NA	< 0.102			0.0024	
Silver	ICP/MS Metals, Total Recoverable		0.1015	9/3/2024	4.87	2.46	µg/L	NA	< 0.102			0.0021	
Silver	ICP/MS Metals, Total Recoverable		0.1015	9/10/2024	4.75	2.68	µg/L	NA	< 0.102			0.0023	
Silver	ICP/MS Metals, Total Recoverable		0.1015	9/17/2024	4.81	4.07	µg/L	NA	< 0.102			0.0035	
Silver	ICP/MS Metals, Total Recoverable	0.1015		9/18/2024	4.82	2.97	µg/L	0.123	NA		0.0049		
Silver	ICP/MS Metals, Total Recoverable		0.1015	10/8/2024	2.64	0.95	µg/L	NA	< 0.102			0.00081	
Silver	ICP/MS Metals, Total Recoverable	0.1015		10/16/2024	2.72	1.06	µg/L	0.231	NA		0.0052		
Silver	ICP/MS Metals, Total Recoverable		0.1015	10/22/2024	2.78	1.20	µg/L	NA	< 0.102			0.0010	
Silver	ICP/MS Metals, Total Recoverable	0.1015		11/6/2024	3.28	2.11	µg/L	0.161	NA		0.0044		
Silver	ICP/MS Metals, Total Recoverable		0.1015	11/12/2024	5.54	4.30	µg/L	NA	< 0.102			0.0037	
Zinc	ICP/MS Metals, Total Recoverable		2.537	6/11/2024	3.15	0.92	µg/L	NA	15.4			0.12	
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/9/2024	5.29	1.23	µg/L	NA	6.07			0.062	
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/11/2024	3.45	2.99	µg/L	NA	5.28			0.13	
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/14/2024	5.02	1.95	µg/L	125	17.3	86%	5.2	0.28	95%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/15/2024	5.19	2.53	µg/L	104	8.07	92%	4.5	0.17	96%
Zinc	ICP/MS Metals, Total Recoverable	2.537	2.537	7/16/2024	5.21	2.65	µg/L	145	4.68	97%	6.3	0.10	98%
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/23/2024	5.26	2.82	µg/L	NA	6.35			0.15	
Zinc	ICP/MS Metals, Total Recoverable		2.537	7/30/2024	4.99	2.85	µg/L	NA	10.1			0.24	
Zinc	ICP/MS Metals, Total Recoverable		2.537	8/6/2024	4.76	1.48	µg/L	NA	16.1			0.20	
Zinc	ICP/MS Metals, Total Recoverable		2.537	8/13/2024	4.74	2.57	µg/L	NA	4.67			0.10	
Zinc	ICP/MS Metals, Total Recoverable		2.537	8/20/2024	4.86	2.77	µg/L	NA	5.42			0.13	
Zinc	ICP/MS Metals, Total Recoverable		2.537	8/27/2024	4.82	2.82	µg/L	NA	6.32			0.15	
Zinc	ICP/MS Metals, Total Recoverable		2.537	9/3/2024	4.87	2.46	µg/L	NA	8.17			0.17	
Zinc	ICP/MS Metals, Total Recoverable		2.537	9/10/2024	4.75	2.68	µg/L	NA	9.11			0.20	
Zinc	ICP/MS Metals, Total Recoverable		2.537	9/17/2024	4.81	4.07	µg/L	NA	6.78			0.23	
Zinc	ICP/MS Metals, Total Recoverable	2.537		9/18/2024	4.82	2.97	µg/L	108	NA		4.3		
Zinc	ICP/MS Metals, Total Recoverable		2.537	10/8/2024	2.64	0.95	µg/L	NA	9.62			0.076	
Zinc	ICP/MS Metals, Total Recoverable	2.537		10/16/2024	2.72	1.06	µg/L	157	NA		3.6		
Zinc	ICP/MS Metals, Total Recoverable		2.537	10/22/2024	2.78	1.20	µg/L	NA	4.37			0.044	
Zinc	ICP/MS Metals, Total Recoverable	2.537		11/6/2024	3.28	2.11	µg/L	117	NA		3.2		
Zinc	ICP/MS Metals, Total Recoverable		2.537	11/12/2024	5.54	4.30	µg/L	NA	5.08			0.18	

Form 4 – Headworks Loading Comparison

- Provide a comparison of POTW's "maximum allowable headworks loading (MAHL in lb/day)" to the highest recorded actual loading for each local limit pollutant.
- For each MAHL exceedance provide a narrative discussion and show associated calculations to demonstrate whether pass through occurred.
- Provide a narrative discussion of the POTW's local limits: any problems encountered in the application of the approved limits, any additional pollutants of concern that may have been observed in either industrial effluent or POTW influent, and any plans to revise or augment existing limits.

The highest single-day water resource recovery facility influent loadings received during 2024 were calculated for each parameter, at each CWS facility, and recorded in Form 4 tables. The comparisons of all influent loadings to the Maximum Allowable Headworks Loadings (MAHLs) indicated the following headworks loads were greater than 90% of the MAHL:

- The MAHL for copper was exceeded at the Forest Grove facility on Jan. 28, 2024. The influent flow of 13.43 MGD was within a range typical of seasonal flows, however the concentration was unusually high at 30.7 ug/L. The TSS for this day was also unusually high at 132 mg/L. The permitted industries' copper data were evaluated and do not suggest the industrial loading contribution was unusual that day. The load-based percent removal efficiency at the Forest Grove facility for copper that day was 95%.
- The MAHL for copper was exceeded at the Forest Grove facility on April 8, 2024. The influent flow was 4.22 MGD, and the concentration was 73.7 ug/L.
- The MAHL for copper was exceeded at the Hillsboro facility on Nov. 20, 2024. The influent flow was 9.68 MGD and the concentration was 85.4 ug/L.
- The MAHL for zinc was exceeded at the Forest Grove facility while it was discharging to the NTS on July 16, 2024. The influent flow was 5.21 MGD and the concentration was 145 ug/L.

Examination of influent loading data indicated that there were no additional loads greater than 90% of the MAHL values in 2024.

All the MAHL exceedances described above are listed in Table 4-1 below and discussed below the table. Table 4-1 displays the facility, pollutant, sample date, analysis description, actual influent loading, and the percent of the MAHL represented by the actual influent loading.

Table 4-1. Influent loadings that exceeded 90% of the MAHL

Treatment Facility	Pollutant	Sample Date	Analysis Description	Actual Influent Loading (lbs/day)	Percent of Treatment Facility MAHL
Forest Grove	Copper, Total	1/28/2024	ICP/MS Metals, Total Recoverable	3.44	122%
Forest Grove	Copper, Total	4/8/2024	ICP/MS Metals, Total Recoverable	2.59	92%
Hillsboro	Copper, Total	11/20/2024	ICP/MS Metals, Total Recoverable	6.89	165%
Forest Grove (via NTS)	Zinc, Total	7/16/2024	ICP/MS Metals, Total Recoverable	6.30	100%

DEQ annual report guidance requires an evaluation for all MAHL exceedances. The MAHL is based on the Allowable Headworks Loadings (AHLs) (pass through, biosolids sludge quality, and nitrification inhibition) that were calculated in the 2021 Local Limits evaluation.

For copper MAHL exceedances, the most sensitive AHLs at the Hillsboro facility and at the Forest Grove facility without discharge to the NTS are based on pass through. The observed concentrations were below the AHL calculated to prevent nitrification inhibition. There is no sludge at the Hillsboro and Forest Grove facilities,

therefore there are no applicable sludge quality allowable loading AHLs. Therefore, only an evaluation for pass through is required.

The evaluation for pass through is used to determine if the observed effluent concentrations could have reasonable potential to cause or contribute to an excursion from the water quality criteria. The permit does not include a water quality-based effluent limit for copper since DEQ found no reasonable potential as part of the 2022 permit evaluation. Therefore, an evaluation for pass through follows the DEQ guidance for finding reasonable potential. The first step is to determine whether the applicable water quality criteria were exceeded at the end of pipe. If this analysis indicates that the plant effluent exceeded water quality criteria at the end of pipe, DEQ guidance requires an analysis to determine whether the applicable water quality criterion was exceeded at the zone of initial dilution (ZID), the regulatory mixing zone (RMZ), or after complete mix.

For zinc MAHL exceedances, the most sensitive AHL at the Forest Grove facility with discharge to the NTS is based on inhibition of nitrification. The observed concentrations were below the AHL calculated to prevent pass through. There is no sludge at the Forest Grove facility, therefore there is no applicable sludge quality allowable loading AHLs. Therefore, only an evaluation for inhibition is required.

The evaluation for inhibition is used to determine if the observed effluent concentrations could have caused nitrification inhibition of the activated sludge and anaerobic digestion processes.

Table 4-2. AHL evaluation

Treatment Facility	Pollutant	Sample Date	Analysis Description	Actual Influent Loading (lbs/day)	Percent of Treatment Facility MAHL	Pass Through Allowable Loading (lbs/day)	Inhibition Allowable Loading (lbs/day)	Sludge Quality Allowable Loading (lbs/day)
Forest Grove	Copper, Total	1/28/2024	ICP/MS Metals, Total Recoverable	3.44	122%	2.82	56.80	NA
Forest Grove	Copper, Total	4/8/2024	ICP/MS Metals, Total Recoverable	2.59	92%	2.82	56.80	NA
Hillsboro	Copper, Total	11/20/2024	ICP/MS Metals, Total Recoverable	6.89	165%	4.17	51.48	NA
Forest Grove (NTS)	Zinc, Total	7/16/2024	ICP/MS Metals, Total Recoverable	6.30	100%	56.13	6.31	NA

Copper: The Biotic Ligand Model (BLM) software (Windward Environmental, 2015) was employed to calculate instantaneous water quality criteria (IWQC) for copper and compare these values with the copper concentrations.

Forest Grove Treatment Facility. The data collected during the pretreatment sampling efforts on Jan. 28, 2024, or April 8, 2024, did not include dissolved copper, any of the input parameters, nor paired ambient data needed to run the BLM model to calculate IWQC for this date, therefore, CWS could not accurately determine IWQC to compare for either the end-of-pipe analysis or the mixing zone analysis for these sampling days. Instead, CWS reviewed three scenarios with existing data for the Forest Grove treatment facility. The results of the three scenarios are included in Tables 4-3 and 4-4 below.

1. CWS reviewed a complete set of copper BLM suite parameters sampled closest in time to the sample date listed in Table 4-1. A full copper BLM suite was collected on Jan. 9, Feb. 6, and April 2, 2024.

2. CWS compiled the 10th percentile data from all Forest Grove copper BLM data between 2020-2024 and ran the end-of-pipe and mixing zone analyses with this dataset.

3. CWS compiled the 90th percentile data from all Forest Grove copper BLM data between 2020-2024 and ran the end-of-pipe and mixing zone analyses with this dataset.

4. Since the samples collected on Jan. 28 and April 8 only included total copper and TSS, CWS conducted a dissolved fraction partitioning calculation based on the procedure for calculating a translator value detailed in Section 4.3 of *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 1996). CWS compiled the 10th percentile data for Forest Grove effluent and Tualatin River at Fernhill values needed for this procedure.

Table 4-3. End-of-pipe analysis for Forest Grove

Scenario	Pollutant	Sample Date	Effluent Dissolved Copper Concentration (ug/L)	Dissolved Copper Instantaneous End-of-Pipe Water Quality Criteria (ugL)	Dissolved Copper Instantaneous Ambient Water Quality Criteria (ug/L)
1	Copper, Dissolved	1/9/2024	1.57	9.75 (CMC) & 6.05 (CCC)	4.28 (CMC) & 2.66 (CCC)
1	Copper, Dissolved	2/6/2024	1.65	80.70 (CMC) & 50.13 (CCC)	2.59 (CMC) & 1.61 (CCC)
1	Copper, Dissolved	4/2/2024	9.75	18.82 (CMC) & 11.69 (CCC)	2.68 (CMC) & 1.67 (CCC)
2	Copper, Dissolved	10% of 2020-24	2.62	5.61 (CMC) & 3.49 (CCC)	1.40 (CMC) & 0.87 (CCC)
3	Copper, Dissolved	90% of 2020-24	8.89	43.08 (CMC) & 26.76 (CCC)	7.43 (CMC) & 4.62 (CCC)
4	Calculated Copper, Dissolved	1/28/2024	1.77	10.99 (CMC) & 6.82 (CCC)	2.65 (CMC) & 1.64 (CCC)
4	Calculated Copper, Dissolved	4/8/2024	5.23	13.91 (CMC) & 8.64 (CCC)	3.80 (CMC) & 2.36 (CCC)

Table 4-4. Mixing zone analysis for Forest Grove

			Dissolved Copper		ZID			RMZ			100% Mix		
			Eff	Amb	ZID	BLM CMC		RMZ	BLM CCC		100% Mix	BLM CCC	
Scenario	Pollutant	Sample Date	Cu ug/L	Cu ug/L	Cu ug/L	Cu ug/L	Toxic Units	Cu ug/L	Cu ug/L	Toxic Units	Cu ug/L	Cu ug/L	Toxic Units
1	Copper, Dissolved	1/9/2024	1.57	0.93	1.14	5.96	NA	0.97	2.83	NA	0.96	2.77	NA
1	Copper, Dissolved	2/6/2024	1.65	0.81	1.08	6.02	NA	0.86	1.89	NA	0.85	1.80	NA
1	Copper, Dissolved	4/2/2024	9.75	0.68	3.60	6.96	0.52	1.17	2.06	0.57	1.02	1.94	0.53
2	Copper, Dissolved	10% of 2020-24	2.53	0.67	1.27	2.66	NA	0.77	1.00	0.77	0.74	0.96	0.77
3	Copper, Dissolved	90% of 2020-24	8.86	1.16	3.65	17.36	NA	1.58	5.57	0.28	1.45	5.27	0.28
4	Calculated Copper, Dissolved	1/28/2024	1.77	0.85	1.15	4.97	NA	0.90	1.87	NA	0.88	1.80	NA
4	Calculated Copper, Dissolved	4/8/2024	5.23	0.79	2.22	6.78	NA	1.03	2.66	0.39	0.96	2.57	0.37

Toxic units equal the concentration divided by the associated criterion; therefore, toxic units greater than one show an exceedance of the criterion. To be consistent with DEQ's copper reasonable potential analysis spreadsheet, the "NA" occurs when there is no reasonable potential at the end of the pipe as compared to criteria derived for the ZID, RMZ, and complete mix. The analysis for the Forest Grove scenarios demonstrates that the plant effluent dissolved copper concentrations met the dissolved copper water quality criteria in the ZID and RMZ (Table 4-4). Therefore, there is no reasonable potential to cause or contribute to an exceedance of the water quality standard.

Additionally, six complete datasets at Forest Grove (excluding effluent flow through the NTS) of paired and concurrent data were collected in 2024 to input to the copper BLM to calculate the IWQC. The dissolved copper concentrations were less than the associated IWQC. This is an additional line of evidence using IWQC calculated with complete datasets that the Forest Grove WRRF is meeting dissolved copper effluent limits. CWS actively reduces the copper load and potential copper toxicity from the Forest Grove WRRF discharges by taking the following actions.

1. CWS is building primary clarifiers at Forest Grove to improve treatment efficiency including copper and zinc removal efficiency.

2. CWS actively surveys all industrial users in the Forest Grove WRRF sewershed. CWS studied effluent concentrations from all permitted industrial users in the Forest Grove sewershed and required the largest industrial user with known copper discharges to install advanced copper pretreatment with daily discharge monitoring requirements.

3. The Forest Grove WRRF operates a continuous effluent pH monitor, which provides feedback to a caustic pump to increase chemical addition when pH falls below 7.1 S.U.

4. CWS installed a continuous pH monitor at the ambient monitoring station (Tualatin River at Fernhill) to measure the river's pH more accurately by maintaining the probe's equilibrium with the river.

Hillsboro Treatment Facility. The data collected during the pretreatment sampling effort on Nov. 20, 2024, did not include dissolved copper, any of the input parameters, nor any paired ambient data required to run the BLM model to calculate the IWQC for this date. The IWQC are specific to the day and location. Therefore, CWS could not accurately determine IWQC to compare for either the end-of-pipe analysis or the copper mixing zones analysis for this sampling day. Instead, CWS reviewed three scenarios with existing data for the Hillsboro treatment facility. The results of the three scenarios are included in Tables 4-5 and 4-6 below.

1. CWS reviewed a complete set of copper BLM suite parameters sampled close in time to the sample date listed in Table 4-1. A full copper BLM suite was collected on Nov. 19, 2024.
2. CWS compiled the 10th percentile data from all Hillsboro BLM input data between 2020-2024 and ran the end-of-pipe and mixing zones analyses with this dataset.
3. CWS compiled the 90th percentile data from all Hillsboro BLM input data between 2020-2024 and ran the end-of-pipe and mixing zones analyses with this dataset.

Table 4-5. End-of-pipe analysis for Hillsboro

Scenario	Pollutant	Sample Date	Effluent Dissolved Copper Concentration (ug/L)	Dissolved Copper Instantaneous End-of-Pipe Water Quality Criteria (ugL)	Dissolved Copper Instantaneous Ambient Water Quality Criteria (ug/L)
1	Copper, Dissolved	11/19/2024	3.54	13.62 (CMC) & 8.46 (CCC)	7.39 (CMC) & 4.59 (CCC)
2	Copper, Dissolved	10% of 2020-24	1.62	6.18 (CMC) & 3.84 (CCC)	1.95 (CMC) & 1.21 (CCC)
3	Copper, Dissolved	90% of 2020-24	5.54	22.09 (CMC) & 13.72 (CCC)	7.70 (CMC) & 4.78 (CCC)

Table 4-6. Mixing zone analysis for Hillsboro

			Dissolved Copper		ZID			RMZ			100% Mix		
			Effluent	Ambient	ZID	BLM CMC		RMZ	BLM CCC		100% Mix	BLM CCC	
Scenario	Pollutant	Sample Date	Cu ug/L	Cu ug/L	Cu ug/L	Cu ug/L	Toxic Units	Cu ug/L	Cu ug/L	Toxic Units	Cu ug/L	Cu ug/L	Toxic Units
1	Copper, Dissolved	11/19/2024	3.54	1.34	2.22	9.80	NA	1.83	5.41	NA	1.54	4.93	NA
2	Copper, Dissolved	10% of 2020-24	1.62	0.71	1.07	3.56	NA	0.91	1.76	NA	0.79	1.44	0.55
3	Copper, Dissolved	90% of 2020-24	5.54	1.21	2.94	12.60	NA	2.17	6.34	NA	1.62	5.37	0.30

The analysis for the Hillsboro scenarios demonstrates with toxic units less than 1 that the plant effluent dissolved copper concentrations meet the dissolved copper water quality criteria in the ZID and RMZ (Table 4-6). Therefore, there is no reasonable potential to exceed the water quality standard.

Additionally, six complete datasets at Hillsboro of paired and concurrent data were collected in 2024 to input to the copper BLM to calculate the IWQC. The dissolved copper concentrations were less than the associated IWQC. This is an additional line of evidence using IWQC calculated with complete datasets that the Hillsboro WRRF is meeting dissolved copper effluent limits.

Zinc: The Forest Grove WRRF employs biological treatment processes to remove ammonia (nitrification). The nitrification inhibition thresholds for zinc were developed by conducting an inhibition study that used return activated sludge from the Forest Grove facility, documented in Appendix F of the *Local Limits Evaluation Report (May 2021)*. The nitrification inhibition study concluded that a threshold concentration of 0.40 mg/L for zinc would protect the Forest Grove WRRF. CWS then applied a factor of safety to conservatively protect the WRRF due to the lack of primary treatment processes and determined that a treatment plant threshold concentration of 0.20 mg/L would provide additional protection. The concentration of the influent flow on the date of the zinc MAHL exceedance (0.145 mg/L) was less than the treatment plant study's threshold concentrations for nitrogen inhibition.

Based on the review of nitrification inhibition events at the Forest Grove WRRF, there was no indication of nitrification inhibition at the Forest Grove WRRF during July 14-16, 2024, time frame.

The DEQ's Reasonable Potential Analysis (RPA) for Toxic Pollutants and RPA for Ammonia calculation workbooks were used to calculate if there is reasonable potential to exceed water quality standards at the end of pipe or at the acute or chronic aquatic toxicity or human health criteria for zinc and ammonia at the NTS.

The influent and effluent concentrations and percent removal are included below for zinc at Forest Grove while discharging to the NTS.

Table 4--7. Influent and Effluent data for Zinc at Forest Grove NTS

Date	Pollutant	Influent Concentration	Influent Flow	Effluent Concentration	Effluent Flow	Concentration Removal	Load Removal
7/14/2024	Zinc, Total	125 ug/L	5.02 MGD	17.3 ug/L	1.95 MGD	86%	95%
7/15/2024	Zinc, Total	104 ug/L	5.19 MGD	8.07 ug/L	2.53 MGD	92%	96%
7/16/2024 (MAHL Exceedance)	Zinc, Total	145 ug/L	5.21 MGD	4.68 ug/L	2.65 MGD	97%	98%

For zinc at Forest Grove WRRF, while discharging from the NTS, Table 4-8 below summarizes the data available during the current permit cycle (Jan. 1, 2023 – Dec. 31, 2024) that was used to conduct the reasonable potential analysis. Hardness data was used during the NTS operational periods (June 1 – Nov. 1).

Table 4--8. Reasonable Potential Analysis for Zinc input data for Forest Grove WRRF via NTS

Location	Pollutant	Date Range	# of Samples	# of Non-Detects	Geomean
NTS Effluent	Zinc, Dissolved	1/1/2023 – 12/31/2024	13	3	2.00
NTS Effluent	Zinc, Total	1/1/2023 – 12/31/2024	34	4	3.81
NTS Effluent	Hardness	1/1/2023 – 12/31/2024	34	0	95.86
Tualatin River at Highway 219	Zinc, Dissolved	1/1/2023 – 12/31/2024	15	11	0.13
Tualatin River at Highway 219	Zinc, Total	1/1/2023 – 12/31/2024	15	0	4.64
Tualatin River at Highway 219	Hardness	1/1/2023 – 12/31/2024	2	0	39.75

The results of the reasonable potential analysis for zinc are summarized in Table 4-9 below.

Table 4--9. Reasonable Potential Analysis for Zinc results for Forest Grove WRRF via NTS

Reasonable Potential Analysis	Pollutant	Estimate Max Effluent Concentration	WQ Crit: 1 Hour (CMC)	WQ Crit: 4 Day (CCC)	RP at End of Pipe?
Aquatic Toxicity	Zinc, Dissolved	28.79	90.60	68.60	NO
Aquatic Toxicity	Zinc, Total	No Aquatic Water Quality Criteria			
Human Health	Zinc, Dissolved	No Human Health Water Quality Criteria			
Human Health	Zinc, Total	20.28	2100	2600	NO

To review the potential impacts of nitrification inhibition at Forest Grove WRRF, the RPA for Ammonia was conducted for the data available for July 2024, which surrounds the zinc MAHL exceedance date (July 16, 2024). Table 4-8 summarizes the data used to conduct the reasonable potential analysis.

Table 4--10. Reasonable Potential Analysis for Ammonia input data for Forest Grove WRRF via NTS

Location	Pollutant	Date Range	# of Samples	# of Non-Detects	Geomean
NTS Effluent	Ammonia	7/1/24-7/31/24	23	0	0.29 mg/L
NTS Effluent	Temperature	7/1/24-7/31/24	27	0	21.13 C
NTS Effluent	pH	7/1/24-7/31/24	27	0	7.27 s.u.
NTS Effluent	Alkalinity	7/1/24-7/31/24	27	0	65.08 mg/L
Tualatin River at Fern Hill	Ammonia	7/1/24-7/31/24	2	2	0.01 mg/L
Tualatin River at Fern Hill	Temperature	7/1/24-7/31/24	2	0	12.5 C
Tualatin River at Fern Hill	pH	7/1/24-7/31/24	2	0	7.4 s.u.
Tualatin River at Fern Hill	Alkalinity	7/1/24-7/31/24	2	0	29.7 mg/L

The results of the reasonable potential analysis for ammonia are summarized in Table 4-9 below.

Table 4-11. Reasonable Potential Analysis for Ammonia results for Forest Grove WRRF via NTS

Reasonable Potential Analysis	Pollutant	Estimate Max Effluent Concentration (mg/L)	Acute WQ Criteria (CMC)	Chronic WQ Criteria: 4 Day	Chronic WQ Criteria: 30 Day Avg.	RP at End of Pipe?
RPA Summer	Ammonia (Freshwater Salmonids)	1.9	13.6	5.5	2.2	NO

The analysis for the Forest Grove scenarios for zinc and ammonia demonstrates that during the period of the MAHL exceedance, 95%-98% of the total zinc was removed before discharging to the receiving waters. There is no evidence of reasonable potential to exceed zinc water quality standards at the NTS, and there is no evidence of reasonable potential to exceed ammonia water quality standards at the NTS. This demonstrates that the zinc MAHL limits are protective for nitrogen inhibition at the Forest Grove facility.

Form 4 – Headworks Loading Comparison

Influent-Effluent Metals & Cyanide: Durham Water Resource Recovery Facility					
Facility	Analysis Description	MAHL (lbs/day)	Sample Date	Max Influent Loading (lbs/day)	Max Percent of MAHL
DM	Arsenic	2.24	1/28/2024	0.392	17%
DM	Cadmium	1.22	4/8/2024	0.0314	3%
DM	Chromium	73.2	1/28/2024	0.526	1%
DM	Copper	37.7	10/8/2024	6.46	17%
DM	Cyanide	17.2	10/9/2024	0.634	4%
DM	Lead	6.52	4/8/2024	0.287	4%
DM	Mercury	0.409	10/8/2024	0.0313	8%
DM	Molybdenum	5.41	7/15/2024	3.23	60%
DM	Nickel	20.9	10/7/2024	1.74	8%
DM	Selenium	3.25	1/28/2024	0.113	3%
DM	Silver	0.961	1/30/2024	0.365	38%
DM	Zinc	80.4	7/15/2024	24.6	31%
FG	Arsenic	1.24	1/28/2024	0.127	10%
FG	Cadmium	0.825	1/28/2024	0.00568	1%
FG	Chromium	56.8	1/28/2024	0.227	0%
FG	Copper	2.82	1/28/2024	3.44	122%
FG	Cyanide	5.68	7/15/2024	0.193	3%
FG	Lead	2.29	1/28/2024	0.152	7%
FG	Mercury	0.246	1/28/2024	0.00791	3%
FG	Molybdenum	NA	7/16/2024	0.0917	NA
FG	Nickel	50.6	7/16/2024	0.500	1%
FG	Selenium	5.22	1/28/2024	0.0284	1%
FG	Silver	0.779	7/14/2024	0.0140	2%
FG	Zinc	17.0	7/16/2024	6.30	37%
HB	Arsenic	1.10	1/28/2024	0.161	15%
HB	Cadmium	0.426	11/6/2024	0.0107	3%
HB	Chromium	47.8	1/28/2024	0.172	0%
HB	Copper	4.17	11/20/2024	6.89	165%
HB	Cyanide	2.55	1/29/2024	0.106	4%
HB	Lead	1.31	11/20/2024	0.096	7%
HB	Mercury	0.053	4/9/2024	0.00207	4%

HB	Molybdenum	NA	1/29/2024	0.0896	NA
HB	Nickel	8.71	4/8/2024	1.12	13%
HB	Selenium	2.33	1/28/2024	0.0344	1%
HB	Silver	0.082	11/20/2024	0.00832	10%
HB	Zinc	17.2	10/16/2024	5.15	30%
NTS	Arsenic	0.935	7/16/2024	0.0752	8%
NTS	Cadmium	0.261	7/16/2024	0.00448	2%
NTS	Chromium	7.88	11/6/2024	0.101	1%
NTS	Copper	4.73	7/16/2024	2.18	46%
NTS	Cyanide	1.60	7/15/2024	0.193	12%
NTS	Lead	1.43	9/18/2024	0.0699	5%
NTS	Mercury	0.068	7/14/2024	0.00140	2%
NTS	Molybdenum	NA	7/16/2024	0.0917	NA
NTS	Nickel	7.88	7/16/2024	0.500	6%
NTS	Selenium	1.55	7/16/2024	0.0259	2%
NTS	Silver	0.134	7/14/2024	0.0140	10%
NTS	Zinc	6.31	7/16/2024	6.30	100%
RC	Arsenic	2.50	1/28/2024	0.868	35%
RC	Cadmium	1.96	1/28/2024	0.0826	4%
RC	Chromium	93.7	1/28/2024	1.18	1%
RC	Copper	57.1	10/7/2024	17.2	30%
RC	Cyanide	12.2	10/8/2024	1.20	10%
RC	Lead	12.0	4/9/2024	0.510	4%
RC	Mercury	0.426	7/15/2024	0.0186	4%
RC	Molybdenum	12.7	1/29/2024	8.50	67%
RC	Nickel	29.2	1/28/2024	3.27	11%
RC	Selenium	6.53	1/28/2024	0.179	3%
RC	Silver	0.629	10/8/2024	0.0689	11%
RC	Zinc	124	1/28/2024	111	89.8%

Form 5 – Treatment Plant Upsets/Problems

Durham Water Resource Recovery Facility NPDES #101141

1. Has the control authority experienced any of the following?

	Yes	No	Unknown	Explain
Interference		X		
Pass through		X		
Fire or explosions (including flash point violations)		X		
Corrosive structural damage (including pH<5.0)		X		
Flow obstructions		X		
Excessive flow or pollutant concentrations		X		
Heat problems		X		
Interference due to oil or grease		X		
Toxic fumes		X		
Illicit dumping of hauled waste		X		

2. Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing *FORM 5*).

   N/A

Form 5 – Treatment Plant Upsets/Problems

Forest Grove Water Resource Recovery Facility NPDES #101142

1. Has the control authority experienced any of the following?

	Yes	No	Unknown	Explain
Interference		X		
Pass through		X		
Fire or explosions (including flash point violations)		X		
Corrosive structural damage (including pH<5.0)		X		
Flow obstructions		X		
Excessive flow or pollutant concentrations		X		
Heat problems		X		
Interference due to oil or grease		X		
Toxic fumes		X		
Illicit dumping of hauled waste		X		

2. Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing *FORM 5*).

   N/A

Form 5 – Treatment Plant Upsets/Problems

Hillsboro Water Resource Recovery Facility NPDES #101143

1. Has the control authority experienced any of the following?

	Yes	No	Unknown	Explain
Interference		X		
Pass through		X		
Fire or explosions (including flash point violations)		X		
Corrosive structural damage (including pH<5.0)		X		
Flow obstructions		X		
Excessive flow or pollutant concentrations		X		
Heat problems		X		
Interference due to oil or grease		X		
Toxic fumes		X		
Illicit dumping of hauled waste		X		

2. Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing *FORM 5*).

   N/A

Form 5 – Treatment Plant Upsets/Problems

Rock Creek Water Resource Recovery Facility NPDES #101144

1. Has the control authority experienced any of the following?

	Yes	No	Unknown	Explain
Interference		X		
Pass through		X		
Fire or explosions (including flash point violations)		X		
Corrosive structural damage (including pH<5.0)		X		
Flow obstructions		X		
Excessive flow or pollutant concentrations		X		
Heat problems		X		
Interference due to oil or grease		X		
Toxic fumes		X		
Illicit dumping of hauled waste		X		

2. Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing *FORM 5*).

   N/A

Form 6 – List of Regulated Users

Name of User	SIU (Y/N)	CIU (Y/N)	40 CFR Part No.	NDCIU (Y/N)	NSCIU (Y/N)	Middle Tier CIU (Y/N)	SIC Code or NAICS Code	Permit Issued (Y/N)
ams-Osram USA Inc.	N	N	40 CFR 469 Subpart D	N	Y	N	2819	N
~~BASF Corporation~~ [1]	~~N~~	~~Y~~	~~40 CFR 433.17~~	~~N~~	~~N~~	~~N~~	~~8731~~	~~Y~~
BASF Corporation [1]	N	N	40 CFR 433.17	N	Y	N	8731	N
Immunology Consultants Laboratory	N	N	40 CFR 439.27	N	Y	N	2836	N
Mi Conveyance Solutions	N	N	40 CFR 428.56 (a)	N	Y	N	3053	N
ACUMED, LLC.	N	Y	40 CFR 433.17	N	N	N	3842	Y
ACUMED, LLC. – Brookwood Campus [2]	N	Y	40 CFR 433.17	N	N	N	3842	Y
Analog Devices	N	Y	40 CFR 469.18	N	N	N	3674	Y
Anodize Solutions, LLC	N	Y	40 CFR 433.17	N	N	N	3471	Y
Davis Tool, Incorporated	N	Y	40 CFR 433.17	N	N	N	3471	Y
Forest Dental Equipment	N	Y	40 CFR 433.17	N	N	N	3843	Y
FormFactor, Inc	N	Y	40 CFR 433.17	N	N	N	3825	Y
Genentech, Inc.	N	Y	40 CFR 439 Subpart D	N	N	N	2834	Y
Hillsboro Landfill Inc	N	Y	40 CFR 445.3	N	N	N	4953	Y
Intel Corporation - Aloha Campus	N	Y	40 CFR 469.18	N	N	N	3674	Y
Intel Corporation - Ronler Acres Campus	N	Y	40 CFR 469.18	N	N	N	3674	Y
JAE Oregon Inc	N	Y	40 CFR 433.17	N	N	N	3678	Y
Jireh Semiconductor, Incorporated	N	Y	40 CFR Part 469.18	N	N	N	3674	Y
KoMiCo Hillsboro, LLC	N	Y	40 CFR 433.17	N	N	N	3479	Y
Lam Research Corp	N	Y	40 CFR 433.17	N	N	N	3559	Y
Leupold & Stevens Inc	N	Y	40 CFR 433.17	N	N	N	3827	Y

Name of User	SIU (Y/N)	CIU (Y/N)	40 CFR Part No.	NDCIU (Y/N)	NSCIU (Y/N)	Middle Tier CIU (Y/N)	SIC Code or NAICS Code	Permit Issued (Y/N)
Lotus Applied Technology	N	Y	40 CFR 433.17	N	N	N	8731	Y
Northwest Rubber Extruders, Inc.	N	Y	40 CFR 428 Subpart E, 40 CFR 463 Subpart A	N	N	N	3061	Y
Pioneer Metal Finishing	N	Y	40 CFR 433.17	N	N	N	3479	Y
Qorvo	N	Y	40 CFR 433.17, 40 CFR 433.17/ 469.18	N	N	N	3674	Y
QuantumClean	N	Y	40 CFR 433.17	N	N	N	3479	Y
Sheldon Manufacturing, Inc.	N	Y	40 CFR 433.17	N	N	N	3821, 3479	Y
Sumitomo Electric Semiconductor Materials, Inc.	N	Y	40 CFR 469.28	N	N	N	3674	Y
TTM Technologies North America, LLC	N	Y	40 CFR 433.17	N	N	N	3672	Y
Westak of Oregon Incorporated	N	Y	40 CFR 433.17	N	N	N	3672	Y
Fujimi Corporation	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	3291	Y
Lieb Foods, LLC	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2035	Y
New Season Foods Incorporated	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2033	Y
Old Trapper Smoked Products	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2013	Y
Oregon Health Sciences University West Campus ONPRC	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	8733	Y
Pacific Foods	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2099	Y
Pacific Nutritional Foods	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2099	Y
Prudential Cleanroom Services	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	7218	Y
Resers Fine Foods - Century Blvd Plant	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2099	Y
Summit Foods, Inc.	Y	N	40 CFR Part 403.3 (v)(1)(ii)	N	N	N	2034	Y
~~Tektronix – Building 50~~ [3]	~~N~~	~~Y~~	~~40 CFR 433.17~~	~~N~~	~~N~~	~~N~~	~~3829~~	~~Y~~
TOK America	Y	N	42 CFR Part 403.3 (v)(1)(ii)	N	N	N	2899	Y
Continental Coatings	N	N	40 CFR 433.17	Y	N	N	3479	N

Name of User	SIU (Y/N)	CIU (Y/N)	40 CFR Part No.	NDCIU (Y/N)	NSCIU (Y/N)	Middle Tier CIU (Y/N)	SIC Code or NAICS Code	Permit Issued (Y/N)
Engle Dental Systems	N	N	40 CFR 433.17	Y	N	N	3843	N
Finishing First Inc	N	N	40 CFR 433.17	Y	N	N	3479	N
Ichor Systems - Cal Weld	N	N	40 CFR 433.17	Y	N	N	3471	N
Integrated Metal Components	N	N	40 CFR 433.17	Y	N	N	3599	N
KAI Logistics	N	N	40 CFR 433.17	Y	N	N	3421	N
Meta Fab, Inc	N	N	40 CFR 433.17	Y	N	N	3479	N
Nortek Air Solutions, LLC	N	N	40 CFR 433.17	Y	N	N	3585	N
~~NW4S, Inc~~ [4]	~~N~~	~~N~~	~~40 CFR 433.17~~	~~N~~	~~Y~~	~~N~~	~~3469~~	~~N~~
NW Die Casting	N	N	40 CFR Part 464.12	Y	N	N	3363	N
Powder Tech, Inc.	N	N	40 CFR 433.17	Y	N	N	3479	N
~~Regenyx~~ [5]	~~N~~	~~N~~	~~40 CFR 414, Subpart F~~	~~Y~~	~~N~~	~~N~~	~~2869~~	~~N~~
St Jude Medical	N	N	40 CFR 463.16	Y	N	N	3643	N
Tufcoat ProPowder Powder Coating	N	N	40 CFR 433.17	Y	N	N	3479	N
Valmont Coatings Pacific States Galvanizing	N	N	40 CFR Part 433.17	Y	N	N	3479	N
Warne Scope Mounts	N	N	40 CFR Part 433.17	Y	N	N	3484	N

Name of User	SIU (Y/N)	CIU (Y/N)	40 CFR Part No.	NDCIU (Y/N)	NSCIU (Y/N)	Middle Tier CIU (Y/N)	SIC Code or NAICS Code	Permit Issued (Y/N)

Form 6 Comments

[1] BASF Corporation was previously permitted as a CIU for metal finishing. BASF consistently met the criteria for an NSCIU with annual certification in lieu of permit under the requirements listed in 40CFR403.3(v)(2). The facility is characterized as an NSCIU and the BASF CIU permit was terminated on Jan. 31, 2024.

[2] ACUMED, LLC – Brookwood Campus was previously permitted under a local program permit for ultrasonic parts washing of metal components. In 2024, the facility was in the process of moving passivation operations covered under the metal finishing subpart from the historically permitted ACUMED, LLC to the Brookwood location. The Brookwood location is permitted as a CIU for the newly moved processes pursuant to 40 CFR 433.17. Although permitted in 2024, the Brookwood location did not commence discharge from metal finishing operations during the calendar year due to required pretreatment systems installation.

[3] Tektronix – Building 50 ceased discharge on May 23, 2023; all chemicals were removed from facility on Jan. 13, 2024 and permit terminated.

[4] NW4S ceased operations. CWS conducted the final facility closure inspection on June 11, 2024. All production equipment, chemicals, and wastes were removed from the facility and the permit was terminated on June 14, 2024.

[5] Regenyx ceased operations. CWS conducted an initial facility closure inspection on Aug. 5, 2024, and the final facility closure inspection on Aug. 28, 2024. All production equipment, chemicals, and wastes were removed from the facility and the permit was terminated on Sept. 4, 2024.

Key

Underlined Name = New IU permitted in 2024

~~Strike through Name~~ = IU permit terminated

Middle Tier CIU Permit types have not been adopted by Clean Water Services

Form 6A – Industrial Survey Update

Name of Industry	Survey Returned (Y/N)	Permit Application Required (Y/N)	Permit Application Returned (Y/N)	Permit Issued (Y/N)	Comments
Eco Coatings NW	N	N	N	N	Facility has been contacted to submit a New Industrial User Questionnaire.
Banner Industries	N	N	N	N	Facility has been contacted to submit a New Industrial User Questionnaire.
Affiliated Resources	N	N	N	N	Facility has been contacted to submit a New Industrial User Questionnaire.
Q Pacific Manufacturing	N	N	N	N	Facility has been contacted to submit a New Industrial User Questionnaire.
HW Metals	Y	N	N	N	Evaluation in progress.
Apex Countertops	Y	N	N	N	Evaluation in progress.
ARCO - BP Products North America	Y	N	N	N	Evaluation in progress.
Streimer Sheet Metal Works, Inc	Y	N	N	N	Evaluation in progress.
Mt Hood Stone	Y	N	N	N	Evaluation in progress.
Agilyx	N	Y	N	N	Facility was identified in 2024 but submitted a survey and application in 2025. Materials are being evaluated for permitting requirements.
QTS	N	N	N	N	CWS will contact user in 2025.
Corfini Gourmet	N	N	N	N	Facility has been contacted to submit a New Industrial User Questionnaire.
A-dec, Inc	Y	Y	N	N	Discharge authorization issued stating no permit required.
ChemWest Systems	Y	N	N	N	Discharge authorization issued stating no permit required.
Sensoray	Y	Y	N	N	Discharge authorization issued stating no permit required.

Form 6A Comments

CWS Environmental Services (ES) program initiated continuous surveying efforts of its service area throughout 2024. Industrial users were identified through Sewer Use Information Cards that are provided to industrial users by cities, online New Industrial User Questionnaire's submitted by new businesses, currently identified users that hold a permit with CWS not previously permitted under a pretreatment control mechanism, and through windshield surveys and online mapping of businesses in the service area. In addition to surveying efforts, ES continued to update industrial user data that is stored in the Permit Information Management Software. ES staff screened its database for legacy surveyed and historically permitted facilities.

In 2024, ES staff inspected 27 legacy facilities; 13 of the 27 legacy facilities received a Discharge Authorization (no permit required letter) and the last 14 are currently under review. ES identified 48 additional legacy facilities that will be inspected in 2025. This continuous effort alongside surveying efforts of new users ensures that ES is continually conducting screening for all possible industrial users for local, state, and federal permitting requirements.

Form 7 – Compliance/Oversight Summary (SIUs Only)

Name of SIU	Permit Expiration Date	Number of Documented Inspections	POTW Sampling (All Regulated Pollutants)	SIU Self-Monitoring (All Regulated Pollutants)	SNC for Quarter			
					1	2	3	4
ACUMED, LLC - Brookwood Campus [1]	6/30/2029	1	0	0				
ACUMED, LLC.[2]	6/30/2029	1	1	1				
Analog Devices [3]	8/31/2025	2	1	0				
Anodize Solutions, LLC	10/31/2025	1	2	12				
BASF Corporation [4]	1/31/2024	1	1	1				
Davis Tool, Incorporated	5/31/2029	1	1	17				
Forest Dental Equipment	1/9/2029	1	1	2				
FormFactor, Inc	5/31/2029	1	1	2				
Fujimi Corporation [5]	4/27/2027	1	3	0				
Genentech, Inc.	10/29/2025	2	1	4				
Hillsboro Landfill Inc	2/28/2029	1	8	49				
Intel Corporation - Aloha Campus	10/31/2029	1	1	48				
Intel Corporation - Ronler Acres Campus	10/31/2028	1	1	2				
JAE Oregon Inc	1/22/2030	1	1	4				
Jireh Semiconductor, Incorporated [6]	6/7/2026	1	2	0				
KoMiCo Hillsboro, LLC	12/13/2026	1	1	11				
Lam Research Corp	6/30/2027	1	1	3				
Leupold & Stevens Inc [7]	11/5/2027	1	1	2	A			
Lieb Foods LLC	2/4/2029	3	1	2				
Lotus Applied Technology [2]	2/21/2026	1	1	1				
New Season Foods Incorporated	11/30/2029	4	2	123				
Northwest Rubber Extruders, Inc.	3/18/2026	1	1	2				
Old Trapper Smoked Products	10/31/2029	1	1	3				
Oregon Health Sciences University West Campus ONPRC [8]	7/31/2029	1	1	1				
Pacific Foods	9/30/2026	1	1	2				
Pacific Nutritional Foods	9/30/2028	1	1	2				
Pioneer Metal Finishing	1/23/2026	1	1	3				
Prudential Cleanroom Services	1/23/2026	1	1	2				
Qorvo	1/9/2029	1	1	4				
QuantumClean	11/30/2027	1	1	3				
Resers Fine Foods - Century Blvd Plant [9]	10/13/2025	2	4	0				

Name of SIU	Permit Expiration Date	Number of Documented Inspections	POTW Sampling (All Regulated Pollutants)	SIU Self-Monitoring (All Regulated Pollutants)	SNC for Quarter			
					1	2	3	4
Sheldon Manufacturing Incorporated	9/30/2027	1	1	2				
Sumitomo Electric Semiconductor Materials, Inc.	8/31/2028	3	2	13				
Summit Foods, Inc.	1/31/2029	3	1	2				
Tektronix Inc - Building 50 [10]	1/3/2024	0	0	0				
TOK America	8/11/2026	1	1	2				
TTM Technologies North America, LLC	9/30/2029	2	1	2				
Westak of Oregon Incorporated	2/1/2026	4	1	2				

Form 7 Comments

[1] The IU was permitted but did not start discharging from categorical processes in 2024.

[2] The IU monitored the categorical pretreatment limits twice but only sampled CWS Local Limits once due to midyear permit issuance.

[3] The IUs' only regulated pollutant is pH and Total Toxic Organics (TTO). Instead of TTO monitoring, the industry has an approved Toxic Organic Management Plan. Per DEQ guidance, continuous pH monitoring is not counted toward the total number of SIU samples. CWS collects pH grab samples at all industries and verifies the IUs' continuous pH monitoring systems. CWS verifies the accuracy of continuous monitoring systems upon inspection and verifies calibration schedule records. CWS samples all IUs' at least once for Local Limits and the IUs' monitored at least semiannually for Local Limits.

[4] BASF Corporation' CIU permit was terminated on Jan. 31, 2024. After review of the submitted Industrial Waste Discharge Application, BASF met the NSCIU requirements of 40CFR403.3(v)(2). BASF will submit an annual certification statement instead of permit. IU did not conduct self-monitoring due to permit termination on Jan. 31, 2024.

[5] The IUs' only regulated pollutant is pH. Per DEQ guidance, continuous pH monitoring is not counted toward the total number of SIU samples. CWS collects pH grab samples at all industries and verifies the IUs' continuous pH monitoring systems. CWS verifies the accuracy of continuous monitoring systems upon inspection and verifies calibration schedule records. CWS samples all IUs at least once for Local Limits. The IUs monitored at least semiannually for Local Limits.

[6] The IUs' only regulated pollutant is pH and Total Toxic Organics (TTO). Instead of TTO monitoring, the industry has an approved Toxic Organic Management Plan. Per DEQ guidance, continuous pH monitoring is not counted toward the total number of SIU samples. CWS collects pH grab samples at all industries and verifies the IUs' continuous pH monitoring systems. CWS verifies the accuracy of continuous monitoring systems upon inspection and verifies calibration schedule records. CWS samples all IUs at least once for Local Limits. The IU only monitored for CWS Local Limits once due to midyear permit issuance.

[7] The IU was in Significant Noncompliance (SNC) with applicable pretreatment standards and requirements in quarter 1. The IU was found to be in Technical Review Criteria SNC for daily maximum violation of the pretreatment standard for total molybdenum.

[8] The IU only monitored for Local Limits once due to midyear permit issuance.

[9] The IUs' only regulated pollutant is pH. Per DEQ guidance, continuous pH monitoring is not counted toward the total number of SIU samples. CWS collects pH grab samples at all industries and verifies the IUs' continuous pH monitoring systems. CWS verifies the accuracy of continuous monitoring systems upon inspection and verifies calibration schedule records. CWS sampled the IU once for Local Limits. The IU does not have monitoring requirements for Local Limits in the current permit. The permit will be amended in 2025 to include Local Limit monitoring requirements.

[10] Tektronix – Building 50 ceased discharge on May 23, 2023. All chemicals were removed from the facility on Jan. 3, 2024, and the permit was terminated on Jan. 3, 2024. The facility ceased discharging sooner than expected and before CWS sampling for the 2024 reporting year.

The following codes for SNC include:

A – SNC with Applicable Pretreatment Standards, B – SNC with Self-Monitoring, C – SNC with Reporting, D – SNC with Compliance Schedule.

Form 8 – Noncompliance/Enforcement Summary (SIUs Only)

Name of SIU	Nature of Violation	Date of Violation	POTW Enforcement Response	Date of POTW Response	Date of Return to Compliance	Comments
Analog Devices	Failure to Monitor for all Pollutants	12/31/2024	WLR	1/30/2025	1/27/2025	
Davis Tool, Incorporated	Self Monitoring Report (SMR) submitted later than report due date	11/11/2024	WLR	12/11/2024	12/6/2024	
FormFactor, Inc	Failure to Monitor for all Pollutants	12/31/2024	WLR	1/28/2025	2/10/2025	
Lieb Foods, LLC	Failure to Monitor Correctly or Improper Sampling	11/30/2024	WLR	12/23/2024	1/24/2025	
New Season Foods Incorporated	Exceeding Concentration Maximum Limit	9/1/2024	WLR	11/5/2024	9/24/2024	
	Exceeding Concentration Maximum Limit	9/2/2024				
	Exceeding Concentration Maximum Limit	9/18/2024				
	Exceeding Concentration Maximum Limit	9/23/2024				
New Season Foods Incorporated	Failure to Install, Operate or Maintain Mon Equip	11/19/2024	NOV	12/23/2024	11/25/2024	
	Exceeding Concentration Minimum Limit	11/19/2024				
	Exceeding Concentration Minimum Limit	11/24/2024				
New Season Foods Incorporated	Failure to Monitor for all Pollutants	12/31/2024	WLR	1/23/2025	2/18/2025	
Northwest Rubber Extruders, Inc.	SMR submitted later than report due date	3/12/2024	WLR	4/15/2024	4/8/2024	
Old Trapper Smoked Products	Exceeding Concentration Minimum Limit	1/7/2024	NOV	3/12/2024	1/8/2024	
Old Trapper Smoked Products	Exceeding Concentration Minimum Limit	9/29/2024	NOV	10/22/2024	10/1/2024	
	Exceeding Concentration Minimum Limit	9/30/2024				
Old Trapper Smoked Products	Reporting Violation	9/30/2024	NOV	10/22/2024	10/1/2024	
Old Trapper Smoked Products	Exceeding Concentration Minimum Limit	10/3/2024	NOV	12/4/2024	12/10/2024	

Name of SIU	Nature of Violation	Date of Violation	POTW Enforcement Response	Date of POTW Response	Date of Return to Compliance	Comments
	Reporting Violation	10/4/2024				
	SMR submitted later than report due date	11/12/2024				
Oregon Health Sciences University West Campus ONPRC	Failure to Install, Operate or Maintain Mon Equip	1/31/2024	NOV	2/19/2024	N/A [1]	See note below
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	2/2/2024	NOV	7/19/2024	N/A [1]	See note below
	Exceeding Concentration Maximum Limit	2/14/2024				
	Exceeding Concentration Maximum Limit	2/15/2024				
	Exceeding Concentration Maximum Limit	2/18/2024				
	Exceeding Concentration Maximum Limit	2/19/2024				
	Exceeding Concentration Maximum Limit	2/20/2024				
	Exceeding Concentration Maximum Limit	2/21/2024				
	Exceeding Concentration Minimum Limit	2/27/2024				
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Maximum Limit	3/1/2024	NOV	7/18/2024	N/A [1]	See note below
	Exceeding Concentration Maximum Limit	3/11/2024				
	Exceeding Concentration Maximum Limit	3/12/2024				
	Exceeding Concentration Maximum Limit	3/13/2024				
	Exceeding Concentration Maximum Limit	3/16/2024				
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Maximum Limit	3/20/2024	NOV	7/18/2024	N/A [1]	See note below
	Exceeding Concentration Minimum Limit	3/25/2024				

Name of SIU	Nature of Violation	Date of Violation	POTW Enforcement Response	Date of POTW Response	Date of Return to Compliance	Comments
	Exceeding Concentration Minimum Limit	3/26/2024				
	Exceeding Concentration Maximum Limit	3/26/2024				
	Exceeding Concentration Minimum Limit	3/27/2024				
	Exceeding Concentration Minimum Limit	3/28/2024				
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Maximum Limit	4/10/2024	NOV	7/18/2024	N/A [1]	See note below
	Exceeding Concentration Maximum Limit	4/12/2024				
	Exceeding Concentration Maximum Limit	4/13/2024				
	Exceeding Concentration Maximum Limit	4/15/2024				
	Exceeding Concentration Maximum Limit	4/18/2024				
	Exceeding Concentration Maximum Limit	4/18/2024				
	Exceeding Concentration Maximum Limit	4/20/2024				
	Exceeding Concentration Maximum Limit	4/20/2024				
	Exceeding Concentration Maximum Limit	4/21/2024				
	Exceeding Concentration Maximum Limit	4/21/2024				
	Exceeding Concentration Maximum Limit	4/22/2024				
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	4/29/2024	NOV	7/18/2024	N/A [1]	See note below
Oregon Health Sciences University West Campus ONPRC	Failure to Monitor for all Pollutants	4/29/2024	NOV	7/18/2024	N/A [1]	See note below
Oregon Health Sciences University West Campus ONPRC	Failure to Monitor Correctly or Improper Sampling	5/1/2024	NOV	10/14/2024	N/A [1]	See note below
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	6/24/2024	NOV	10/14/2024	N/A [1]	See note below
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Maximum Limit	7/17/2024	NOV	10/14/2024	N/A [1]	See note below

Name of SIU	Nature of Violation	Date of Violation	POTW Enforcement Response	Date of POTW Response	Date of Return to Compliance	Comments
	Exceeding Concentration Minimum Limit	7/24/2024				
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Maximum Limit	9/1/2024	NOV	10/14/2024	N/A [1]	See note below
	Exceeding Concentration Maximum Limit	9/2/2024				
Pioneer Metal Finishing	Reporting Violation	4/30/2024	WLR	6/7/2024	5/1/2024	
	Exceeding Concentration Minimum Limit					
Pioneer Metal Finishing	Exceeding Concentration Minimum Limit	5/22/2024	WLR	7/19/2024	5/23/2024	
	Reporting Violation					
Pioneer Metal Finishing	Failure to Monitor Correctly or Improper Sampling	7/31/2024	NOV	10/14/2024	8/1/2024	
Pioneer Metal Finishing	Exceeding Concentration Maximum Limit	9/5/2024	NOV	11/6/2024	9/6/2024	
	Reporting Violation	9/19/2024				
Pioneer Metal Finishing	Slug Discharge	10/23/2024	NOV	12/23/2024	11/7/2024	
Qorvo	Failure to Monitor for all Pollutants	2/29/2024	WLR	4/15/2024	3/5/2024	
QuantumClean	Exceeding Concentration Maximum Limit	6/18/2024	NOV	9/4/2024	7/3/2024	
	Exceeding Concentration Maximum Limit	6/18/2024				
	Exceeding Concentration Average Limit	6/30/2024				
QuantumClean	Exceeding Concentration Maximum Limit	7/26/2024	NOV	10/8/2024	8/2/2024	
	Exceeding Concentration Average Limit	7/31/2024				
QuantumClean	Failure to Monitor for all Pollutants	9/30/2024	WLR	1/30/2025	11/10/2024	
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	5/3/2024	NOV	5/14/2024	5/4/2024	
	Exceeding Concentration Maximum Limit					

Name of SIU	Nature of Violation	Date of Violation	POTW Enforcement Response	Date of POTW Response	Date of Return to Compliance	Comments
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	6/16/2024	NOV	7/30/2024	6/17/2024	
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	8/30/2024	NOV	9/17/2024	10/31/2024	
	Reporting Violation					
Summit Foods, Inc.	Failure to Monitor for all Pollutants	5/31/2024	WLR	6/25/2024	6/29/2024	
Summit Foods, Inc.	Failure to Monitor Correctly or Improper Sampling	7/31/2024	WLR	9/4/2024	9/16/2024	
Summit Foods, Inc.	Failure to Monitor Correctly or Improper Sampling	11/30/2024	NOV	12/23/2024	12/30/2024	
TOK America	Slug Discharge	6/26/2024	NOV	8/20/2024	6/27/2024	
	Exceeding Concentration Minimum Limit					
TOK America	Failure to Monitor Correctly or Improper Sampling	7/16/2024	WLR	10/17/2024	10/18/2024	
TTM Technologies North America, LLC	Failure to Monitor Correctly or Improper Sampling	9/11/2024	WLR	10/22/2024	10/1/2024	
	Reporting Violation	9/30/2024				
Westak of Oregon Incorporated	Exceeding Concentration Maximum Limit	5/22/2024	NOV	7/18/2024	5/23/2024	
Westak of Oregon Incorporated	Failure to Monitor Correctly or Improper Sampling	9/12/2024	NOV	1/30/2025	2/7/2025	

Form 8 Notes:

[1] Industrial User has not yet achieved final permit compliance. On March 24, 2025, the industrial user and CWS entered into a Mutal Agreement and Order for the timely completion of a pH pretreatment and monitoring system sufficient to achieve permit compliance

Form 9 – Resource Summary

Item	Report Year	Planned	Comments
Labor (billable hours)	**2024**	**2025**	
Sampling	1,022	1,500	Increased sampling projected for increased PFAS monitoring
Inspection	1,575	1,600	Increased inspection hours projected for extensive surveying efforts
Management	783	1,920	Increased management hours projected, assuming midyear hiring of 2 management vacancies
Administration	5,889	6,000	Increased administration hours projected, assuming all vacancies filled
Laboratory	786	875	Laboratory hours include sampling and analysis of industrial user samples to verify compliance and characterize pollutant loadings
Enforcement	640	640	Anticipating stabilized enforcement labor
TOTAL HOURS	**10,695**	**12,535**	
Operating Cost	**2024**	**2025**	
Laboratory	$69,655	$70,700	2025 increase reflects projected cost-of-living adjustment
Sampling and inspection	$206,591	$250,294	2025 increase for extensive surveying and monitoring efforts and cost-of-living adjustment
Permit writing	$262,475	$266,401	2025 increase reflects projected cost-of-living adjustment
Enforcement	$50,912	$51,673	2025 increase reflects projected cost-of-living adjustment
TOTAL COSTS ($)	**$589,633**	**$639,068**	
Income revenue	**2024**	**2025**	Income revenue reported reflects the income generated from pretreatment program activities used to fund or partially fund the pretreatment program
Sewer use	$16,338,001	$16,991,521	2025 increase reflects 4% average rate increase
Extra strength	$1,937,477	$2,014,976	2025 increase reflects 4% average rate increase
Impervious area	NA	NA	Income from impervious area charges does not fund or partially fund the pretreatment program
Penalties	$69,350	$6,600	Includes penalties assessed for all pretreatment enforcement responses (federal and local program permitting). $51,700 in penalties was assessed for federal program permitting. 2025 penalty amount reflects all pretreatment program penalties assessed at the time of report submission
TOTAL INCOME ($)	**$18,344,828**	**$19,013,097**	

Form 10 – Pretreatment Program Evaluation

1. Has a change in contributing jurisdictions occurred since the last Annual Report? ☐ Yes ☒ No
   If yes:

   _____

   _____

2. Has the Control Authority updated its Industrial User Survey to identify new Industrial Users (IUs) or changes in wastewater discharges at existing IUs? [(403.8(f)(2)(i)] ☐ Yes ☒ No
   If yes:

   _____

   _____

   a) Are any of these IUs located in new service areas (describe)? ☐ Yes ☒ No

   b) Have any IUs located in contributing jurisdictions where the POTW has no inter-jurisdictional agreements or IU Contracts? ☐ Yes ☒ No

   _____

   _____

3. For any <u>new</u> Categorical Industrial Users or processes identified during the Report period: ☒ Yes ☐ No

   a) Baseline Monitoring Report (BMR) Submitted? ☒ Yes ☐ No

   b) Final (90-day) Compliance Report (FCR) Submitted? ☐ Yes ☒ No

Notes: The 90-day Compliance Report has not been submitted for the new Categorical Industrial User, Acumed Brookwood, since the facility did not start discharging in 2024.

4. How many IUs are currently permitted, or identified by the Control Authority in each of the following categories during the Report period?

   36 TOTAL SIUs

   a) 25 Categorical Industrial Users (CIUs)

   b) 11 Significant Non-categorical IUs

   c) 0 NDCIUs subject to zero discharge limits

   d) N/A "Middle Tier" categorical industrial users

   14 NDCIUs that are not subject zero discharge categorical limits.

   4 Non-Significant Categorical Industrial User (NSCIU)*

   186 Other regulated non-categorical IUs (Describe):

   <u>Nonsignificant User (local cost recovery), Washwater, Discharge Authorization (no permit required letter), Best Management Practices, Liquid Waste Haulers, and FOG haulers.</u>

- ❖ For both NSCIUs and MTCIUs please indicate N/A if the POTW has NOT adopted these provisions. "0" if you have adopted provisions but do not currently permit any Ius as such)

5. Is the Control Authority's definition of "Significant Industrial User" the same as EPA's? [403.3(v)(1)(i-ii)] ☒ Yes ☐ No
   If not, the Control Authority has defined "Significant Industrial User" to mean:

   _____

   _____

6. How many SIUs are required to be covered by an individual control mechanism? 36

   How many SIUs are not covered by an existing, unexpired permit or other control mechanism? 0

   Explain:

   _____

   _____

7. Were individual control mechanisms issued/reissued for 90% of the SIUs within 180 days of the expiration date? ☒ Yes ☐ No

   How many control mechanisms were not issued within 180 days of the expiration date? 1

   Explain:

   One SIU permit was not issued within 180 days of expiration due to staffing changeover and additional time needed to evaluate permit requirements.

8. How many NDCIUs have been issued a control mechanism?

   a) How many NDCIUs subject to a zero-discharge prohibition have been issued a control mechanism? (Number/percent) N/A # N/A %

   b) How many NDCIUs NOT subject to a zero discharge and have been issued a control mechanism? 0 # 0 %

   c) Does the POTW require annual certification of NDCIUs in lieu of issuing a control mechanism? ☒ Yes ☐ No

   Comments, if any:

   Clean Water Services adopted the legal authority to include the NDCIU annual certification statement instead of issuing a control mechanism (i.e., permit). Clean Water Services continues to implement the adopted annual certification requirement in lieu of a permit.

9. Does the POTW accept hauled domestic waste? ☒ Yes ☐ No

10. Does the POTW accept hauled non-hazardous industrial waste? ☒ Yes ☐ No

11. Does the Control Authority have a control mechanism for regulating IUs whose waste are trucked to the treatment plant? ☒ Yes ☐ No

    If yes, does control mechanism designate a discharge point? ☒ Yes ☐ No

    (Describe):

    Clean Water Services designates the discharge point(s) for any permitted, trucked, or hauled waste approved for discharge through a CWS-issued control mechanism. CWS has a Hauled Waste Plan that describes permits, contracts, licensing, and authorization letters required to haul industrial waste.

12. Are all applicable categorical standards and local limits applied to IUs whose wastes are trucked into the POTW? ☒ Yes ☐ No ☐ N/A

    (Describe):

    Clean Water Services Non-Domestic Waste Ordinance-42 (NDWO-42) requires compliance with federal, state, and local discharge regulations for any discharge of nondomestic waste. The CWS-issued permits, contracts, and authorization letters require compliance with NDWO-42 including compliance with local limits. CWS completed local limit analysis of seven septage haulers for a total of 12 samples in November and December 2024. There are currently no CIUs applicable to categorical pretreatment standards or requirements that discharge hauled waste to CWS.

13. Has the Control Authority evaluated the need for SIUs to develop slug discharge control plans? [403.8(f)(2)(vi)] ☒ Yes ☐ No

    If yes, when was the evaluation last conducted and what criteria were used to identify the IUs for slug plans?

		During Report Period	Total
How many slug control plans:	Required?	19	29
	Received?	16	29
	Approved?	15	29
Notes: The evaluation is conducted in accordance with 40CFR403.8(f)(2)(vi) and under the criteria that SIUs, where there exists a potential to discharge slug loads to the POTW, are required to develop a slug discharge control plan.			

14. Are TTO standards or alternatives (solvent management plans or oil & grease monitoring) being implemented for IUs subject to TTO limitations? ☒ Yes ☐ No ☐ N/A

    If not, why?

    _____

    _____

    _____

Are TTO standards being applied to other IUs? ☐ Yes ☒ No ☐ N/A

15. How many times were the following monitored during the past year?

	Influent				Effluent				Sludge				Ambient (Receiving Water)
	DM	RC	HB	FG	DM	RC	HB	FG	DM	RC	HB	FG	
Metals	16	12	13	14	93	83	18[1]	58[2]	20	20	0[3]	0[3]	9[5]
Priority Poll.	0	0	0	0	7	7	7[4]	4[2]	0	0	0	0	1
Biomonitoring	-	-	-	-	2	3	2[4]	2[2]	-	-	-	-	-
TCLP	-	-	-	-	-	-	-	-	-	-	-	-	-
EP Tox	-	-	-	-	-	-	-	-	-	-	-	-	-
Other: Cyanide	12	12	9	9	13	12	6	12[2]	12	12	0[3]	0[3]	0

Notes:

1. Hillsboro discharges only during the high river flow period.
2. Combined Forest Grove effluent and Forest Grove NTS. Forest Grove NTS: Metals = 25, Priority = 4, Biomonitoring = 0, TCLP = 0, EP Tox = 0, Cyanide = 3.
3. Sludge from Hillsboro and Forest Grove is transferred to and included in Rock Creek analyses.
4. During low river flow conditions, effluent from Hillsboro and Forest Grove is directed through the Forest Grove NTS before discharge into the river. During such discharges, Forest Grove NTS effluent is representative of both Hillsboro and Forest Grove effluents.
5. Number of receiving water sampling events. Each event includes multiple sampling points. There are 4 ambient (receiving water) sampling locations, one associated with each of the 4 WRRFs. The number of samples taken and analyzed for metals at each site ranged from 9 – 24 depending on the seasonal discharge of the associated WRRF or coincidental routine or special projects.

16. Has the Control Authority had any problems performing compliance monitoring?
Scheduled: ☐ Yes ☒ No | Unscheduled: ☐ Yes ☒ No | Demand: ☐ Yes ☒ No

If yes, explain:

_____

_____

17. How many, and what percentage of SIUs were (a) not sampled at least once, or (b) not inspected at least once during the reporting period [403.8(f)(2)(vi)]

a) Number and % not sampled: 0 0%

b) Number and % not inspected: 0 0%

18. Does the Control Authority routinely split samples with industrial personnel?

a) If requested: ☒ Yes ☐ No

b) To verify IU self-monitoring: ☒ Yes ☐ No

19. Provide the following analytical information regarding pollutant analyses:

	Analytical Method	Name of Laboratory
Mercury	EPA 1631E, EPA 6020B	CWS Lab[1]
Other Metals	EPA 200.8 5.5, EPA 6020B	CWS Lab[1]
Cyanide	Kelada-01	CWS Lab[1]
Organics	EPA 420.1, EPA 601, EPA 624, EPA 625, EPA 8015B, EPA 8070D SIM, EPA 8081B, EPA 8082A, EPA 8151A, EPA 8260C, EPA 8270D, EPA 9065M	CWS Lab[1], ALS[2], APEX[3], Caltest[4]
Other:		

Notes:

1. CWS Lab = Clean Water Services Water Quality Laboratory
2. ALS = Australian Laboratory Services Environmental
3. APEX = Apex Laboratories
4. Caltest = Caltest Analytical Laboratory

20. Does the Control Authority use QA/QC for sampling and analysis? ☒ Yes ☐ No

    If yes, describe:
    Clean Water Service's Water Quality Laboratory maintains a comprehensive QA/QC program that complies with NPDES permit monitoring QA/QC requirements. Components of the program include a QA/QC Manager position, a QA/QC program document, written standard operating procedures for sampling and analysis, use of EPA-approved analytical methods and method QC requirements, analysis of commercially provided proficiency testing (PT) samples twice a year, PT acceptance criteria, and participation in the EPA's DMRQA program.

21. How much time normally elapses between sample collection and obtaining analytical results?

    1-3 weeks; varies by sample type and analysis.

22. Is there an established protocol clearly detailing sampling location and procedures? ☒ Yes ☐ No

23. How frequently does the Control Authority use the closed cup flashpoint test, specified in 40 CFR Part 261.21, to monitor SIUs? [403.5(b)(1)]

    ☐ Once per year

    ☐ Prior to each sampling

    ☒ Other:

    No SIUs discharge pollutants under 40 CFR 403.5(b)(1) that would require 40 CFR 261.21 testing. If testing becomes required, CWS would use a commercial laboratory as needed for testing frequency as required by individual permit.

    Did the Control Authority find any problems? ☐ Yes ☒ No

    If yes, explain:

    _____

    _____

24. Does the Control Authority compare all monitoring data to applicable pretreatment standards and requirements contained in the control mechanism within 15 days of its receipt? ☒ Yes ☐ No

25. Does the Control Authority use EPA's definition of Significant Noncompliance (SNC)? [403.8(f)(2)(viii)] ☒ Yes ☐ No

26. Are SIUs required to notify the Control Authority within 24 hours of becoming aware of a violation and to submit additional monitoring within 30 days after the violation is identified? [403.12(g)(2)] ☒ Yes ☐ No ☐ N/A

27. If the Control Authority conducts monitoring in lieu of the user, does the Control Authority resample and obtain results within 30 days of identifying and violation? ☐ Yes ☐ No ☒ N/A

28. Date that administrative penalties were last updated: November 10, 2020

29. Indicate the compliance/enforcement options that are available in the event of IU noncompliance

☒ Notice of Violation or Letter of Violation

☒ Compliance Schedule

☒ Injunctive Relief

☐ Imprisonment

☒ Termination of Service

☒ Administrative Order

☒ Revocation of Permit

☒ Fines (Maximum Amount)

a Civil N/A /day/violation

b Criminal NA /day/violation

c Administrative $5,000 /day/violation

Notes:

a. Civil * Civil judicial enforcement. CWS is authorized to take any action provided by law to enforce CWS rules or collect any monies owed to CWS as a result of enforcement actions taken under CWS rules.

b. Criminal * CWS is authorized to refer violations of CWS rules to the proper authorities for investigation and enforcement as criminal matters. Pursuant to ORS 198.600, violation of CWS rules is a Class C misdemeanor.

30. For each of the listed enforcement actions, identify the following for the ones the Control Authority has used during the reporting period

	Total # of Actions	# of Industries Affected
Written notice or letter of violation	40	16
Administrative orders	0	0
Administrative fines	22	9
Show cause hearings	0	0
Compliance orders	0	0
Permit revocation	0	0
Civil action	0	0
Criminal action	0	0
Termination of service	0	0
Other (specify): Consent order	1	1
Notes: Warning letters are informal enforcement actions and are included as a written notice. There were 15 informal enforcement actions and 25 Notice of Violation actions. 22 enforcement actions included administrative fines. Three Notice of Violations had penalties that were stayed as part of a Mutual Agreement and Order and were not included as an action with administrative fines. Enforcement actions above include those CWS has taken for SIUs only.		

31. For each of the listed enforcement actions, identify the following for the ones the Control Authority has used during the reporting period:

	Number	Amount ($)
Civil	None	None
Administrative	22	$51,700
Total	22	$51,700
Notes: Enforcement actions above are for SIUs only. See Form 9 for all pretreatment program penalties assessed.		

32. Indicate the number and percent of SIUs that were identified as being in SNC (as defined by EPA) with the following during the reporting period:

		# of SNC SIUs	% of SNC SIUs
Applicable pretreatment standards	1	1	3%
Self-monitoring requirements	0	0	0%
Reporting requirements	0	0	0%
Pretreatment compliance schedule	0	0	0%
Other:	0	0	0%

33. Did the Control Authority publish all SIUs in SNC in newspapers, or general arbitration that provides meaningful public notice within the instructions served by the POTW? [403.8(f)(2)(vii)] ☒ Yes ☐ No

    If yes, attach copy, or attach copy of affidavit of publication.

    Notes: One SIU was identified as being in SNC in 2024 for technical review criteria violation of the pretreatment standard for total molybdenum. The publication notice was published in The Oregonian (see Form 10 attachment).

34. Indicate the number of SIUs that are currently in SNC with self-monitoring and were not inspected or sampled: 0

35. How many SIUs are currently on compliance schedules in order to meet new or revised national pretreatment standards or requirements? 0

36. Have any CIUs been allowed more than 3 years from the effective date of a categorical standard to achieve compliance? [403.6(b)] ☐ Yes ☒ No

37. Have any IUs requested that data be held confidential? ☒ Yes ☐ No

38. Have any requests been made by the public to review files? ☒ Yes ☐ No

39. Are all records maintained for at least 3 years? ☒ Yes ☐ No

40. Are there significant public or community issues impacting the POTW's pretreatment program? ☐ Yes ☒ No

    If yes, explain:

    _____

    _____

41. Have any problems in program implementation been observed which appear to be related to inadequate funding, resources, or staff? ☐ Yes ☒ No

    If yes, explain:

    _____

42. Does the Control Authority have adequate resources to implement the pretreatment program? ☒ Yes ☐ No

43. Does the Control Authority have the technical documents necessary for implementing its pretreatment program ☒ Yes ☐ No

44. Does the Control Authority have access to adequate:

	Yes	No	Explain:
Sampling equipment	X		
Safety equipment	X		
Vehicles	X		
Analytical equipment	X		

Form 10 Attachments – CWS Public Notice of SNC

Public Notice of Industrial User in Significant Noncompliance

Clean Water Services (CWS) administers the federal Industrial Pretreatment Program to regulate discharges of industrial wastewater to the sanitary sewer system. It is a requirement of federal regulation 40 CFR 403.8(f)(2)(viii) and Nondomestic Waste Ordinance 42 that CWS publish a list of industrial users that were in Significant Noncompliance (SNC) with applicable Pretreatment Program requirements annually. Listed below are those industrial facilities that discharge industrial wastewater into CWS Publicly Owned Treatment Works and were found to be in Significant Noncompliance in the 2024 calendar year. Any questions should be directed to Jamie Hughes, Program Manager 3 & Interim Environmental Services Manager, at 503.681.4456.

Leupold & Stevens
14400 NW Greenbrier Pkwy
Beaverton, OR 97006

Violation:

Leupold & Stevens, Inc. was found to be in Technical Review Criteria Significant Noncompliance for daily maximum violations of the pretreatment standard for total molybdenum.

CWS Enforcement Action:

Leupold & Stevens, Inc. was issued a Notice of Violation on January 19, 2024.

Current Compliance Status:

At the time of this publication Leupold & Stevens, Inc. voluntarily returned to compliance in January 2024.

Form 10 Attachments – SNC Final Publication in The Oregonian Legal Affidavit

The Oregonian OREGONLIVE.COM
OREGONIAN MEDIA GROUP

Oregonian

LEGAL AFFIDAVIT

AD#: 0010968455

State of Oregon,) ss
County of Multnomah)

Stacey Tredici being duly sworn, deposes that he/she is principal clerk of Oregonian Media Group; that Oregonian is a public newspaper published in the city of Portland, with general circulation in Oregon, and this notice is an accurate and true copy of this notice as printed in said newspaper, was printed and published in the regular edition and issue of said newspaper on the following date(s):

Oregonian 02/21/2025

Stacey Tredici

Principal Clerk of the Publisher

KIMBERLEE WRIGHT O'NEILL
NOTARY PUBLIC - OREGON
COMMISSION NO. 1026818
MY COMMISSION EXPIRES 08/15/2026

Sworn to and subscribed before me this 25th day of February 2025

Online Notary Public. This notarial act involved the use of online audio/video communication technology. Notarization facilitated by SIGNiX®

Kimberlee Wright O'Neill

Notary Public

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CWS Enforcement Action:
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Current Compliance Status:
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Form 11 – Sewage Treatment Plant Profile(s)

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number: NPDES #101141: Durham Water Resource Recovery Facility

1. Treatment Plant Design Dry Weather Flow (MGD) 25.7
2. Treatment Plant Actual Dry Weather Flow (Ave.) (MGD) 20.6

3. Treatment Plant Design Wet Weather Flow (MGD) 42
4. Treatment Plant Actual Peak Wet Weather Flow (MGD) 72.0
5. Sewerage System:
   a) Separate (%) 100%
   b) Combined (%) 0%
   c) Number of CSOs 0
6. Industrial Contribution
   a) Flow (MGD) 0.99
   b) % of Influent 4.81% of actual dry weather flow
   c) Number of contributing SIUs (non-CIUs) 3
   d) Number of contributing CIUs 7
7. Level of Treatment and Description
   a) Preliminary ☒ 6 influent pumps followed by 4 bar screens and grit basins
   b) Primary ☒ 4 primary clarifiers
   c) Secondary ☒ 5 aeration basins with secondary clarifiers
   d) Tertiary ☒ 3 chemical clarifiers followed by 13 mixed media filters
   e) Type of Disinfection ☒ sodium hypochlorite
8. Receiving Water
   a. Name: Tualatin River
   b. Classification (NPDES/WPCF Permit Hydro Code): 22M-TUAL 9.2D
   c. Designated Beneficial Uses (OAR 340-41 Basin Standards): All but commercial navigation and transport
9. Effluent Discharged to Any Location Other than Receiving Water? ☒ Yes ☐ No

If yes, Indicate Where, When, and Describe:

Class A recycled water is produced May to October and distributed to 3 golf courses (Tualatin, King City, and Summerfield), 2 schools (Durham Elementary and Tigard High athletic fields), 2 parks (Durham City and Tigard Cook), and 2 other properties (Thomas Dairy, a CWS-owned natural area, and Hickox, a privately owned farm).

10. Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)
    a. Land Application: 4,322 dry tons/ year*
    b. Municipal Solid Waste Landfill: 0
    c. Sale or Donation to Public: 0

Other (Specify): NA

*Note: US dry tons/year for land application is provided. CWS is unclear what number is being asked, as Mg/Kg/Year for all regulated concentrations are reported in the biosolids annual report.

Form 11 – Sewage Treatment Plant Profile(s)

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number: NPDES #101142: Forest Grove Water Resource Recovery Facility

1. Treatment Plant Design Dry Weather Flow (MGD) 6.3
2. Treatment Plant Actual Dry Weather Flow (Ave.) (MGD) 4.3
3. Treatment Plant Design Wet Weather Flow (MGD) 7.8
4. Treatment Plant Actual Peak Wet Weather Flow (MGD) 17.5
5. Sewerage System
   a) Separate (%) 100%
   b) Combined (%) 0%
   c) Number of CSOs 0
6. Industrial Contribution
   a) Flow (MGD) 0.19 MGD
   b) % of Influent 4.42% of actual dry weather flow
   c) Number of contributing SIUs (non-CIUs) 3
   d) Number of contributing CIUs 1
7. Level of Treatment and Description
   a) Preliminary ☒ 2 bar screens, 2 grit removal units
   b) Primary ☐ None
   c) Secondary ☒ 2 aeration basins followed by 3 secondary clarifiers
   d) Tertiary ☒ Seasonal Natural Treatment System (May – October)
   e) Type of Disinfection ☒ UV bank with 2 banks per channel, 2 channels; increased to 5 vessels in October 2023
8. Receiving Water
   a. Name: Tualatin River
   b. Classification (NPDES/WPCF Permit Hydro Code): 22M-TUAL 53.8D
   c. Designated Beneficial Uses (OAR 340-41 Basin Standards): All but commercial navigation and transport
9. Effluent Discharged to Any Location Other than Receiving Water? ☐ Yes ☒ No

If yes, Indicate Where, When, and Describe:

10. Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)
    a. Land Application NA
    b. Municipal Solid Waste Landfill NA
    c. Sale or Donation to Public NA

Other (Specify) NA; all solids are transferred to and processed at Rock Creek WRRF

Form 11 – Sewage Treatment Plant Profile(s)

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number: NPDES #101143: Hillsboro Water Resource Recovery Facility

1. Treatment Plant Design Dry Weather Flow (MGD) No dry weather discharge; flow sent to Rock Creek/Forest Grove facilities
2. Treatment Plant Actual Dry Weather Flow (Ave.) (MGD) 3.3
3. Treatment Plant Design Wet Weather Flow (MGD) 7.8
4. Treatment Plant Actual Peak Wet Weather Flow (MGD) 17.8
5. Sewerage System:
   a) Separate (%) 100%
   b) Combined (%) 0%
   c) Number of CSOs 0
6. Industrial Contribution
   a) Flow (MGD) 0.11 MGD
   b) % of Influent 3.33% of actual dry weather flow
   c) Number of contributing SIUs (non-CIUs) 2
   d) Number of contributing CIUs 3
7. Level of Treatment and Description
   a) Preliminary ☒ 2 bar screens, 2 grit removal units
   b) Primary ☒ 2 circular clarifiers
   c) Secondary ☒ 1 aeration basin, 3 secondaries
   d) Tertiary ☐ None
   e) Type of Disinfection ☒ UV, 1 bank per channel, 2 channels
8. Receiving Water
   a. Name: Tualatin River
   b. Classification (NPDES/WPCF Permit Hydro Code): 22M-TUAL 42.9 D, 22M-TUAL 43.3
   c. Designated Beneficial Uses (OAR 340-41 Basin Standards): All but commercial navigation and transportation
9. Effluent Discharged to Any Location Other than Receiving Water? ☐ Yes ☒ No
10. Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)

a) Land Application NA

b) Municipal Solid Waste Landfill NA

c) Sale or Donation to Public NA

Other (Specify) N/A; all solids are transferred to, processed at Rock Creek WRRF

Form 11 – Sewage Treatment Plant Profile(s)

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number: NPDES #101144: Rock Creek Water Resource Recovery Facility

1. Treatment Plant Design Dry Weather Flow (MGD) 46.4
2. Treatment Plant Actual Dry Weather Flow (Ave.) (MGD) 32.0
3. Treatment Plant Design Wet Weather Flow (MGD) 68.4
4. Treatment Plant Actual Peak Wet Weather Flow (MGD) 106.3
5. Sewerage System:
   a) Separate (%) 100%
   b) Combined (%) 0%
   c) Number of CSOs 0
6. Industrial Contribution
   a) Flow (MGD) 7.19 MGD
   b) % of Influent 22.5% of actual dry weather flow
   c) Number of contributing SIUs (non-CIUs) 4
   d) Number of contributing CIUs 14
7. Level of Treatment and Description
   a) Preliminary ☒ 4 fine bar screens, 2 grit removal units, 3 primary fibrous removal systems.
   b) Primary ☒ 3 circular clarifiers
   c) Secondary ☒ 6 parallel aeration basins, 10 clarifiers
   d) Tertiary ☒ 4 chemical clarifiers, 2 direct filtration channels, 2 high rate clarifiers, 10 filters, 3 contact basins
   e) Type of Disinfection ☒ chlorination with hypochlorite
8. Receiving Water
   a. Name: Tualatin River
   b. Classification (NPDES/WPCF Permit Hydro Code): 22M-TUAL 37.7 D
   c. Designated Beneficial Uses (OAR 340-41 Basin Standards): All but commercial navigation and transportation.
9. Effluent Discharged to Any Location Other than Receiving Water? ☒ Yes ☐ No

If yes, Indicate Where, When, and Describe: Class A recycled water is produced May to October and distributed to 1 golf course. (The Reserve Vineyard and Golf Club).

10. Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)

a) Land Application: 6,270 dry tons/year*

b) Municipal Solid Waste Landfill: 0

c) Sale or Donation to Public: 0

d) Other (Specify): NA

* Note: Units provided are U.S. dry tons/year for land application; unclear what number is being asked as Mg/Kg/Year for all regulated concentrations are reported in the annual biosolids reports.

Form 12 – Pretreatment Program Profile(s)

1. Information pertaining to contributing jurisdictions (Complete for each jurisdiction)

a) Name of contributing jurisdiction: City of Portland

DEQ approved IJA or IGS	☒ Yes ☐ No
Date approved by DEQ:	NA
Date incorporated into NPDES/WPCF permit:	July 20, 1999
Number of CIUs in contributing jurisdiction	Zero (0)
Number of other SIUs in contributing jurisdiction	Zero (0) [1]

[1] The one SIU in the contributing jurisdiction ceased discharging in March 2024 and the SIU permit was revoked on April 16, 2024. Facilities within the City of Portland's jurisdiction discharge to CWS' conveyance system only during City of Portland's Fanno Creek pump station emergency bypass situations and coordinated maintenance events, such as flow meter calibration and gate exercising events. There were no emergency bypass situations in 2024.

b) Name of contributing jurisdiction: City of Tualatin and City of Lake Oswego

DEQ approved IJA or IGS	☒ Yes ☐ No
Date approved by DEQ:	NA
Date incorporated into NPDES/WPCF permit:	2011 [1]
Number of CIUs in contributing jurisdiction	0
Number of other SIUs in contributing jurisdiction	0

[1] CWS has an intergovernmental agreement (IGA) with the City of Tualatin and the City of Lake Oswego to maintain a pump station on Childs Road, which directs all flows to the City of Portland. The IGA includes information on the area of sewage flow that drains by gravity to CWS that is within and outside of CWS' service area. DEQ issued CWS an NPDES permit that became effective on Jan. 1, 2023. CWS began updating the IGAs with all co-implementer cities. CWS intends to update the IGAs, including those with the City of Tualatin and City of Lake Oswego, which will complete the required Finding A.2 of the Final Pretreatment Audit Report.

c) If relying on contributing jurisdictions, indicate, for each, which activities they are required to perform:

Name: City of Portland

- ☒ Industrial Waste Survey (IWS) ->See memo from City of Portland attached to Form 12
- ☒ Permit Issuance
- ☒ Inspection Sampling Enforcement
- ☐ Notification of Industrial Users (IUs) of Pretreatment Requirements
- ☐ Receipt and Review of IU Reports
- ☒ Analysis of Samples
- ☒ Other (Specify): Review agreement annually on or before February 1st

2. Indicate approved pretreatment program compliance and inspection frequency requirements:
    a) Inspections
        1. CIUs 1 x per year
        2. Other SIUs 1 x per year
    b) Sampling by Control Authority (i.e., the municipality or POTW)
        1. CIUs 1 x per year
        2. Other SIUs 1 x per year
    c) Industrial user (IU) self-monitoring
        1. CIUs 2 x per year
        2. Other SIUs 2 x per year
    d) Reporting by IUs
        1. Other CIUs monthly
        2. Other SIUs monthly
    3. Removal Credits:
        a) Is the Control Authority currently authorized to issue removal credits? ☐ Yes ☒ No
        b) Has the POTW applied for authorization to issue removal credits? ☐ Yes ☒ No

        Date: N/A
        c) Has the Control Authority issued any removal credits? ☐ Yes ☒ No

        Date: N/A
        d) Date of most recent removal credits approval (if applicable): Date: N/A
    4. Is any part of the pretreatment program being operated under any pretreatment-related consent decree, administrative order, compliance schedule, or other enforcement action?

If yes, explain: No.

5. List effluent and sludge quality

List NPDES/WPCF Permit effluent and biosolids limits violated and suspected causes:

Parameters Violated/Date	**Cause(s)**
January 18, 2024: Warning Letter – The reported daily maximum TSS loading of 35,650.0 lb/d exceeds the permit limit of 34,000.0 lb/d by 4.0%	TSS was elevated from rain, ice, and snow on January 17-18, 2024, which significantly increased flows. A process failure related to exceptional cold weather created a series of difficult operational responses and contributed to the elevated TSS.
February 06, 2024: Warning Letter – The reported daily maximum pH of 9.2 S.U. violates the permit limit of 9.0 S.U. by 0.2 S.U.	Excursion was due to fluctuating pH levels in the sample stilling well during the morning reading.

6. Have treatment plant biosolids violated any TCLP tests? ☐ Yes ☒ No

If Yes, Explain:

NA

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers

Industrial Pretreatment and Permitting
Environmental Services Water Pollution Control Laboratory
6543 N Burlington Ave | Portland, OR 97203-5452
503-823-5600 | IndustrialPermitting@portlandoregon.gov

Clean Water Services Industrial Pretreatment Program

To: Clean Water Services Pretreatment Program

From: Dickmeyer, Ben

CC: Matt Criblez

Date: 02/20/2024

Re: Pretreatment Program Implementation Agreement 2024 Industrial User Survey

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Comments: The City of Portland (the City) and Clean Water Services (the Agency) Pretreatment Program Implementation Agreement establishes the City as the administrator of the NPDES required Industrial User survey in those areas of the City that discharge wastewater to the Agency's sanitary sewer system.

On November 5, 2024, the City conducted a drive through inspection of the area with the purpose of identifying industrial users that would be required to complete a City of Portland Industrial User survey. The City uses the following criteria to determine those businesses that require a survey.

- Are subject to categorical pretreatment standards and discharge regulated wastewaters to the sewer system, or
- Discharge 25,000 gallons per day or greater of process wastewater to the sewer system, or
- Are subject to a "zero-discharge" categorical pretreatment standard, or
- Are designated as such by the Industrial Pretreatment Program (IPP) Manager due to the nature of the IU's discharge to adversely impact the sewer system.

During the November 5, 2024 drive through, the City identified no businesses meeting those criteria and no connections.

For any further information or questions, please contact me at ben.dickmeyer@portlandoregon.gov, or 971-990-8852.

Respectfully,

Ben Dickmeyer
Environmental Survey Program
Bureau of Environmental Services

Form 13 – Pretreatment Data Summary Sheet

Form/Question	Question	
Form 2 Question 6	Date of Most Recent Technical Evaluation for Local Limits?	May 28, 2021
	Date of Most Recent Adoption of Technically Based Local Limits?	February 28, 2022
	Local Limit Pollutants?	As, Cd, Cr, Cu, Cyanide, Pb, Hg, Mo, Ni, Se, Ag, Zn, pH, FOG/BMP
Form 10 Question 4	Has City adopted NSCIU/MTCIU?	NSCIU only
	Number of SIUs	36
	Number of CIUs	25
	Number of Non Categorical SIUs	11
	Number of NDCIU subject to zero discharge?	0
	Number of NDCIU NOT subject to zero discharge?	14
	Number of NSCIU?	4
	Other Permitted IUs (not SIUs or CIUs)	186
Form 10 Question 6	SIUs Without Control Mechanism?	0
Form 10 Question 9	Acceptance of Hauled Domestic Wastes	☒ Yes ☐ No
Form 10 Question 10	Acceptance of Non-Hazardous Industrial Wastes?	☒ Yes ☐ No
Form 10 Question 17	SIUs Not Sampled?	0
	SIUs not Inspected?	0
Form 10 Question 30	Violation Notices Issued to SIUs?	40* Includes WLs
	Administrative Orders Issued to SIUs?	0

	Civil Suits Filed Against SIUs?	0
	Criminal Suits Filed Against SIUs?	0
Form10_Q31	Industrial Users (IUs) from which Penalties have been collected?	9
	Dollar Amount of Penalties Collected?	$51,700 *Includes SIUs only. See Form 9 for all PT program penalties assessed
Form 10 Question 32	SIUs in SNC with Pretreatment Standards?	1
	SIUs in SNC with Self-Monitoring Standards?	0
	SIUs in SNC with Reporting Requirements?	0
	SIUs in SNC with Pretreatment Compliance Schedule?	0
Form 10 Question 33	SIUs in SNC Published in Newspaper?	1
	Removal Credits Application Status?	None
Form 12 Question 3	Date of Most Recent Removal Credits Approval?	NA
	Removal Credits	None

Attachments

Form 13 Excel version

Form 13 Excel version is included as an attachment.

Appendix A: NTS Metals Data

NTS Metals Data required by Table B8 in the NPDES permit are included in Form 3 of this Pretreatment Annual Report.

Appendix B: Mercury Data

Mercury data required by Tables B4 – B7 in the NPDES permit are included in Form 3 of this Pretreatment Annual Report.

Summary of mercury reduction activities implemented: Environmental Services staff inspected 13 dental offices and provided onsite technical support for facilities that were in noncompliance to meet Best Management Practices (BMPs). CWS confirmed one-time compliance reports were submitted for federal documentation. BMPs include proper maintenance of the amalgam separator, proper disposal of materials containing amalgam, and nonoxidizing vacuum line cleaners.

Environmental Services staff worked with four major hospitals in CWS' jurisdiction to identify areas of mercury exposure and potential reduction opportunities. Each hospital completed a mercury evaluation checklist to assess the potential mercury risk of different units in the hospital. BMPs were supplied and adopted by the hospitals in response to CWS' pollution prevention efforts. In addition to the reduction activities summarized here, CWS also submitted a summary of reduction activities related to MS4 and ambient watershed monitoring as part of the MS4 Annual Report submitted on November 1, 2024. CWS provides updates and additional content in the MS4 Annual Report on an annual basis.

Appendix C: PFAS Data Update

PFAS Summary

Since 2019, Clean Water Services (CWS) has been conducting regular PFAS monitoring at each of the four water resource recovery facilities (WRRFs) and contributing industries to identify PFAS. Over the past five years, CWS has collected 60 effluent samples, 67 influent samples, and 227 industrial user (IU) samples. CWS' quarterly PFAS sampling of each WRRF and selected key industries is ongoing. In addition to routine WRRF and industrial monitoring, CWS intends to expand its monitoring efforts to include commercial users. In 2024, Environmental Services (ES) conducted extensive literature reviews to inform CWS on potential PFAS discharges from commercial sources and identified priority commercial sectors for sampling and outreach efforts in the upcoming calendar year.

Influent, Effluent, and Biosolids Sampling at the Water Resource Recovery Facilities

Influent and effluent samples are collected at each WRRF every quarter, if available; biosolids are also collected at the Rock Creek and Durham facilities. Influent is collected upon entry at the facility, before any treatment; effluent is collected when all treatment is complete, before exiting the facility. In general, most PFAS were below detectable concentrations with only a handful of samples having quantifiable concentrations for influent, effluent, and biosolids. On average, effluent concentrations from the four WRRFs are less than the effluent nationwide average (effluent with and without contribution from industries) for most compounds (Figure 1).

Biosolids concentrations for most compounds that were quantifiable were very low (ND – 17 ng/g), except for 5:3 FTCA. Average PFOS and PFOA concentrations at Rock Creek (15 and 1 ng/g, respectively) and Durham (12 and 2 ng/g, respectively) are both lower than the nationwide average (233 and 24 ng/g, respectively).[1] When looking at median concentrations from the nation, CWS' biosolids concentrations were on par with the median (e.g., 13 ng/g for PFOS).[1]

Monitoring Industrial Users

Since the last update, CWS continued efforts to understand the concentration and mass loading of PFAS discharged from IUs. Quarterly monitoring of select IUs has been modified to include additional IUs in the high-priority semiconductor and chemical blending sectors. In addition to the newly included IUs in quarterly sampling initiatives, CWS is continuing to monitor those industries historically identified as having the highest identified concentrations or mass loadings of PFAS. One priority IU that has been sampled since 2019 will be removed from the recurring quarterly analysis starting in the first quarter of 2025. The facility has been submitting PFAS analysis data quarterly since 2019 per the site-specific PFAS Management Plan, which was required by the IU permit in 2020. IU sample results have been in line with CWS sample results. An additional IU will be sampled quarterly in its place.

In 2024, CWS implemented PFAS monitoring of IUs that have not been selected for quarterly analysis to capture a larger variety of potential industrial sources of PFAS. These sites have either been sampled once in 2019 or have never been sampled. The results of the PFAS monitoring will be used to amend the IU list for ongoing CWS quarterly analysis and to ensure the quarterly monitoring list accurately reflects the high-priority IUs in CWS' service area and the identified priority locations are monitored routinely.

Sample results since 2019 are being analyzed to screen for the stability of PFAS concentrations over time. CWS has seen success in its source control efforts as PFAS mass discharged from industrial sources has been decreasing. The largest industrial sources of PFAS were removed; now most of the PFAS coming into the WRRFs are from residential and commercial sources (Figure 2). Additional source control efforts will reduce the remaining mass of PFAS discharged from IUs.

Future source control efforts will be through a sector-specific outreach campaign. Nondomestic users that have been identified as priority sectors will receive the first round of outreach materials by June 2026. Ongoing statistical analysis of routine sewershed PFAS monitoring will inform CWS on the effectiveness of its outreach efforts including:

- Requiring PFAS Management Plans for all reporting industries.
- Discussions surrounding potential PFAS legislation and updates during annual compliance inspections.

Clean Water Services plans to develop sector-specific outreach materials including:

- Resources and identification of specific PFAS sources reported by IUs through PFAS Management Plan implementation.
- Information cited in literature reviews.

CWS will develop an initial round of PFAS outreach materials for the following priority sectors:

- Industrial: semiconductor and metal finishing.
- Commercial: autobody and automotive shops.
- Nondomestic: general outreach targeted towards residential users.

Figure 1: CWS PFAS Compounds and Concentrations by WRRF with Nationwide Average

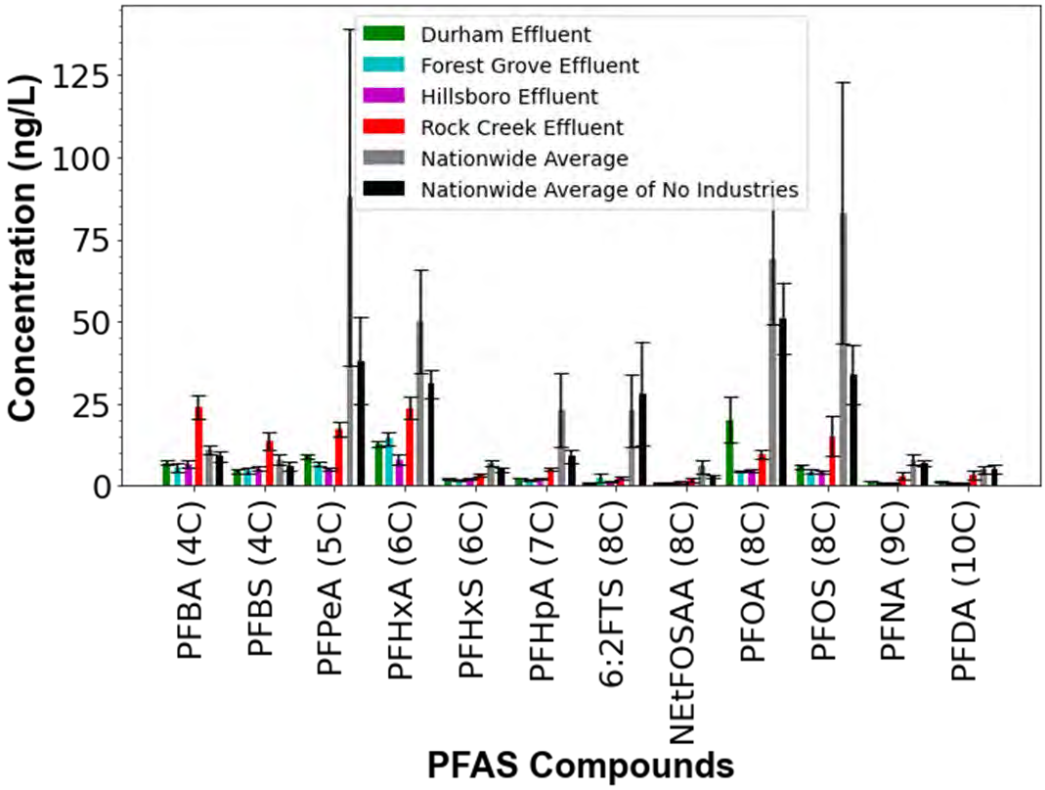
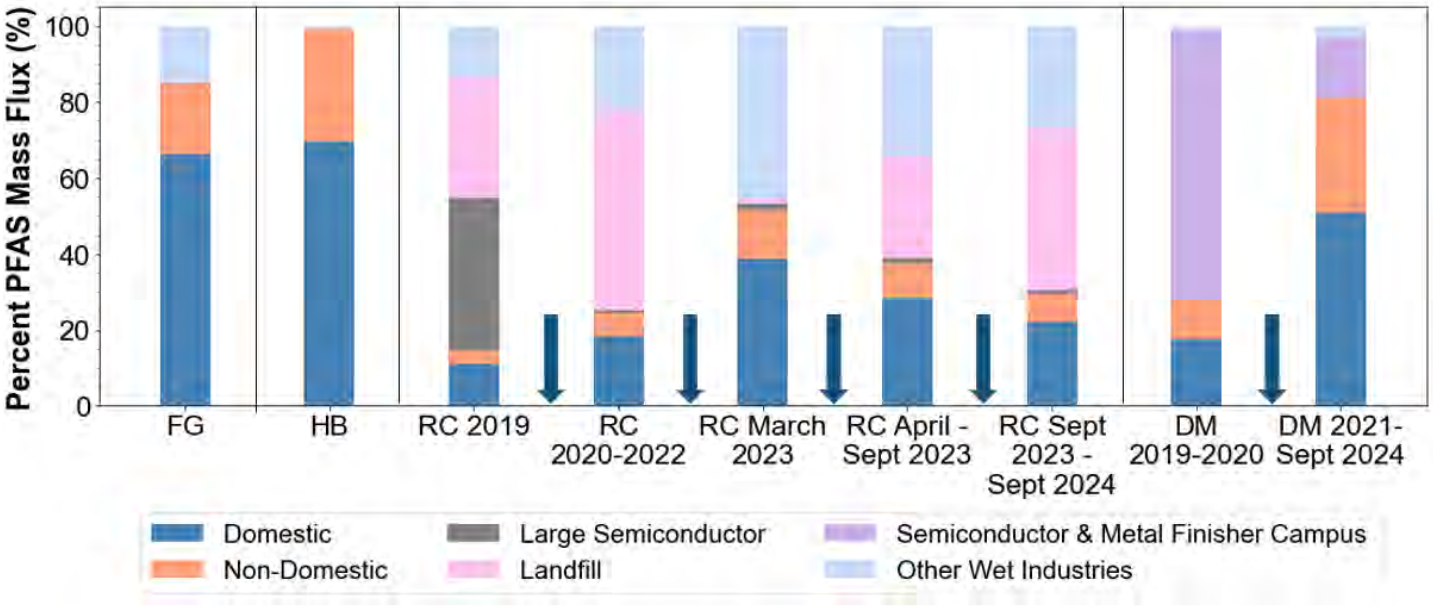


Figure 2: Sector PFAS Mass Contribution to Each WRRF by Time Period



References

[1] Thompson, K. A.; Mortazavian, S.; Gonzalez, D. J.; Bott, C.; Hooper, J.; Schaefer, C..; Dickenson, E. R. V. Poly- and Perfluoroalkyl Substances in Municipal Wastewater Treatment Plants in the United States: Seasonal Patterns and Meta-Analysis of Long-Term Trends and Average Concentrations. EST Waters 2022, 2 (5), 690– 700, DOI: 10.1021/acsestwater.1c00377

Appendix D: Hauled Waste Annual Report

The table below shows the types of hauled waste accepted at each designated discharge point in the CWS collection system and summarizes the volume accepted in 2024. The report of the date, time, type, and amount received each time CWS accepts hauled waste is attached electronically, as the report contains thousands of records.

2024 Hauled Waste Annual Report Summary

Designated discharge point	Type	2024 Amount (Gallons)
Durham WRRF	FOG	12,569,811
Durham WRRF	Septage	11,888,613
Durham WRRF	Grey water and RV	166,890
Rock Creek WRRF	Industrial/high strength waste (HSW) for resource recovery	259,792 (HSW)
Rock Creek WRRF	Septage	Measured amount [1]: 226,844
		Total amount (approximated) [2]: 2,069,296
Rock Creek WRRF	Grey water and RV	49,470
Material Processing Yard	Decant	Not measured [3]

Notes

[1] The amount that was measurable through the automatic system has been reported electronically.

[2] The automatic flow measurement system in 2024 was offline periodically for maintenance and repair. The total amount was approximated using billing records. The hauled waste manifests have been provided as PDF attachments that include the date, time, amount, type, and discharge location each time the Rock Creek Septage Receiving station received hauled waste.

[3] The amount from decant processes is not measured currently, as stated in the CWS Hauled Waste Control Plan.

2025 Annual Report

Water Quality Credit Trading

Clean Water Services

Executive Summary

Clean Water Services (CWS) implements a water quality credit trading program that includes flow enhancement and riparian planting activities. The thermal credits generated by these activities are used to offset the thermal load discharged from CWS' Rock Creek Water Resource Recovery Facility (WRRF), Durham WRRF, and Forest Grove WRRF including the Natural Treatment System (NTS).

In 2024, CWS released an average of 23.5 cubic feet per second (cfs) of stored water from Hagg Lake in July and 45 cfs of stored water from Hagg Lake in August. The Wapato instream lease provided 5.4 cfs in July and August. The stored releases and instream lease generated 873 million kilocalories (kcal) per day of thermal credit for July and 1,941 million kcal per day of thermal credit for August.

CWS also enrolled five riparian planting projects in 2024, enhancing over 3 stream miles and generating 27 million kcal per day of thermal credit. Since establishing the trading program in 2004, CWS has implemented 213 planting projects along streams in the Tualatin River Watershed that have generated over 640 million kcal/day of thermal credit.

The thermal credits generated from CWS' flow enhancement and riparian planting activities completely offset the thermal load discharged by the Rock Creek, Durham, and Forest Grove facilities. This annual report details CWS' flow enhancement and riparian planting activities during 2024 and provides an accounting of the thermal credits used to offset the thermal load discharged from the treatment plants.

The At a Glance graphic on the following page summarizes the benefits to date of CWS' water quality credit trading program for the Tualatin River Watershed.

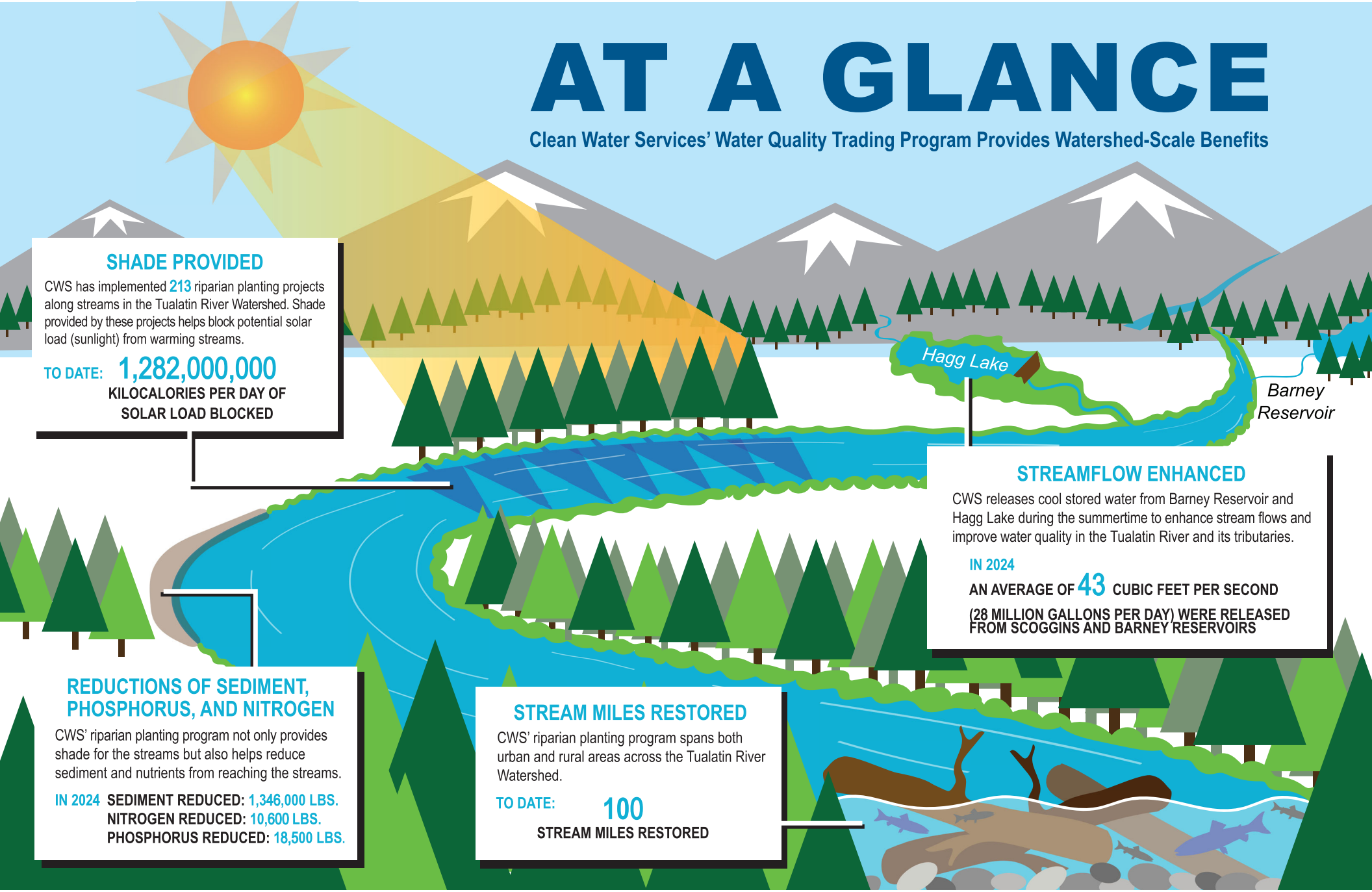
AT A GLANCE

Clean Water Services' Water Quality Trading Program Provides Watershed-Scale Benefits

SHADE PROVIDED

CWS has implemented **213** riparian planting projects along streams in the Tualatin River Watershed. Shade provided by these projects helps block potential solar load (sunlight) from warming streams.

TO DATE: **1,282,000,000**
KILOCALORIES PER DAY OF SOLAR LOAD BLOCKED



STREAMFLOW ENHANCED

CWS releases cool stored water from Barney Reservoir and Hagg Lake during the summertime to enhance stream flows and improve water quality in the Tualatin River and its tributaries.

IN 2024
AN AVERAGE OF **43** CUBIC FEET PER SECOND
(28 MILLION GALLONS PER DAY) WERE RELEASED FROM SCOGGINS AND BARNEY RESERVOIRS

REDUCTIONS OF SEDIMENT, PHOSPHORUS, AND NITROGEN

CWS' riparian planting program not only provides shade for the streams but also helps reduce sediment and nutrients from reaching the streams.

IN 2024 **SEDIMENT REDUCED:** 1,346,000 LBS.
NITROGEN REDUCED: 10,600 LBS.
PHOSPHORUS REDUCED: 18,500 LBS.

STREAM MILES RESTORED

CWS' riparian planting program spans both urban and rural areas across the Tualatin River Watershed.

TO DATE: **100**
STREAM MILES RESTORED

1. Background

CWS is a county service district that serves the urban portion of Washington County and small portions of Clackamas, Multnomah, and Yamhill counties. CWS owns and operates four WRRFs in the Tualatin River basin and works in partnership with its co-implementers — the 12 cities in the service area and Washington County. The WRRFs and the municipal separate storm sewer system (MS4) are permitted by the Oregon Department of Environmental Quality (DEQ) under CWS' watershed-based National Pollutant Discharge Elimination System (NPDES) permit. CWS' NPDES permit (Permit) was re-issued by DEQ on December 8, 2022, and became effective on January 1, 2023. This annual report covers CWS' activities under the water quality credit trading program from January 1 – December 31, 2024. This report satisfies the reporting requirements specified in the Permit.

The Permit includes thermal load limits for CWS' Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS based on the 2021 Temperature Total Maximum Daily Load for the Tualatin River. The Permit allows CWS to offset the thermal loads from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS by implementing a water quality credit trading program for temperature. The program includes flow enhancement and riparian planting as specified in Schedule D.13. of the Permit and CWS' DEQ-approved Thermal Load Management Plan (TLMP). The TLMP documents CWS' approach and programs for offsetting the thermal load from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS and specifies CWS' methodology for calculating the thermal credits associated with the riparian planting and flow enhancement programs. CWS updated its TLMP in July 2021; DEQ approved it with the 2022 Permit.

As required by Schedule D.13.f. of the Permit, CWS submitted information regarding thermal loads and credits in the July and August 2024 Discharge Monitoring Reports (DMRs) for the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS to demonstrate that CWS is offsetting thermal loads from its WRRFs. The July and August DMRs include the aggregate thermal load from the WRRFs, aggregate thermal credits from flow enhancement, aggregate thermal credits from riparian shade, aggregate total thermal credits, and the net thermal load to the Tualatin River.

Schedule D.13.g. of the Permit also requires CWS to submit a Water Quality Credit Trading Report annually by March 31 that summarizes the implementation and performance of the TLMP over the previous calendar year.

The Permit and TLMP require the annual report to include the following for each new riparian planting project that is enrolled within the calendar year:

- Project name and number.
- Stream length planted.
- Thermal load blocked.
- Thermal credits generated.

All this information is summarized in Section 5, Table 7.

The following information is also presented in this report. The section where the information appears in this report is noted.

- Thermal load reduction activities – recycled water use, treatment facility changes including use of the NTS, and source control activities (Section 2).
- Thermal loads discharged by the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS (Section 3, Table 4).
- Allowed thermal loads for the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS (Section 3, Table 4).
- Thermal load credits for flow enhancement (Section 3, Table 5).
- Thermal load credits for riparian shade (Section 5, Table 7).

For flow enhancement activities:

- The average daily effluent flow and maximum daily effluent temperature from the Rock Creek, Durham, and Forest Grove WRRFs for July 1 – August 31 (Appendix D).
- The average daily Tualatin River flow for July 1 – August 31 at Farmington Bridge (River Mile 33) and Golf Course Road (Appendix D).
- The average daily flow enhancement rate from Hagg Lake for July 1 – August 31 (Appendix D).

For riparian shade activities (at each site):

- Baseline vegetation conditions (density, width) (Appendix A).
- Enhanced vegetation conditions (type, width, anticipated density) (Appendix A).
- Stream characteristics (stream aspect, elevation, wetted width, near stream disturbance zone, incision) (Appendix A).
- Baseline thermal load blocked by existing vegetation and the anticipated thermal load blocked by the enhanced vegetation (Section 5, Table 7).
- Thermal credits from each riparian planting project (Section 5, Table 7, Appendices A and B).
- Riparian vegetation monitoring and maintenance activities (Section 2, Appendix A).
- Baseline compliance assessment (Section 2).
- Documentation of the use of public conservation funds (Section 2).

This report includes all the above information and fulfills the requirements for submitting an annual report of CWS' water quality trading activities for 2024.

2. 2024 Thermal Load Management Activities

The thermal load management activities presented in this report are from January 1 to December 31, 2024.

CWS implements a number of strategies to reduce the thermal load discharged from the WRRFs. The water quality credit trading program, which includes flow enhancement and riparian planting activities, is used to offset the remaining thermal load from the WRRFs.

2.1 2024 Thermal Load Reduction Activities

CWS' TLMP states that, on an annual basis, CWS will submit a report that specifies the actions taken to reduce the thermal load discharged from the WRRFs. CWS identified its recycled water program, the Forest Grove NTS, WRRF improvements, and source control activities as methods that could be used to reduce the thermal load discharged by the WRRFs. The following is a summary of the actions taken in each of these areas in 2024.

2.1.1 Recycled Water Program

CWS produced 72.1 million gallons of Class A recycled water at the Durham WRRF and 44.4 million gallons of Class A recycled water at the Rock Creek WRRF in 2024. This volume of recycled water represents a direct reduction in the thermal load discharged by CWS' WRRFs. Recycled water from the Durham WRRF is used at three golf courses, two public school athletic fields, a City of Tigard natural area, a CWS-owned natural area, a privately-owned farm, Durham City Park, and for onsite irrigation. Recycled water from the Rock Creek WRRF is used at the Reserve Golf Course.

2.1.2 Forest Grove Natural Treatment System

In 2017, CWS began discharging treated effluent from the Forest Grove and Hillsboro WRRFs through the 95-acre NTS in Forest Grove. Before implementing the NTS, the Forest Grove and Hillsboro WRRFs transferred wastewater through twin 24-inch pipelines to the Rock Creek WRRF for treatment and discharge during the dry season. Wastewater from the Forest Grove and Hillsboro service areas is now treated at the Forest Grove WRRF during the dry season; the treated effluent from the Forest Grove WRRF is then directed through the NTS for further treatment prior to discharge to the Tualatin River. CWS operated the NTS between June and November in 2024.

2.1.3 Improvements at Water Resource Recovery Facilities

CWS pursues capital improvements to further reduce thermal loads discharged from the Rock Creek, Durham, and Forest Grove WRRFs. In 2024, no significant changes were made at any of the facilities that would have reduced the thermal load. In previous years, CWS built a cogeneration facility at the Durham WRRF that included air-cooled radiators to dissipate excess heat to the atmosphere and avoid discharging excess heat to the treatment facility effluent. CWS also completed several projects at the Durham facility to expand the utilization of heat recovered from the operation of the cogeneration facility and displace the natural gas usage.

The hot weather the past few years has highlighted the need to further evaluate temperature profiles across the WRRFs. In 2021, CWS began a study of the temperature profiles across key unit processes at the Rock Creek and Durham WRRFs to evaluate opportunities to further reduce temperatures at the WRRFs. The study has been used to evaluate the effect of managing surface area by removing treatment units from service and shading secondary clarifiers. A shade pilot study was completed in 2023, and the results agree with model predictions that shading secondary clarifiers has the potential to reduce peak daily temperatures by approximately 0.2 degrees Celsius. CWS will continue to study temperature profiles, evaluate the results, and define actions, if any, to further reduce temperatures at the WRRFs.

2.1.4 Source Control

CWS regulates all significant industrial user discharges into the sanitary sewer system as part of its DEQ-approved industrial pretreatment program. In 2024, there were no significant changes in permitted industrial sources that would have resulted in substantive changes in the thermal load to the WRRFs. CWS continues to evaluate new and potential industrial thermal loads. Two significant industrial users continue to implement cooling systems at their facilities, which resulted in a substantial reduction in thermal load to the Rock Creek WRRF.

2.2 2024 Thermal Load Trading Activities

This section summarizes CWS' flow enhancement and riparian planting activities in 2024 as well as riparian monitoring and maintenance activities and shade monitoring activities. Additionally, this section describes CWS' programmatic evaluation of the riparian planting projects enrolled in the water quality trading program, including an assessment of baseline compliance and documentation of the use of public conservation funds for each project enrolled.

2.2.1 Flow Enhancement Activities

In 2024, CWS had 12,618 acre-feet of stored water available in Hagg Lake and 1,654 acre-feet in Barney Reservoir. CWS releases stored water during the summer and fall to meet the following objectives:

- Maintain minimum stream flows in the Tualatin River.
- Generate thermal credits to offset a portion of the thermal load from the CWS' WRRFs.
- Enhance tributary stream flows.
- Provide sustainable base flows in the upper Tualatin River.
- Improve dissolved oxygen levels and overall water quality in the Tualatin River.

Stored water releases in July and August form the basis of CWS' flow enhancement credit.

In 2024, CWS began releasing stored water from Hagg Lake on June 18 and continued until October 31. Stored water releases from Barney Reservoir began on July 29 and ended on September 24. Table 1 shows the average monthly release rates from Hagg Lake and Barney Reservoir for the 2024 release season.

CWS leases U.S. Fish & Wildlife Service natural flow water rights for instream use at Wapato Lake Wildlife Refuge as described in the 2020 Water Quality Credit Trading Annual Report. The water rights are relatively senior (1928) and located in the upper Tualatin River. They can be protected over the entire downstream length of the Tualatin River from May 1 to September 30. If natural flow water rights are regulated off, the water rights include access to supplemental water from the Tualatin Valley Irrigation District (TVID). Thermal credits are available from the instream lease as long as CWS maintains an agreement with the U.S. Fish & Wildlife Service and TVID for the instream lease. The credits are calculated for July and August as defined by CWS' Permit and TLMP. Temperature benefits and thermal credits associated with the instream lease at the Forest Grove, Rock Creek, and Durham facilities are calculated using the formulae in the TLMP.

CWS worked with the Oregon Water Resources Department District 18 Watermaster's office to protect the instream lease rate of 5.4 cfs and have it included as part of the baseflow for the Tualatin River. From May 1 until the end date of the lease on September 30, the instream lease was based on natural flow in the Tualatin River. Table 1 shows the average instream rate of the Wapato instream lease for the 2024 release season.

Table 1: 2024 Average Monthly Release Rates from Hagg Lake and Barney Reservoir and the Wapato Instream Lease

Month	2024 Average Release Rate from Scoggins Reservoir (cfs)	2024 Average Release Rate from Barney Reservoir (cfs)	2024 Average Rate from Wapato Instream Lease (cfs)	2024 Average Combined Stored Water Release Rate + Instream Lease (cfs)
May	-	-	5.4	5.4
June	10.0*	-	5.4	15.4
July	23.5	14.0*	5.4	30.3
August	45.0	14.0	5.4	64.4
September**	50.0	14.0*	5.4	50.0
October**	42.3	-	-	42.3
November	-	-	-	-

* Average based on days stored water was released.

** Stored water releases from Hagg Lake and Barney Reservoir ended on October 31 and September 24, respectively.

CWS also works with landowners to lease their natural flow water rights for instream use. To date, CWS has leased 26 water rights on the mainstem Tualatin River or tributaries, totaling nearly 553 acre-feet, for instream use. CWS has not yet used this water to generate credits as part of its water quality credit trading program.

In 2024, CWS used approximately 10,029 acre-feet (approximately 80%) and 1,611 acre-feet (approximately 97%) from Hagg Lake and Barney Reservoir, respectively.

2.2.2 Riparian Planting Activities

This section lists the riparian planting projects enrolled in the water quality trading program in 2024, describes the project summary created for each project, and describes CWS' Capital and Landowner Incentive programs.

For 2024, CWS enrolled five projects that total approximately 3.08 stream miles in the Tualatin River basin for thermal credit. Table 2 presents the riparian planting projects and the stream length associated with each project.

Table 2: 2024 Riparian Planting Projects

Project	Stream Name	Stream Length (ft)
2470 – Metro – Baker Heaton Extension	Baker Creek	2,600
2537 – TSWCD – Bledsoe Creek	Bledsoe Creek	2,088
2540 – TSWCD – East Fork Dairy Creek	East Fork Dairy Creek	2,300
2565 – Fanno Creek – Durham WRRF	Fanno Creek	379
2584 – Wapato TRNWR – East Side Levee	Hill Creek	8,900
Total Stream Miles		**3.08 miles**

TSWCD: Tualatin Soil and Water Conservation District
TRNWR: Tualatin River National Wildlife Refuge

2.2.2.1 Project Summaries

Appendix A contains a project summary for each project credited in 2024. Project summaries contain general site information (site location, number of acres, location description, stream length and average width, plant communities, partners involved, project activities, etc.), a site assessment report, a summary of the thermal credits generated, and the input and output data used to calculate the effective shade and thermal load blocked for each project.

2.2.2.2 Capital Program

Riparian planting projects implemented under CWS' Capital Program mostly occur on public lands where large-scale restoration opportunities are available and multiple water quality and ecological benefits can be achieved. Project activities under this program include securing easements or stewardship agreements with property owners, site preparation activities, managing invasive species, revegetation, monitoring, and maintenance. Additional enhancement activities such as reconfiguring channels; placing large wood, gravel, and boulders; and creating off-channel habitats are performed on a site-specific basis to improve a broader range of ecosystem functions. Three riparian enhancement projects, a total of 2.25 stream miles, were planted under CWS' Capital Program in 2024.

2.2.2.3 Landowner Incentive Program

CWS contracts with the Tualatin Soil and Water Conservation District (TSWCD) to provide incentives for enrolling landowners in an enhanced version of the U.S. Department of Agriculture's Conservation Reserve Enhancement Program (ECREP) and Vegetated Buffer Areas for Conservation (VEGBAC) program. The ECREP provides an opportunity to leverage local and federal programs. This collaboration has greatly increased the acceptance and implementation of restoration programs at the local level. Riparian planting projects in rural areas primarily consist of site preparation, revegetation, managing invasive species, monitoring, and maintenance. In 2024, two riparian enhancement projects were undertaken under the CWS' Landowner Incentive Program resulting in 0.83 stream miles of riparian planting.

2.2.2.4 Riparian Monitoring and Maintenance Activities

Site monitoring and maintenance are critical to ensure the success of riparian planting projects because revegetated sites need protection from a variety of stressors including invasive species, herbivores, and dry weather. As a result, CWS implements a robust monitoring and maintenance program that includes qualitative and quantitative monitoring activities. The following sections outline CWS' approach toward monitoring and maintenance. The results of the activities at each project site are presented in site assessment reports. The reports for projects enrolled in 2024 are presented in Appendix A and the reports for projects enrolled between 2004 and 2023 are available upon request.

2.2.2.5 Qualitative and Quantitative Monitoring

CWS conducts qualitative and quantitative monitoring during the summer at the riparian planting projects enrolled for thermal credit. Crews document site conditions and site-specific management actions in site assessment reports.

Qualitative monitoring is conducted annually to assess overall project health and inform management actions. This assessment approach not only helps project managers determine the necessary level of maintenance needed at each riparian planting project site (e.g., inter-planting, seeding, weed control, herbivore protections) but also accounts for the dynamic nature of riparian planting projects as they mature from initial plantings to stable riparian ecosystems.

Quantitative monitoring is conducted every two years and includes information regarding native tree and shrub counts, species composition, species diversity, density, and riparian structure. Project phase (i.e., transitional, established, or stewardship phase) is derived from these metrics for each plant community and informs management actions.

2.2.2.6 Site Assessment Reports

CWS prepares an assessment report for each project site and uses the report to document site conditions, identify management actions taken, and propose actions for the following year. Each site assessment report contains project-specific information including project acreage, the initial planting year, the year when thermal credit was taken, and the stream length associated with the project. Site assessment reports also contain information regarding each plant community (e.g., riparian forest, forested wetland, upland forest, scrub-shrub) within a project. This information includes a list of categorized plant

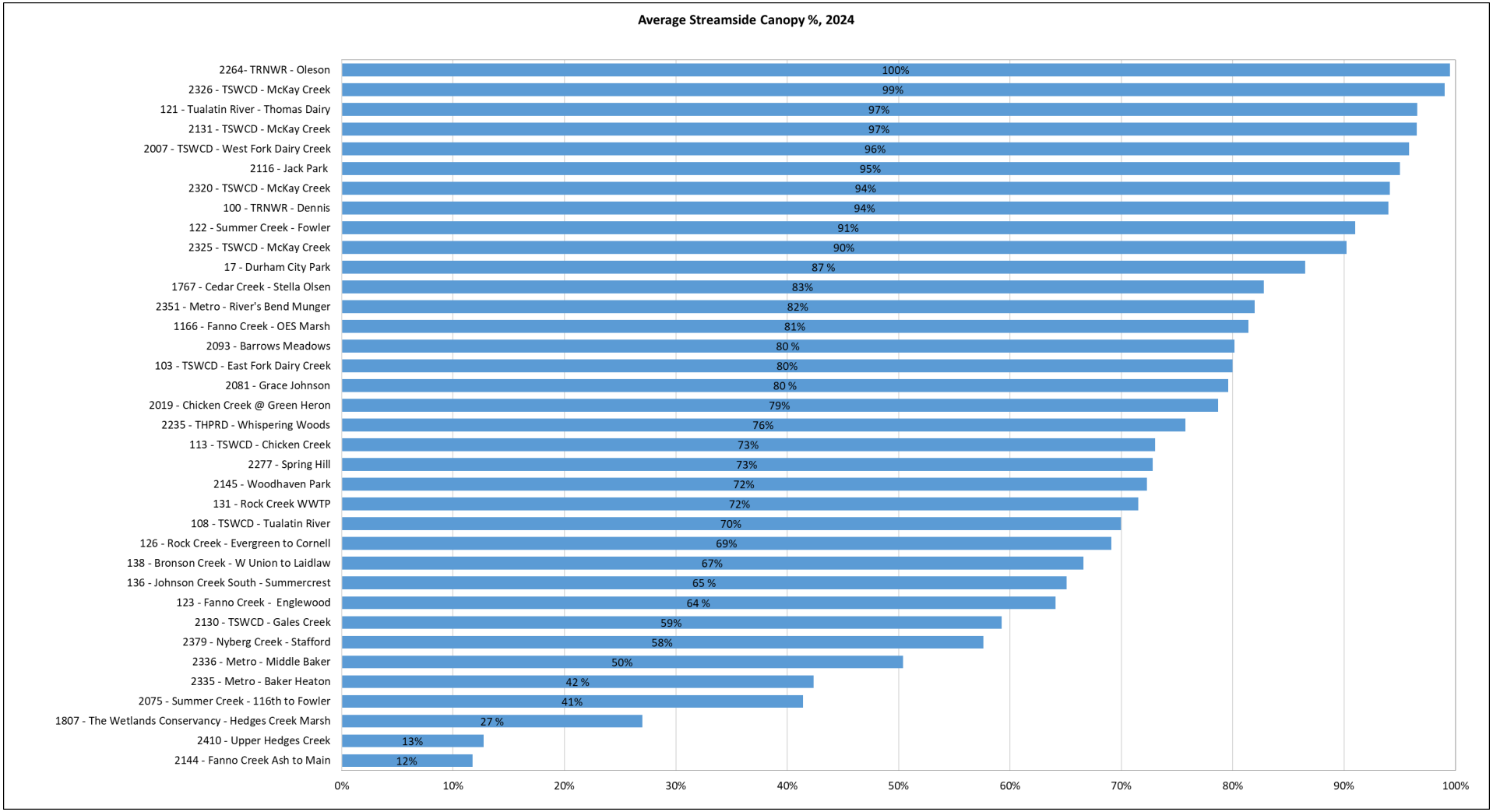
species, stem densities, and the phase of each plant community. As described in the site assessment reports, the five projects credited in 2024 range from 1.85 to over 66 acres. Most of the projects were planted with a riparian forest-type plant community; other plant communities included scrub-shrub and emergent marsh. Management actions completed in 2024, and additional management actions recommended for 2025 at these sites include inter-planting, seeding, and invasive weed treatment.

2.2.3 Shade Monitoring

CWS monitors each project site to assess plant diversity and density, overall project health, and project phase. In addition, CWS collects data to assess shade at riparian projects every five years. An accurate representation of streamside canopy cover is difficult to obtain due to the challenges associated with field shade monitoring protocols. CWS conducts shade monitoring using field measurements and remotely sensed datasets, including Light Detection and Ranging (LiDAR) and aerial photos. The shade monitoring protocol for the field measurements calls for establishing one monitoring point for each 500-foot stream segment of a project with a minimum of three monitoring points per project. Photographs and densiometer readings are taken at each monitoring point. Photographic monitoring includes upstream and downstream views of each stream bank within the project. Shade is estimated as densiometer readings of canopy cover on each stream bank within the project.

This year marks the 20th anniversary of CWS' water quality credit trading program. Figure 1 presents the shade monitoring results at the 36 sites enrolled in the program in 2004, 2009, 2014, and 2019 that were monitored for shade in 2024.

Figure 1: 2024 Shade Monitoring Results



*Some project names have changed since their enrollment in the trading program to better reflect their location in the watershed. The project numbers have not changed.

Thirty-one of the 36 projects provided 50% or greater streamside canopy cover; the remaining five provided less than 50%.

The 2144-Fanno Creek Ash to Main, 2410-Upper Hedges Creek, and 1807-The Wetlands Conservancy-Hedges Creek Marsh projects had an average streamside canopy cover of less than 40% when monitored for shade in 2024. The projects have been enrolled in the trading program for five years and significant canopy cover was not expected. CWS will continue to monitor these sites for invasive species cover, plant diversity, and density and increase management actions if the projects are not performing as expected when monitored 10 years after project enrollment.

Nine of the 36 sites have been enrolled in the program for 20 years and were monitored for shade in 2004, five were monitored for shade in 2009, four were monitored for shade in 2014, and 18 were monitored for shade in 2019. Except for the sites mentioned above, the projects are achieving performance goals. Minor variations in shade estimates at project sites are likely due to challenges associated with the precision of field shade monitoring protocols; more significant changes in shade are likely a result of natural processes that alter stream and riparian characteristics.

As reported in the 2023 annual report, four projects (110-TSWCD-Chicken Creek Tributary, 112-TSWCD-Tualatin River, 1522-TSWCD-Abbey Creek, and 1524-TSWCD-Rock Creek) that were enrolled in the program in 2007; one project enrolled in 2008 (1927-TSWCD-Cedar Creek); and one project enrolled in 2013 (2140-Gales Creek) were not monitored for canopy cover using field densiometers as an estimate of shade in 2023 because there was no landowner contract in place during that time; these projects were monitored for shade using LiDAR and aerial imagery in 2024. Streamside canopy cover at these four projects was over 40% when monitored with LiDAR in 2019 and a LiDAR flight was conducted in 2024. Results of the LiDAR monitoring will be available in 2025.

In 2024, one project (107-TSWCD-Tualatin River Tributary) was not monitored for canopy cover using field densiometers as an estimate of shade because there is no landowner contract currently in place for this project. CWS anticipates obtaining LiDAR data in 2025 that was captured during summer 2024 and will use the data to assess canopy cover for the project. Streamside canopy cover for this project when last monitored using field densiometers was 87% in 2019.

CWS is committed to ensuring the success of each of its planting projects. Crews monitor each project site extensively and evaluate plant diversity and density, overall project health, and project phase. Should a project not perform as expected, CWS implements management actions to ensure the project's success. Out of the 213 riparian planting projects enrolled in CWS' water quality trading program, six required additional management actions to improve project performance. Appendix C describes the challenges encountered and the additional management actions taken at each project site.

Monitoring and management follow-up efforts have improved project conditions and overall performance. For example, Project 108-TSWCD-Tualatin River and Project

2093-Barrow Meadows were not performing as expected and were previously reported in Appendix C. However, CWS implemented additional management actions including invasive weed treatment and several inter-planting events at these sites. Over the years, more than 72,000 and 19,000 plants were planted adjacent to the streams at Projects 108 and 2093, respectively. These additional management actions resulted in an increase in streamside canopy cover from 5% in 2007 to nearly 70% in 2024 at Project 108-TSWCD-Tualatin River and from less than 1% in 2012 to approximately 80% at Project 2093-Barrow Meadows in 2024. These projects have been removed from Appendix C.

2.2.4 Programmatic Assessment of Enrolled Riparian Planting Projects

This section describes the programmatic assessments conducted for riparian planting projects enrolled in the water quality trading program in 2024. These include a baseline compliance assessment and an evaluation of the use of public conservation funds.

2.2.4.1 Baseline Compliance Assessment

In accordance with Schedule D.13.c.ii. of the Permit, CWS conducts a baseline compliance assessment for each riparian planting project enrolled in the trading program. CWS identifies the regulatory requirements regarding riparian areas that apply at each site and verifies the project is in compliance. CWS then determines the conditions that should be used to determine a baseline for calculating thermal credit.

For riparian planting projects in agricultural areas, local water quality management rules (Oregon Administrative Rules (OAR) Chapter 603, Division 95) developed by the Oregon Department of Agriculture (ODA) were identified as the regulatory requirements that apply. These rules include non-disturbance criteria for streamside riparian areas. The TSWCD, with the support of local partners, implements the Agricultural Water Quality Management Plan as a local management agency for the ODA. Only projects that are in compliance with applicable rules are enrolled into the program, and the TSWCD verifies compliance. For sites deemed to be in compliance, existing vegetation is used to define baseline conditions for determining thermal credit. The four riparian planting projects located in agricultural areas in 2024 (2470-Metro-Baker Heaton Extension, 2537-TSWCD-Bledsoe Creek, and 2540-TSWCD-East Fork Dairy Creek) were in compliance with the ODA's local water quality management rules. Thus, existing conditions were used as a baseline to determine thermal credit.

For riparian planting projects in urban areas, CWS' Design and Construction Standards (D&C Standards) (adopted in 2019 by CWS Resolution and Order 19-5 and amended by CWS Resolution and Order 19-22) apply to all active construction sites and to all construction project sites undertaken since the mid-1990s. In 2024, CWS did not enroll any projects for thermal credit in urban areas governed by the D&C Standards.

The cities within CWS' service area and Washington County also have regulations regarding riparian protection in urban natural resource areas. One project was implemented that was located within a city jurisdiction in 2024. The 2565-Fanno Creek-Durham WRRF project is in Tigard. The city's regulations regarding riparian protection are voluntary and do not require active riparian planting (City of Tigard Community

Development Code, Chapter 18.510.020). Therefore, existing conditions were used as a baseline to determine thermal credits for the project.

Project 2584-Wapato TRNWR-East Side Levee is located outside an urban area, but not where agricultural activities occur. As a result, neither the ODA's local water quality management rules nor CWS' D&C Standards apply. However, these projects are in Washington County, where regulations regarding riparian protection are voluntary and do not require active riparian planting (Washington County Development Code Section 422-1). Therefore, existing conditions were used as a baseline for determining thermal credits.

2.2.4.2 Public Conservation Funds

CWS' TLMP includes a requirement to document the use of public conservation funds (PCFs) for each project in the trading program. PCFs are defined in OAR 340-039-0005(4) as "[p]ublic funds that are targeted to support voluntary natural resource protection or restoration." OAR 340-039-0040(4) states that "[c]redits generated under an approved trading plan may not include water quality benefits obtained with public conservation funds. Where public sources of funding are used for credit-generating activities, it is the entity's responsibility to demonstrate compliance with this requirement in its annual report." Based on the definition of water quality benefits in DEQ's Water Quality Trading Internal Management Directive, credit-generating activities include site preparation, planting, monitoring, and maintenance activities.

CWS works with several partner agencies to implement riparian planting projects. For projects where PCFs are used, CWS uses the approaches described in Section 3 below to demonstrate that the thermal credits being claimed are based on CWS' contribution toward credit-generating activities (e.g., site preparation, planting, monitoring, and maintenance activities).

For projects conducted through the VEGBAC and ECREP programs, PCFs are not used. CWS funds the cost of all credit-generating activities and thus, is eligible for 100% of the thermal credits generated by these projects.

As part of the Capital Program, CWS partners with the co-implementers, Metro, Tualatin Hills Park & Recreation District (THPRD), and other agencies to implement riparian planting projects. For Metro and THPRD projects, CWS has intergovernmental agreements that identify the work performed by each entity at a project site. CWS conducts the credit-generating activities, thus, 100% of the thermal credits generated are available for CWS' use. For projects where CWS partners with the co-implementers or other agencies such as the U.S. Fish & Wildlife Service, PCFs are not used. CWS funds the cost of all credit-generating activities and is, therefore, eligible for 100% of the thermal credits generated by these projects.

PCFs were not used at any of the riparian projects enrolled in 2024.

3. Calculation of Thermal Loads and Credits for 2024

Schedule B.4.f. of the Permit requires CWS to report the aggregate thermal load to offset and the aggregate thermal credits for the Durham WRRF, Rock Creek WRRF, and Forest Grove WRRF and NTS. As referenced in Table 3 (which is Table B9 in Schedule B.4.f. of the Permit), the "aggregate thermal load to offset" is the combined "excess thermal load to offset" from the Durham WRRF, Rock Creek WRRF, and the Forest Grove WRRF and NTS. The aggregate thermal credit is the combined credits from riparian shade plantings and flow enhancement. The "aggregate thermal load to offset" is the aggregate of the excess thermal load minus the allowable thermal load at each WRRF.

Table 3: Aggregate Thermal Load to Offset and Aggregate Thermal Credits Generated

Item or Parameter	Units	Time Period	Minimum Frequency	Sample Type / Required Action	Report Statistic (See note a.)
Aggregate Thermal Load to Offset	Million kcals/day	July 1 – August 31	1/month	Calculation (See note b.)	Monthly Maximum
Aggregate Thermal Load Credit	Million kcals/day	July 1-August 31	1/month	Calculation (See note c.)	Monthly Maximum

Note:

a. When submitting DMRs electronically, all data used to determine summary statistics must be submitted in a DEQ-approved format as a spreadsheet via electronic reporting unless otherwise directed by DEQ.

b. The aggregate thermal load to offset is the combined thermal load to offset from the Durham and Rock Creek WRRFs and the Forest Grove NTS.

c. The aggregate thermal credit is the combined credits from riparian shade plantings and flow enhancement.

The section below presents the aggregate thermal load to offset and the aggregate thermal load credits for the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS for 2024.

3.1 Aggregate Thermal Load to Offset

The excess thermal loads discharged from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS are based on daily maximum effluent temperature and daily average effluent flow conditions for each WRRF for July and August. The period July 1 to August 31 is identified in the Permit as the temperature credit trading period and corresponds to the time of year when river temperatures are of most concern.

The excess thermal loads discharged from each WRRF are calculated daily for July and August using the equation from Schedule A.2 in the Permit:a

$$Excess\ Thermal\ Load\ \left(million\frac{kcal}{day}\right) = Q_{PS} \times \Delta T \times \left(\frac{1000}{35.3}\right) x\ 86400\ x\ 5/9$$

where: $\Delta T = T_{PS}\text{-}T_{SP}$ *(degrees F)*

Q_{PS} = *treatment plant effluent flow (cfs)*

T_{PS} = *treatment plant maximum daily effluent temperature (degrees F)*

T_{SP}=*system potential temperature (degrees F)*

(Durham WRRF = 64.6 degrees F, Rock Creek WRRF=58.5 degrees F, Forest Grove WRRF and NTS = 53.1 degrees F)

Other factors: 1000 kg/m^3; 35.3 ft^3/m^3; 86,400 sec/day; (5 degrees C)/(9 degrees F)

The daily average effluent flow and daily maximum effluent temperatures that are used to calculate the excess thermal loads for each WRRF for July and August are presented in Appendix D.

The allowable thermal load, which represents the permitted thermal load, is also calculated for each WRRF for July and August. The aggregate thermal load to offset for the WRRFs is calculated as shown in the following equation:

$$Aggregate\ Thermal\ Load\ to\ Offset = Aggregate\ Excess\ Thermal\ Load - Aggregate\ Allowable\ Thermal\ Load$$

In 2024, the aggregate thermal load to offset from the WRRFs was 1,229 million kcal/day for July and 1,254 million kcal/day for August. The aggregate excess thermal loads, aggregate allowable thermal loads, and aggregate thermal loads to offset the WRRFs for July and August 2024 are presented in Table 4.

Table 4: Aggregate Thermal Load Summary for July and August 2024

Data Aggregate Summary for Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS	
July 2024	
Aggregate excess thermal load	1,291 million kcal/day
Aggregate allowable thermal load	62 million kcal/day
Aggregate thermal load to offset	1,229 million kcal/day
August 2024	
Aggregate excess thermal load	1,317 million kcal/day
Aggregate allowable thermal load	63 million kcal/day
Aggregate thermal load to offset	1,254 million kcal/day

3.2 Aggregate Thermal Load Credits Generated

This section presents the aggregate thermal load credits generated from flow enhancement and riparian planting for the Durham WRRF, Rock Creek WRRF, and Forest Grove WRRF and NTS for July and August 2024.

3.2.1 Flow Enhancement Credits

Table 5 presents the median flow at the Farmington gauge and the average flow enhancement rate for July and August 2024. Flow enhancement credits are calculated using empirical equations that quantify the temperature benefits of CWS' stored water releases at each facility. The aggregate thermal credits from flow enhancement were 873 million kcal/day for July 2024 and 1,941 million kcal/day for August 2024. Thermal credits from flow enhancement in July and August are based on CWS' stored water releases from Hagg Lake, Barney Reservoir, and the Wapato instream lease.

Table 5: Flow Enhancement Information and Aggregate Thermal Credits from Flow Enhancement (July and August 2024)

Flow Enhancement Summary	
July 2024	**Flow rate / credits**
Median Farmington flow	194 cfs
Average flow enhancement rate	30.3 cfs
Aggregate thermal credits from flow enhancement	873 million kcal/day
August 2024	**Flow rate / credits**
Median Farmington flow	196 cfs
Average flow enhancement rate	64.4 cfs
Aggregate thermal credits from flow enhancement	1,941 million kcal/day

4. Reconciliation of Thermal Loads and Credits for 2024

Table B1 and Table B9 from Schedule B.4.f. of the Permit require CWS to report the aggregate thermal load to offset and the aggregate thermal credits for the Durham WRRF, Rock Creek WRRF, and Forest Grove WRRF and NTS as part of the July and August DMRs submitted to DEQ. Note that the July and August 2024 DMRs were updated due to a minor error in the credit calculations and will be resubmitted to DEQ. The numbers presented in Table 6 were reported in the July 2024 and August 2024 DMR to show:

- The aggregate excess thermal load.
- The aggregate allowable thermal load.
- The aggregate thermal load to offset from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS.
- The aggregate thermal credits generated with flow enhancement.
- The 618 million kcal/day of aggregate thermal credits generated with riparian plantings for 2004 – 2023.
- The total aggregate thermal load credit.
- The net thermal load to the Tualatin River.

Table 6: Aggregate Thermal Loads and Credits Summary (July and August 2024)

Thermal Loads and Credits: July and August 2024 (in million kcal/day*)								
	Aggregate Excess Thermal Load	Aggregate Allowable Thermal Load	Aggregate Thermal Load to Offset	Aggregate Thermal Credits from Flow Augmentation	Aggregate Thermal Credits from Riparian Shade		Aggregate Thermal Load Credit	Net Thermal Load (to Tualatin River)
					Generated Before Reporting Period	Generated During Reporting Period		
Jul	1,291	62	1,229	873	618	0	1,491	0
Aug	1,317	63	1,254	1,941	618	0	2,559	0

* Thermal loads and credits are reported in the July and August DMRs only

** In accordance with Schedule A.2, compliance with the thermal load limits is demonstrated by generating thermal credits that meet or exceed the Aggregate Thermal Load to Offset discharged from the Durham, Rock Creek, and Forest Grove water resource recovery facilities. The term "Net Thermal Load to Tualatin River" is the "Aggregate Thermal Load to Offset" minus the "Aggregate Thermal Load Credit." Compliance with the thermal load limits is achieved if the "Net Thermal Load to Tualatin River" is zero.

This table shows that CWS continues to offset the excess thermal loads from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS using credits generated from flow enhancement and riparian shade planting activities as demonstrated by a zero net thermal load to the Tualatin River.

CWS generated significantly more thermal credits with its water quality trading program than needed to offset thermal loads from the WRRFs. In 2024, CWS generated 262 million kcal/day and 1,305 million kcal/day of extra thermal credits in July and August,

respectively. Note that the river flow data used to calculate the thermal loads and credits for the July and August DMRs is raw data and subject to change.

5. Riparian Planting Credits Available for 2025

As specified in Schedule D.13.g. of the Permit, this report must include, at a minimum, the project name, project number, stream length planted, thermal load blocked, and thermal credits generated for each new riparian shade project completed within the calendar year.

Table 7 presents this information for the riparian planting projects credited in 2024. The table shows the stream miles planted, the thermal load blocked by existing vegetation conditions (baseline), the thermal load blocked by future enhanced vegetation conditions (modeled using a 20-year shade establishment period), and the overall thermal load reduction. Using riparian vegetation codes (Appendix E) and stream characteristic information as inputs, the "Shade-a-Lator" component of DEQ's Heat Source temperature model (version 6.0) was used to calculate effective shade and thermal load blocked with baseline riparian vegetation conditions, and effective shade and thermal load blocked for the future enhanced vegetation conditions. The difference between the thermal load blocked with enhanced conditions and the thermal load blocked with baseline conditions represents the reduction in thermal load (i.e., environmental benefit) associated with the riparian planting project. CWS' TLMP specifies a 2-to-1 trading ratio for calculating credit for shade (i.e., the thermal credit for shade is equal to 50% of the environmental benefit).

For 2024, CWS generated approximately 27 million kcal/day of thermal credit from riparian planting projects.

Table 7: 2024 Riparian Planting Projects and Associated Thermal Credit

Project	CWS Program	Stream Length (feet)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) [a] (million kcal/day)	Thermal Credits Available [b] (million kcal/day)	CWS Thermal Credits [c] (million kcal/day)
2470 - Metro - Baker Heaton Extension	Capital	2,600	7.95	10.71	2.77	1.38	1.38
2537 - TSWCD - Bledsoe Creek	VEGBAC	2,088	1.56	1.81	0.26	0.13	0.13
2540 - TSWCD - East Fork Dairy Creek	VEGBAC	2,300	7.92	20.30	12.38	6.19	6.19
2565 - Fanno Creek - Durham WRRF	Capital	379	2.10	2.16	0.051	0.025	0.025
2584 - Wapato TRNWR - East Side Levee	Capital	8,900	5.98	45.02	39.05	19.52	19.52

a) The “Thermal Load Reduction” represents the thermal load blocked by enhanced conditions minus the thermal load blocked by baseline conditions.

b) Using CWS' 2-to-1 trading ratio, the “Thermal Credits Available” represent 50% of the “Thermal Load Reduction.” Note there are minor differences in the calculation of thermal credits due to rounding associated with the application of the trading ratio.

c) “CWS Thermal Credits” represents the thermal credit claimed by CWS based on its contribution to credit-generating activities. Public conservation funds were not used at any of the riparian projects enrolled in 2024, so CWS is eligible for 100% of the thermal credits generated by these projects.

As of 2024, CWS has 213 riparian shade projects enrolled in the water quality trading program, which has resulted in over 640 million kcal/day of riparian shade credit and the restoration of approximately 100 stream miles of riparian vegetation. Appendix B has a summary of the riparian shade projects including project name, credit year, project characteristics (average wetted width and stream length), and the thermal credit claimed by CWS. CWS takes thermal credits for those projects for which a valid contract or agreement is in place. For projects that do not have a landowner contract in place, CWS conducts routine shade monitoring using LiDAR and aerial imagery and takes thermal credits if they provide the expected canopy cover. All projects identified in Appendix B, Table B, as being "active" are enrolled in CWS' water quality trading program.

Five projects were removed from the water quality trading calculation portfolio in 2019 because the landowners opted not to renew their contracts or agreements. In 2023, CWS added these projects to its calculation portfolio and conducts routine shade monitoring using LiDAR and aerial imagery. CWS reviewed the 2019 LiDAR and aerial imagery data for these projects to ensure they were continuing to function as intended before re-enrolling them into the water quality trading shade portfolio. Should the projects provide less than the anticipated shade and require onsite work, and a landowner agreement or contract is not in place, the project will be removed from the program until a landowner contract or agreement is renewed.

In 2024, CWS voluntarily removed one of the five projects, Project 1910-TSWCD-Tualatin River, from its portfolio of riparian shade projects because it no longer provided the anticipated shade and requires onsite work, and a landowner agreement or contract is not in place. The 640 million kcal/day of riparian shade credit reflects the removal of this project and its associated credits from CWS' portfolio. If the landowner contract or agreement is renewed in the future, the project will be added back into CWS' portfolio of riparian shade projects. CWS will review the project to ensure it is continuing to function as intended before re-enrolling it into CWS' water quality credit trading program.

CWS' 640 million kcal/day of riparian shade credit includes the addition of the approximately 27 million kcal/day of riparian shade credits that were generated by the five riparian shade projects enrolled in the program in 2024. The 640 million kcal/day of riparian shade credit will be available for use in 2025 and will be reported in the July and August 2025 DMRs for the Rock Creek, Durham, and Forest Grove WRRFs.

6. Adaptive Management

In its February 6, 2019, policy memorandum on water quality trading, the Environmental Protection Agency noted that adaptive management is a key principle of a water quality trading program. CWS implements an adaptive management program to assess effectiveness and to improve its water quality trading program. Project-specific adaptive management strategies are discussed in the Shade Monitoring section above. Additionally, CWS reviews its TLMP to ensure it reflects current implementation strategies; any updates to the TLMP are included in the annual report. There were no other adaptive management changes implemented in 2024.

An updated TLMP was submitted to DEQ as an addendum to the Permit renewal application in July 2021. The updated plan incorporated the adaptive management changes to the TLMP that CWS had made during the 2016 Permit cycle. The updated TLMP was approved by DEQ when it reissued the Permit in December 2022.

7. Environmental Benefits

CWS' water quality credit trading program provides numerous benefits beyond temperature benefits. Ecosystem benefits include improved stream functions (e.g., floodplain roughness, bank stabilization, peak flow attenuation, habitat creation), increased diversity of aquatic and terrestrial plant and animal species, filtering of stormwater runoff, and improved water quality. The increased complexity of structure and diversity of restored riparian forests, forested wetlands, and scrub-shrub wetlands support many important ecosystem functions for the aquatic environment. One example is the colonization of some stream reaches by beavers, a keystone species for stream function in the watershed. By raising the water table, beavers promote floodplain wetlands with enhanced plant, animal, and geomorphic diversity in comparison to the original simplified stream channel. These features, and the resulting geomorphic complexity, enhance fish habitat quality and create off-channel habitats that may provide cold water refuges. CWS works with multiple partners to enhance riparian areas, which improves the overall health of the Tualatin River Watershed and improves water quality.

CWS has quantified the water quality benefits associated with sediment and nutrient reduction from the riparian planting program. The 213 riparian planting projects enrolled in CWS' water quality trading program are estimated to remove approximately 1,346,000 pounds of sediment, 10,600 pounds of total nitrogen, and 18,500 pounds of phosphorus each year that would otherwise be released to streams in the Tualatin Basin. These estimated load reductions are based on a 2014 study on nutrient and sediment removal rates for stream restoration projects in the Chesapeake Bay[1]. The Chesapeake Bay study provides a wide range of sediment and nutrient removal reduction for stream restoration projects.

CWS' release of stored water flow enhancement provides cooling effects, buffers against temperature changes, and results in higher dissolved oxygen levels and improved overall water quality to support aquatic life. CWS' releases of stored water also sustain base flows in the upper Tualatin River that otherwise would not exist. The release of stored water and the release of highly treated discharges from CWS' Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS provide a sustainable base flow to the mainstem Tualatin River during the dry season.

[1] Schueler, T., Stack, B. 2013. Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects. Chesapeake Stormwater Network and Center for Watershed Protection, Ellicott City, MD. Pages 1-131 available at: http://www.chesapeakebay.net/documents/Final_CBP_Approved_Stream_Restoration_Panel_report_LONG_with_appendices_A-G_02062014.pdf

8. Appendices

Appendix A: Project Summaries for Riparian Planting Projects Credited in 2024

Appendix B: Riparian Shade Planting Projects (2004-2024)

Appendix C: Additional Management Actions

Appendix D: Identification of Trading Baselines for Flow Enhancement

Appendix E: Riparian Codes for Shade-a-Lator

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Appendix A

Project Summaries for Riparian Planting Projects Credited in 2024

2470 - Metro – Baker Heaton Extension

Project Summary

Project ID	Acres
2470	8.18
Location	
Public rural property in Washington County, bisected by a tributary to Baker Creek, located east of Southwest Seiffert Road.	
Program	
Capital	
Lat/Long	**Number of Plants Installed**
45.38, -122.92	41,836
Stream Length	**Average Stream Width**
2,600 feet	13.5 feet
Initial Planting Year/Credit Year	**CWS Thermal Benefits/Credits**
2022/2023	1.38 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
Metro	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2470	Project Name: Metro - Baker Heaton Extension		
Project Acres: 8.18	Initial Planting Year: 2022	Initial Credit Year: 2024	Length of Stream: 2,600 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 3,310 — Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
*bigleaf maple	baldhip rose	American speedwell	common velvetgrass
cascara	*beaked hazelnut	bracken fern	herb Robert
*Douglas-fir	elderberry	cleavers	Himalayan blackberry
Pacific dogwood	low Oregon grape	Columbia brome	Scotch broom
*red alder	osoberry, indian plum	common sweet cicely	
*vine maple	Pacific poison oak	enchanter's nightshade	
	red huckleberry	false lily of the valley	
	*salal	fragrant bedstraw	
	snowberry	*fringecup	
	thimbleberry	giant horsetail	
	*trailing blackberry	*lady fern	
		Mexican hedgenettle	
		Pacific trillium	
		Pacific waterleaf	
		piggyback	
		skunk cabbage	
		small-fruited bulrush	
		spike bentgrass	
		starry false lily of the valley	
		stinging nettle	
		tall mannagrass	
		taperfruit shortscale sedge	
		*water parsely	
		western starflower	
		*western swordfern	
		wild ginger	
		willowherb	

Management Actions

Completed: 2024	Recommended: 2025
☐ Interplant	☐ Interplant
☐ Invasive weed treatment	☐ Invasive weed treatment
☑ Seeding	☐ Seeding
☐ Herbivore Control	☐ Herbivore Control
☐ Other	☐ Other
☑ Monitoring for Adaptive Management	☑ Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2470 - Metro-Baker Heaton Extension	Capital	2,600	7.95	10.71	2.77	1.38	1.38

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2470 - Metro - Baker Heaton Extension	59.6%	2.3E+05	100	332	8.2	45.2	0.7	1150	1150	1175	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	38.7%	1.5E+05	99	326	8.2	45.2	0.7	1125	1150	1175	1175	1175	1175	1000	1000	1000	1125	1125	1125	1125	1150	1150	1150	1150	1150
2470 - Metro - Baker Heaton Extension	66.6%	2.6E+05	100	296	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1150	1175	1175
2470 - Metro - Baker Heaton Extension	61.7%	2.4E+05	100	331	8.2	45.2	0.7	1150	1175	1175	1175	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1175	1175	1125	1000
2470 - Metro - Baker Heaton Extension	66.4%	2.6E+05	100	295	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1150	1150	1150	1125	1125
2470 - Metro - Baker Heaton Extension	47.4%	1.9E+05	100	293	8.2	45.2	0.7	1150	1150	1150	1150	1150	1175	1175	1000	1000	1150	1150	1125	1100	1100	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	19.4%	5.6E+05	100	326	60.0	45.2	0.7	1100	1150	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	35.6%	6.8E+05	100	312	40.0	45.2	0.7	1150	1150	1175	1175	1175	1000	1000	1000	1000	1100	1100	1100	1125	1150	1150	1150	1150	1000
2470 - Metro - Baker Heaton Extension	64.0%	9.2E+05	100	321	30.0	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1150	1150	1150	1175	1150	1175	1175	1175	1175
2470 - Metro - Baker Heaton Extension	49.1%	7.1E+05	100	319	30.0	45.2	0.7	1150	1175	1175	1175	1175	1175	1000	1000	1000	1125	1125	1125	1150	1150	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	73.1%	7.0E+05	100	326	20.0	45.2	0.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	75.5%	3.0E+05	100	329	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	73.3%	2.9E+05	100	321	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	71.4%	2.8E+05	100	318	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	24.8%	9.7E+04	100	318	8.2	45.2	0.7	1125	1150	1000	1000	1000	1000	1000	1000	1000	1100	1100	1125	1150	1150	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	40.7%	1.6E+05	100	299	8.2	45.2	0.7	1150	1175	1175	1000	1000	1000	1000	1000	1000	1100	1100	1100	1125	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	14.2%	5.6E+04	100	239	8.2	45.2	0.7	1100	1125	1100	1125	1150	1175	1175	1175	1175	1125	1125	1150	1150	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	30.6%	1.2E+05	100	273	8.2	45.2	0.7	1125	1100	1100	1125	1150	1175	1175	1175	1175	1150	1175	1175	1175	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	74.5%	2.9E+05	100	264	8.2	45.2	0.7	1175	1175	1000	1000	1000	1175	1175	1175	1175	1150	1125	1150	1150	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	76.1%	3.0E+05	100	263	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1150	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	74.7%	2.9E+05	100	265	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2470 - Metro - Baker Heaton Extension	64.7%	2.5E+05	100	233	8.2	45.2	0.7	1175	1150	1175	1175	1175	1000	1000	1000	1000	1175	1150	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	2.6%	1.0E+04	100	291	8.2	45.2	0.7	1100	1150	1175	1175	1175	1000	1000	1000	1000	1100	1150	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	34.1%	1.3E+05	100	248	8.2	45.2	0.7	1125	1175	1175	1175	1000	1000	1000	1000	1000	1125	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	66.2%	2.6E+05	100	299	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1150	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	52.5%	2.1E+05	100	250	8.2	45.2	0.7	1150	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000

Enhanced Shade Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2470 - Metro - Baker Heaton Extension	72.1%	2.8E+05	100	332	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	75.2%	2.9E+05	99	326	8.2	45.2	0.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2470 - Metro - Baker Heaton Extension	66.6%	2.6E+05	100	296	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2470 - Metro - Baker Heaton Extension	75.5%	3.0E+05	100	331	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	66.4%	2.6E+05	100	295	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2470 - Metro - Baker Heaton Extension	65.9%	2.6E+05	100	293	8.2	45.2	0.7	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	37.5%	1.1E+06	100	326	60.0	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	61.5%	1.2E+06	100	312	40.0	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	68.3%	9.8E+05	100	321	30.0	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2470 - Metro - Baker Heaton Extension	68.0%	9.8E+05	100	319	30.0	45.2	0.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	73.1%	7.0E+05	100	326	20.0	45.2	0.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	75.5%	3.0E+05	100	329	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000
2470 - Metro - Baker Heaton Extension	73.3%	2.9E+05	100	321	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	71.4%	2.8E+05	100	318	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	70.4%	2.8E+05	100	318	8.2	45.2	0.7	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	66.6%	2.6E+05	100	299	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	68.2%	2.7E+05	100	239	8.2	45.2	0.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	68.8%	2.7E+05	100	273	8.2	45.2	0.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	75.6%	3.0E+05	100	264	8.2	45.2	0.7	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	76.1%	3.0E+05	100	263	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	74.7%	2.9E+05	100	265	8.2	45.2	0.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2470 - Metro - Baker Heaton Extension	66.4%	2.6E+05	100	233	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	66.1%	2.6E+05	100	291	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	67.9%	2.7E+05	100	248	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2470 - Metro - Baker Heaton Extension	66.6%	2.6E+05	100	299	8.2	45.2	0.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2470 - Metro - Baker Heaton Extension	67.7%	2.7E+05	100	250	8.2	45.2	0.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000

2537 - TSWCD – Bledsoe Creek

Project Summary

Project ID	Acres
2537	22.30
Location	
Private, rural property in Washington County, bisected by Bledsoe Creek, located just west of Northwest Davidson Road.	
Program	
VEGBAC	
Lat/Long	**Number of Plants Installed**
45.63, -123.08	36,200
Stream Length	**Average Stream Width**
2,088 feet	11.1 feet
Initial Planting Year/Credit Year	**CWS Thermal Benefits/Credits**
2024/2024	0.26 million kcal/day
Plant Communities	
Riparian Forest, Scrub Shrub, and Emergent Marsh (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, riparian grass seed mix, and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2537	Project Name: TSWCD Project 2537 - Bledsoe Creek		
Project Acres: 22.30	Initial Planting Year: 2024	Initial Credit Year: 2024	Length of Stream: 2,088 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 1,740 — Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
cascara	beaked hazelnut	Alaska brome	bull thistle
native cherry	black twinberry	Blue Wildrye	Canada thistle
Oregon ash	Douglas' spirea	blunt spikerush	common velvetgrass
pacific crab apple	dune willow	California oatgrass	Himalayan blackberry
*red alder	elderberry	coastal hedgenettle	reed canary grass
vine maple	native wild rose	common sweet cicely	St. John's wort
W. v. ponderosa pine	osoberry, indian plum	common yarrow	sweet vernalgrass
western red cedar	Pacific ninebark	curlytop knotweed	
	Pacific Willow	fringecup	
	serviceberry	giant horsetail	
	Sitka Willow	lady fern	
	snowberry	Mexican hedgenettle	
	tall Oregon grape	Pacific rush	
	thimbleberry	rice cutgrass	
	*trailing blackberry	sawbeak sedge	
	wax current	Siberian springbeauty	
		*skunk cabbage	
		slender hairgrass	
		*spike bentgrass	
		tall annual willowherb	
		taperfruit shortscale sedge	
		tufted hairgrass	
		water parsely	
		western swordfern	
		willowherb	

Plant Community: Scrub-Shrub

Stems per Acre: 557 — Phase: Implementation

Native Shrub	Native Herbaceous	Invasives
beaked hazelnut	Alaska brome	Canada thistle
*Douglas' spirea	American speedwell	common velvetgrass
*dune willow	Blue Wildrye	herb Robert
elderberry	blunt spikerush	Himalayan blackberry
Pacific ninebark	common horsetail	reed canary grass
*Pacific Willow	giant horsetail	
*Sitka Willow	jointleaf rush	
trailing blackberry	marsh seedbox	
	*rice cutgrass	
	sawbeak sedge	
	skunk cabbage	
	small duckweed	
	small water forget-me-not	
	tinker's penny	
	water parsely	
	western inflated sedge	
	western swordfern	
	willowherb	

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2537 - TSWCD-Bledsoe Creek	VEGBAC	2,088	1.56	1.81	0.26	0.13	0.26

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2537 -TSWCD - Bledsoe Creek	9.1%	4.9E+04	100	144	11.1	97.5	1.0	1375	1350	1150	1175	1175	1000	1000	1000	1000	1375	1375	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	1.8%	9.6E+03	100	103	11.1	97.5	1.0	1150	1100	1100	1100	1100	1100	1100	1100	1100	1175	1150	1125	1125	1425	1400	1400	1400	1400
2537 -TSWCD - Bledsoe Creek	22.9%	1.2E+05	100	162	11.1	97.5	1.0	1175	1150	1100	1100	1100	1100	1100	1100	1100	1150	1150	1100	1100	1100	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	30.2%	1.6E+05	100	158	11.1	97.5	1.0	1175	1150	1125	1100	1100	1100	1100	1100	1100	1175	1175	1150	1125	1125	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	30.5%	1.6E+05	100	194	11.1	97.5	1.0	1175	1175	1100	1100	1100	1100	1100	1000	1000	1175	1175	1150	1100	1100	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	30.1%	1.6E+05	100	146	11.1	97.5	1.0	1175	1175	1125	1100	1100	1100	1100	1000	1000	1175	1175	1150	1100	1100	1100	1100	1125	1125
2537 -TSWCD - Bledsoe Creek	2.1%	1.1E+04	100	87	11.1	97.5	1.0	1375	1350	1300	1300	1300	1300	1300	1300	1300	1175	1175	1175	1150	1125	1125	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	29.4%	1.6E+05	100	31	11.1	97.5	1.0	1175	1175	1125	1100	1325	1325	1325	1300	1300	1175	1175	1100	1100	1100	1100	1100	1100	1125
2537 -TSWCD - Bledsoe Creek	3.0%	1.6E+04	100	100	11.1	97.5	1.0	1175	1150	1150	1100	1300	1300	1300	1300	1300	1175	1175	1175	1175	1125	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	28.3%	1.5E+05	100	134	11.1	97.5	1.0	1175	1175	1125	1100	1100	1300	1300	1300	1300	1175	1175	1150	1150	1125	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	31.3%	1.7E+05	100	190	11.1	97.5	1.0	1175	1150	1125	1125	1100	1300	1300	1300	1300	1175	1175	1175	1175	1125	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	27.6%	1.5E+05	100	194	11.1	97.5	1.0	1150	1175	1375	1350	1300	1300	1300	1300	1300	1175	1175	1175	1175	1150	1100	1100	1100	1100
2537 -TSWCD - Bledsoe Creek	6.7%	3.6E+04	100	213	11.1	97.5	1.0	1375	1350	1300	1300	1300	1300	1300	1300	1300	1375	1375	1375	1375	1375	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	11.2%	6.0E+04	100	203	11.1	97.5	1.0	1375	1175	1150	1100	1100	1100	1100	1100	1100	1375	1350	1375	1375	1375	1325	1300	1325	1350
2537 -TSWCD - Bledsoe Creek	1.9%	9.9E+03	100	119	11.1	97.5	1.0	1300	1350	1375	1175	1175	1150	1150	1125	1100	1325	1325	1325	1350	1375	1375	1375	1375	1375
2537 -TSWCD - Bledsoe Creek	5.8%	3.1E+04	100	139	11.1	97.5	1.0	1300	1325	1350	1150	1175	1175	1150	1125	1100	1300	1350	1150	1175	1175	1175	1175	1175	1150
2537 -TSWCD - Bledsoe Creek	10.3%	5.5E+04	100	135	11.1	97.5	1.0	1175	1175	1125	1125	1125	1100	1100	1100	1100	1375	1375	1325	1300	1400	1400	1400	1400	1400
2537 -TSWCD - Bledsoe Creek	0.1%	3.0E+02	88	157	11.1	97.5	1.0	1300	1300	1300	1300	1300	1300	1300	1325	1350	1400	1400	1400	1400	1400	1400	1400	1000	1000
2537 -TSWCD - Bledsoe Creek	1.9%	1.0E+04	100	170	11.1	97.5	1.0	1325	1325	1350	1350	1300	1300	1300	1325	1300	1400	1400	1400	1400	1400	1400	1400	1400	1400
2537 -TSWCD - Bledsoe Creek	3.7%	2.0E+04	100	174	11.1	97.5	1.0	1350	1375	1375	1350	1325	1300	1325	1325	1300	1300	1325	1325	1450	1475	1450	1425	1400	1425
2537 -TSWCD - Bledsoe Creek	3.7%	2.0E+04	100	154	11.1	97.5	1.0	1325	1325	1300	1400	1400	1425	1125	1125	1125	1375	1350	1375	1350	1325	1325	1400	1400	1400

Enhanced Shade Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2537 -TSWCD - Bledsoe Creek	9.9%	5.3E+04	100	144	11.1	97.5	1.0	1375	1375	1175	1175	1175	1000	1000	1000	1000	1375	1375	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	3.0%	1.6E+04	100	103	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1475	1475	1475	1475	1475
2537 -TSWCD - Bledsoe Creek	34.3%	1.8E+05	100	162	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	33.9%	1.8E+05	100	158	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	34.6%	1.8E+05	100	194	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	32.1%	1.7E+05	100	146	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	2.1%	1.1E+04	100	87	11.1	97.5	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	32.3%	1.7E+05	100	31	11.1	97.5	1.0	1175	1175	1175	1175	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	3.3%	1.7E+04	100	100	11.1	97.5	1.0	1175	1175	1175	1175	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	29.1%	1.6E+05	100	134	11.1	97.5	1.0	1175	1175	1175	1175	1175	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	34.5%	1.8E+05	100	190	11.1	97.5	1.0	1175	1175	1175	1175	1175	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	32.6%	1.7E+05	100	194	11.1	97.5	1.0	1175	1175	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	6.7%	3.6E+04	100	213	11.1	97.5	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	12.9%	6.9E+04	100	203	11.1	97.5	1.0	1375	1175	1175	1175	1175	1175	1175	1175	1175	1375	1375	1375	1375	1375	1375	1375	1375	1375
2537 -TSWCD - Bledsoe Creek	2.1%	1.1E+04	100	119	11.1	97.5	1.0	1375	1375	1375	1175	1175	1175	1175	1175	1175	1375	1375	1375	1375	1375	1375	1375	1375	1375
2537 -TSWCD - Bledsoe Creek	7.1%	3.8E+04	100	139	11.1	97.5	1.0	1375	1375	1375	1175	1175	1175	1175	1175	1175	1375	1375	1175	1175	1175	1175	1175	1175	1175
2537 -TSWCD - Bledsoe Creek	11.0%	5.9E+04	100	135	11.1	97.5	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1375	1375	1375	1375	1475	1475	1475	1475	1475
2537 -TSWCD - Bledsoe Creek	2.8%	1.3E+04	88	157	11.1	97.5	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1475	1475	1475	1475	1475	1475	1475	1000	1000
2537 -TSWCD - Bledsoe Creek	3.4%	1.8E+04	100	170	11.1	97.5	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1475	1475	1475	1475	1475	1475	1475	1475	1475
2537 -TSWCD - Bledsoe Creek	6.9%	3.7E+04	100	174	11.1	97.5	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1475	1475	1475	1475	1475	1475
2537 -TSWCD - Bledsoe Creek	5.2%	2.8E+04	100	154	11.1	97.5	1.0	1375	1375	1375	1475	1475	1475	1175	1175	1175	1375	1375	1375	1375	1375	1375	1475	1475	1475

2540 -TSWCD– East Fork Dairy Creek

Project Summary

Project ID	Acres
2540	8.31
Location	
Private, rural property in Washington County, bisected by East Fork Dairy Creek, located just west of Northwest Dairy Creek Road.	
Program	
VEGBAC	
Lat/Long	**Number of Plants Installed**
45.64, -123.04	17,300
Stream Length	**Average Stream Width**
2,300 feet	26 feet
Initial Planting Year/Credit Year	**CWS Thermal Benefits/Credits**
2024/2024	18.57 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, riparian grass seed mix, and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2540	Project Name: TSWCD Project 2540 - East Fork Dairy Creek		
Project Acres: 8.31	Initial Planting Year: 2024	Initial Credit Year: 2024	Length of Stream: 2,300 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 2,018 — Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
cascara	beaked hazelnut	bracken fern	bull thistle
*Oregon ash	black twinberry	fringecup	Canada thistle
Oregon oak	clustered wild rose	giant horsetail	common velvetgrass
red alder	Douglas' spirea	Mexican hedgenettle	herb Robert
W. v. ponderosa pine	dune willow	needleleaf navarretia	Himalayan blackberry
	elderberry	Pacific bleeding heart	reed canary grass
	oceanspray	Pacific waterleaf	St. John's wort
	osoberry, indian plum	piggyback	
	Pacific Willow	redroot amaranth	
	red elderberry	scouring rush	
	red flowering currant	spike bentgrass	
	*red-osier dogwood	stinging nettle	
	Scouler’s Willow	taperfruit shortscale sedge	
	snowberry	western swordfern	
	tall Oregon grape	willowherb	
	thimbleberry		
	*trailing blackberry		

Management Actions

Completed: 2024	Recommended: 2025
☑ Interplant	☑ Interplant
☑ Invasive weed treatment	☑ Invasive weed treatment
☑ Seeding	☐ Seeding
☐ Herbivore Control	☐ Herbivore Control
☐ Other	☐ Other
☑ Monitoring for Adaptive Management	☑ Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2540 - TSWCD - East Fork Dairy Creek	VEGBAC	2,300	7.92	20.30	12.38	6.19	18.57

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK– *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2540 - TSWCD - East Fork Dairy Creek	34.3%	4.3E+05	100	195	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	3.8%	4.8E+04	100	160	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1125	1125	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	1.2%	1.5E+04	100	77	26.0	45.0	14.7	1100	1100	1100	1100	1000	1000	1000	1000	1000	1100	1100	1150	1125	1100	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	21.3%	2.7E+05	100	123	26.0	45.0	14.7	1100	1100	1100	1100	1100	1100	1100	1000	1000	1125	1100	1125	1150	1150	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	13.6%	1.7E+05	100	172	26.0	45.0	14.7	1100	1100	1100	1100	1100	1100	1000	1000	1000	1100	1150	1150	1150	1125	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	0.5%	6.2E+03	100	124	26.0	45.0	14.7	1100	1100	1100	1100	1100	1125	1125	1125	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	3.1%	3.9E+04	100	180	26.0	45.0	14.7	1100	1100	1100	1125	1125	1100	1100	1125	1125	1100	1100	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	24.0%	3.0E+05	100	175	26.0	45.0	14.7	1100	1125	1150	1125	1125	1100	1100	1100	1100	1125	1125	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	3.3%	4.1E+04	100	71	26.0	45.0	14.7	1100	1125	1150	1000	1000	1000	1000	1000	1000	1100	1100	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	20.7%	2.6E+05	100	65	26.0	45.0	14.7	1100	1100	1100	1100	1100	1000	1000	1000	1000	1125	1100	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	26.3%	3.3E+05	100	99	26.0	45.0	14.7	1100	1100	1100	1100	1000	1000	1000	1000	1000	1125	1100	1100	1100	1000	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	41.4%	5.2E+05	100	121	26.0	45.0	14.7	1100	1100	1100	1100	1000	1000	1000	1000	1000	1150	1150	1100	1100	1100	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	11.6%	1.4E+05	100	161	26.0	45.0	14.7	1100	1100	1100	1125	1125	1125	1000	1000	1000	1100	1100	1100	1125	1175	1175	1175	1000	1000
2540 - TSWCD - East Fork Dairy Creek	42.9%	5.3E+05	100	232	26.0	45.0	14.7	1150	1150	1100	1100	1100	1100	1100	1100	1100	1125	1100	1100	1100	1000	1000	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	43.3%	5.4E+05	100	229	26.0	45.0	14.7	1150	1150	1100	1100	1000	1000	1000	1000	1000	1125	1100	1100	1100	1100	1100	1150	1150	1150
2540 - TSWCD - East Fork Dairy Creek	10.3%	1.3E+05	100	157	26.0	45.0	14.7	1125	1125	1100	1100	1000	1000	1000	1000	1000	1100	1100	1100	1100	1100	1100	1100	1100	1100
2540 - TSWCD - East Fork Dairy Creek	42.0%	5.2E+05	100	144	26.0	45.0	14.7	1125	1125	1100	1100	1000	1000	1000	1000	1000	1125	1150	1175	1175	1175	1175	1150	1150	1150
2540 - TSWCD - East Fork Dairy Creek	20.5%	2.6E+05	100	124	26.0	45.0	14.7	1100	1100	1100	1100	1000	1000	1000	1000	1000	1100	1150	1175	1175	1150	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	34.0%	4.2E+05	100	97	26.0	45.0	14.7	1125	1100	1100	1100	1000	1000	1000	1000	1000	1125	1150	1150	1175	1175	1175	1175	1000	1000
2540 - TSWCD - East Fork Dairy Creek	64.8%	8.1E+05	100	164	26.0	45.0	14.7	1125	1175	1175	1150	1125	1125	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	64.3%	8.0E+05	100	210	26.0	45.0	14.7	1175	1175	1175	1150	1100	1100	1100	1000	1000	1150	1175	1175	1175	1175	1175	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	68.0%	8.5E+05	100	145	26.0	45.0	14.7	1150	1125	1100	1100	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	39.7%	4.9E+05	100	165	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1000	1000	1000	1000	1000

Enhanced Shade Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK– *code only vegetation that CWS is responsible for*									RIPARIAN CODES – RIGHT BANK– *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2540 - TSWCD - East Fork Dairy Creek	34.3%	4.3E+05	100	195	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	49.3%	6.2E+05	100	160	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	76.7%	9.6E+05	100	77	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	74.8%	9.3E+05	100	123	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	77.7%	9.7E+05	100	172	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	75.0%	9.4E+05	100	124	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	74.9%	9.4E+05	100	180	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	77.0%	9.6E+05	100	175	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	73.7%	9.2E+05	100	71	26.0	45.0	14.7	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	73.8%	9.2E+05	100	65	26.0	45.0	14.7	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	70.4%	8.8E+05	100	99	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	74.5%	9.3E+05	100	121	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	80.0%	1.0E+06	100	161	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2540 - TSWCD - East Fork Dairy Creek	72.2%	9.0E+05	100	232	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	71.6%	8.9E+05	100	229	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	79.4%	9.9E+05	100	157	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	77.9%	9.7E+05	100	144	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	74.8%	9.3E+05	100	124	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2540 - TSWCD - East Fork Dairy Creek	70.6%	8.8E+05	100	97	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2540 - TSWCD - East Fork Dairy Creek	74.7%	9.3E+05	100	164	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	68.9%	8.6E+05	100	210	26.0	45.0	14.7	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	78.1%	9.7E+05	100	145	26.0	45.0	14.7	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2540 - TSWCD - East Fork Dairy Creek	46.6%	5.8E+05	100	165	26.0	45.0	14.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000

2565 - Fanno Creek – Durham WRRF

Project Summary

Project ID	Acres
2565	1.85
Location	
Public, urban property in City of Tigard, directly adjacent to Fanno Creek, located South of Durham Road.	
Program	
Capital	
Lat/Long	**Number of Plants Installed**
45.40, -122.75	25,562*
Stream Length	**Average Stream Width**
379 feet	22.3 feet
Initial Planting Year/Credit Year	**CWS Thermal Benefits/Credits**
2024/2024	0.10 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
None	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, and riparian plantings	
Instream Enhancement Activities	
None	

*This project is tracked in combination with other enrolled projects. The number of plants referenced here is for the larger combination of projects. The actual number of plants installed for this project is a subset of this count.

Project Number: 2565	Project Name: Fanno Creek - Durham WWTP		
Project Acres: 1.85	Initial Planting Year: 2024	Initial Credit Year: 2024	Length of Stream: 379 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 2,900 — Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	beaked hazelnut	Blue Wildrye	common hawthorn
Oregon ash	black twinberry	denseflower willowherb	common velvetgrass
*red alder	clustered wild rose	fowl bluegrass	English ivy
vine maple	Douglas' spirea	fringecup	Himalayan blackberry
	elderberry	*giant horsetail	poison hemlock
	native wild rose	grand collomia	shiny geranium
	oceanspray	horseweed	St. John's wort
	osoberry, indian plum	large-leaved avens	tansy ragwort
	Pacific ninebark	slender hairgrass	
	red flowering currant	spike bentgrass	
	red-osier dogwood	taperfruit shortscale sedge	
	serviceberry	willowherb	
	*snowberry		
	thimbleberry		
	trailing blackberry		

Management Actions

Completed: 2024	Recommended: 2025
☐ Interplant	☐ Interplant
☐ Invasive weed treatment	☐ Invasive weed treatment
☐ Seeding	☐ Seeding
☐ Herbivore Control	☐ Herbivore Control
☐ Other	☐ Other
☑ Monitoring for Adaptive Management	☑ Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2565 - Fanno Creek-Durham WWRF	Capital	379	2.10	2.16	0.051	0.025	0.10

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2565 - Fanno Creek - Durham WWTP	51.4%	5.5E+05	100	154	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2565 - Fanno Creek - Durham WWTP	53.1%	4.5E+05	79	136	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1125	1100	1100	1100	1100	1125
2565 - Fanno Creek - Durham WWTP	49.0%	5.2E+05	100	149	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1150	1125	1150	1175	1175	1175	1175
2565 - Fanno Creek - Durham WWTP	54.5%	5.8E+05	100	137	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1150	1150	1175	1125	1000

Enhanced Shade Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2565 - Fanno Creek - Durham WWTP	51.4%	5.5E+05	100	154	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2565 - Fanno Creek - Durham WWTP	54.7%	4.6E+05	79	136	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2565 - Fanno Creek - Durham WWTP	52.4%	5.6E+05	100	149	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2565 - Fanno Creek - Durham WWTP	54.5%	5.8E+05	100	137	22.3	24.7	4.0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000

2584 -Wapato TRNWR – East Side Levee

Project Summary

Project ID	Acres
2584	66.04
Location	
Public, rural property in Washington County, directly adjacent to Hill Creek, located east of Tualatin Valley Highway.	
Program	
Capital	
Lat/Long	**Number of Plants Installed**
45.43, -123.12	2,500
Stream Length	**Average Stream Width**
8,900 feet	25.6 feet
Initial Planting Year/Credit Year	**CWS Thermal Benefits/Credits**
2024/2024	97.61 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
U.S. Fish & Wildlife	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2584	Project Name: Wapato TRNWR - East Side Levee		
Project Acres: 66.04	Initial Planting Year: 2024	Initial Credit Year: 2024	Length of Stream: 8,900 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 987 — Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
black hawthorn	beaked hazelnut	beggarticks	bull thistle
Oregon ash	black twinberry	bluehead gilia	Canada thistle
Oregon oak	clustered wild rose	cleavers	common hawthorn
	Douglas' spirea	common beggarticks	common velvetgrass
	nootka rose	common madia	Himalayan blackberry
	Scouler’s Willow	cottonbatting plant	morning-glory
	snowberry	Cusick's popcornflower	pennyroyal
	tall Oregon grape	fowl bluegrass	reed canary grass
	thimbleberry	golden nutsedge	St. John's wort
	trailing blackberry	gumweed	tansy ragwort
		gumweed genus	
		horseweed	
		lance self heal	
		marsh horsetail	
		marsh seedbox	
		marsh yellowcress	
		Mexican mosquito fern	
		minature lupine	
		mountain tarweed	
		neckweed	
		nodding beggarticks	
		redroot amaranth	
		*slender hairgrass	
		slough sedge	
		small duckweed	
		small water forget-me-not	
		Spearscale	
		spike bentgrass	
		tall annual willowherb	
		tarweed	
		water foxtail	
		western swordfern	
		willowherb	

Management Actions

Completed: 2024	Recommended: 2025
☐ Interplant	☑ Interplant
☑ Invasive weed treatment	☑ Invasive weed treatment
☐ Seeding	☑ Seeding
☐ Herbivore Control	☐ Herbivore Control
☐ Other	☐ Other
☑ Monitoring for Adaptive Management	☑ Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2584 - Wapato TRNWR - East Side Levee	Capital	8,900	5.98	45.02	39.05	19.52	97.61

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	339	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	334	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	335	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	337	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	337	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	337	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	336	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	8.8%	2.2E+04	100	336	5.3	25.3	5.0	1100	1100	1150	1150	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	1.7%	4.2E+03	100	339	5.3	25.3	5.0	1100	1100	1100	1125	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	341	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	341	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	342	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	344	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	344	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	339	5.3	25.3	5.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	4.2%	6.1E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1150	1175	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	7.8%	1.1E+05	100	353	30.4	42.7	4.4	1100	1100	1100	1150	1175	1175	1150	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	10.4%	1.5E+05	100	353	30.4	42.7	4.4	1100	1100	1125	1175	1175	1175	1175	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	10.4%	1.5E+05	100	353	30.4	42.7	4.4	1100	1100	1125	1175	1175	1175	1175	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	6.4%	9.3E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1175	1175	1175	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000

Baseline Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK– *code only vegetation that CWS is responsible for*									RIPARIAN CODES – RIGHT BANK– *code only vegetation that CWS is responsible for*								
	Effective Shade (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2584 - Wapato TRNWR - East Side Levee	4.8%	7.0E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1125	1175	1175	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	4.0%	5.9E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1125	1175	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	1.1%	1.6E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1125	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	21.5%	3.1E+05	100	353	30.4	42.7	4.4	1150	1100	1100	1100	1100	1100	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	21.1%	3.1E+05	100	353	30.4	42.7	4.4	1150	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	355	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	359	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	1.1%	1.6E+04	100	1	30.4	42.7	4.4	1100	1100	1100	1100	1100	1125	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	1.1%	1.7E+04	100	1	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1125	1125	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	18.1%	2.6E+05	100	0	30.4	42.7	4.4	1125	1125	1125	1150	1150	1150	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	14.6%	2.1E+05	100	359	30.4	42.7	4.4	1100	1125	1175	1175	1150	1175	1175	1175	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	6.3%	9.1E+04	100	356	30.4	42.7	4.4	1100	1100	1100	1125	1150	1175	1175	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	25.7%	3.8E+05	100	353	30.4	42.7	4.4	1150	1100	1125	1150	1150	1125	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	32.1%	4.7E+05	100	349	30.4	42.7	4.4	1175	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	33.9%	5.0E+05	100	347	30.4	42.7	4.4	1175	1125	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.6%	1.7E+05	100	347	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.6%	1.7E+05	100	348	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	349	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	349	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	22.2%	3.2E+05	100	347	30.4	42.7	4.4	1150	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	23.8%	3.5E+05	100	349	30.4	42.7	4.4	1150	1125	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	349	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	347	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.6%	1.7E+05	100	347	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	347	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.7%	1.7E+05	100	345	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	342	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	341	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	341	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	341	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.9%	1.7E+05	100	341	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	11.9%	1.7E+05	100	341	30.4	42.7	4.4	1125	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	340	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	350	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	358	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.7%	1.0E+04	100	355	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1125	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	4.9%	7.2E+04	100	355	30.4	42.7	4.4	1100	1100	1100	1125	1175	1125	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	5.6%	8.2E+04	100	355	30.4	42.7	4.4	1100	1100	1100	1100	1175	1175	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	7.2%	1.0E+05	100	355	30.4	42.7	4.4	1100	1100	1100	1125	1175	1175	1175	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	6.8%	9.9E+04	100	357	30.4	42.7	4.4	1100	1100	1100	1125	1175	1175	1150	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	3.6%	5.2E+04	100	357	30.4	42.7	4.4	1100	1100	1100	1100	1100	1125	1175	1175	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.5%	7.3E+03	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.5%	7.3E+03	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000

Baseline Conditions (cont.)

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK– *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK– *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2584 - Wapato TRNWR - East Side Levee	6.5%	9.4E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1125	1150	1175	1175	1150	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	0.0%	0.0E+00	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	2.4%	3.6E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1125	1125	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	3.4%	5.0E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1100	1175	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	5.9%	8.6E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1175	1175	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	6.7%	9.8E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1125	1175	1175	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	5.5%	8.0E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1100	1150	1175	1175	1125	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	6.7%	9.8E+04	100	353	30.4	42.7	4.4	1100	1100	1100	1125	1175	1175	1150	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000

Enhanced Shade Conditions

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2584 - Wapato TRNWR - East Side Levee	55.5%	1.4E+05	100	339	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	45.3%	6.6E+05	100	334	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	45.1%	6.6E+05	100	335	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	44.9%	6.5E+05	100	336	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	44.6%	6.5E+05	100	337	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	44.6%	6.5E+05	100	337	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.3%	1.4E+05	100	337	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.2%	1.4E+05	100	336	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.5%	1.4E+05	100	339	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.7%	1.4E+05	100	341	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.7%	1.4E+05	100	341	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.8%	1.4E+05	100	342	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	56.0%	1.4E+05	100	344	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	56.0%	1.4E+05	100	344	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	55.5%	1.4E+05	100	339	5.3	25.3	5.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.1%	5.7E+05	100	355	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	37.5%	5.5E+05	100	359	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	36.7%	5.4E+05	100	1	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	36.7%	5.4E+05	100	1	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	37.1%	5.4E+05	100	0	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	37.5%	5.5E+05	100	359	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	38.7%	5.7E+05	100	356	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.3%	6.0E+05	100	349	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.6%	6.1E+05	100	348	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000

Enhanced Shade Conditions (cont.)

	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK-- *code only vegetation that CWS is responsible for*									RIPARIAN CODES -- RIGHT BANK-- *code only vegetation that CWS is responsible for*								
PROJECT	**Effective Shade** (%)	**Thermal Load Blocked** (kcal/d)	**Segment Length** (ft)	**Orientation** (0 deg=N)	**Wetted Width** (ft)	**NSDZ Width** (ft)	**Channel Incision** (ft)	**LB** 0-15 ft	**LB** 15-30 ft	**LB** 30-45ft	**LB** 45-60 ft	**LB** 60-75 ft	**LB** 75-90 ft	**LB** 90-105 ft	**LB** 105-120 ft	**LB** 120-135 ft	**RB 0-15 ft**	**RB 15-30 ft**	**RB 30-45ft**	**RB 45-60 ft**	**RB 60-75 ft**	**RB 75-90 ft**	**RB 90-105 ft**	**RB 105-120 ft**	**RB 120-135 ft**
2584 - Wapato TRNWR - East Side Levee	41.3%	6.0E+05	100	349	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.3%	6.0E+05	100	349	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.3%	6.0E+05	100	349	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.3%	6.0E+05	100	349	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	41.9%	6.1E+05	100	347	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	42.5%	6.2E+05	100	345	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.4%	6.3E+05	100	342	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.6%	6.4E+05	100	341	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.6%	6.4E+05	100	341	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.6%	6.4E+05	100	341	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.6%	6.4E+05	100	341	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.6%	6.4E+05	100	341	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	43.9%	6.4E+05	100	340	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	40.9%	6.0E+05	100	350	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	37.9%	5.5E+05	100	358	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.1%	5.7E+05	100	355	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.1%	5.7E+05	100	355	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.1%	5.7E+05	100	355	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.1%	5.7E+05	100	355	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	38.3%	5.6E+05	100	357	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	38.3%	5.6E+05	100	357	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2584 - Wapato TRNWR - East Side Levee	39.9%	5.8E+05	100	353	30.4	42.7	4.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000

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Appendix B

Riparian Shade Planting Projects (2004-2024)

Appendix B: Riparian Shade Planting Projects (2004-2024)

Appendix B presents a summary of the 213 riparian shade projects enrolled in CWS' water quality trading program. The project name, credit year, project characteristics (average wetted width and stream length), and the thermal credit claimed by CWS are presented in Table B. In previous years, the average wetted width and stream length were reported as rounded values. CWS takes thermal credit for those projects for which a valid contract or agreement is in place. For projects that do not have a landowner contract in place, CWS conducts routine shade monitoring using LiDAR and aerial imagery and takes thermal credits if they are providing the expected canopy cover. All projects identified in Table B are active and enrolled in CWS' water quality credit trading program.

Table B: Active Riparian Shade Planting Projects (2004-2024)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
121	Tualatin River - Thomas Dairy	Active	2004	210	500	3.16
122	Summer Creek - Fowler	Active	2004	9.9	1,600	1.55
123	Fanno Creek - Englewood	Active	2004	8.9	4,400	6.77
126	Rock Creek - Evergreen to Cornell	Active	2004	19.7	2,500	4.41
131	Rock Creek - WWTP	Active	2004	22	700	0.84
136	Johnson Creek South - Summercrest	Active	2004	1.9	1,800	0.60
138	Bronson Creek - W Union to Laidlaw	Active	2004	4.7	5,400	3.15
1166	Fanno Creek - OES Marsh	Active	2004	9.3	1,300	2.04
1767	Cedar Creek - Stella Olsen	Active	2004	15	1,500	4.08
10	Council Creek - Beal Pond	Active	2005	156.1	700	10.40
21	Rock Creek - Amberwood Natural Area	Active	2005	17.7	900	0.19
25	Dawson Creek - Evergreen Blvd	Active	2005	8.3	1,800	1.36
27	Rock Creek - Trail - Evergreen to Hwy 26	Active	2005	20	800	3.07
36	Beaverton Creek - Transit Center	Active	2005	12.4	1,500	2.70
78	North Johnson Creek - Cedar Mill Wetlands	Active	2005	13.2	800	0.08
95	95 - TSWCD - McFee Creek Tributary	Active	2005	2	2,700	0.97
124	Willow Creek - Bronson Rd	Active	2005	4.8	800	0.04
129	Sylvan Creek - Raleighwood Marsh	Active	2005	7	2,100	3.14
141	Fanno Creek - Hall Blvd to Ash Ave	Active	2005	21	2,100	6.45
142	Gales Creek - Tualatin River to Hwy 47	Active	2005	26	4,000	14.60
1040	Rock Creek - Golf Course to Bethany Pond	Active	2005	14.4	2,900	7.62
1421	Hedges Creek - Upper Marsh	Active	2005	12.7	900	1.69
138	Bronson Creek - W Union to Laidlaw	Active	2005	5	900	1.06
126	Rock Creek Evergreen to Cornell	Active	2005	20	3,400	8.69
131	Rock Creek - WWTP	Active	2005	22	2,300	4.27
18	Banks Elementary	Active	2006	1.6	600	0.19
65	Fanno Creek tributary - Downing to 125th	Active	2006	0.9	600	0.11
94	94 - TSWCD - East Fork Dairy Creek	Active	2006	12.3	5,300	4.12
96	96 - TSWCD - Tualatin River	Active	2006	46.9	6,300	25.30
97	97 - TSWCD - West Fork Dairy Creek	Active	2006	20	2,400	4.13

Table B-1: Active Riparian Shade Planting Projects (2004-2024) (Continued)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
102	102 - TSWCD - West Fork Dairy Creek	Active	2006	8	1,300	0.21
114	114 - TSWCD - Tualatin River	Active	2006	45.4	1,800	7.30
137	Willow Creek - Beaverton Creek Confluence	Active	2006	11.8	1,300	1.43
1020	Dairy Creek - Davis Tool	Active	2006	42	4,900	4.76
1160	Johnson Creek - Lowami Hart Woods	Active	2006	6	500	0.52
1181	1181 - TSWCD - Tualatin River	Active	2006	29.6	10,700	14.90
1422	Beaverton Creek - 153rd to St Marys	Active	2006	9.3	4,900	9.36
10	Council Creek - Beal Pond	Active	2006	156	500	0.11
1767	Cedar Creek - Stella Olsen	Active	2006	15	700	1.12
123	Fanno Creek - Englewood	Active	2006	9	2,500	1.50
1141	1141 - TSWCD - Council Creek Tributary	Active	2007	4	6,300	4.64
104	104 - TSWCD - McFee Creek	Active	2007	7.9	1,500	0.73
105	105 - TSWCD - Tualatin River	Active	2007	33.2	1,800	5.81
109	109 - TSWCD - West Fork Dairy Creek	Active	2007	20	1,600	2.55
110	110 - TSWCD - Chicken Creek Tributary	Active	2007	3	800	0.40
112	112 - TSWCD - Tualatin River	Active	2007	43.3	8,200	31.30
125	Beaverton Creek - Quatama - 205th Ave to 231st Ave	Active	2007	23	7,300	13.90
132	Tualatin River - Gales Creek to Fernhill Rd	Active	2007	44.9	4,300	9.79
1140	1140 - TSWCD - Council Creek Tributary	Active	2007	9.5	1,100	2.18
1522	1522 - TSWCD - Abbey Creek	Active	2007	6.4	1,500	1.58
1524	1524 - TSWCD - Rock Creek	Active	2007	10	1,600	2.57
1767	Cedar Creek - Stella Olsen	Active	2007	15	700	0.34
12	Tualatin River - Metro King	Active	2008	56.8	800	3.61
117	Metro - Lovejoy	Active	2008	44.5	8,100	21.80
128	Bronson Creek - Tanasbrook Ponds	Active	2008	6.7	2,700	3.04
143	Gales Creek - B St to Hwy 47	Active	2008	23	3,300	4.49
1080	Fanno Creek - Greenway Park	Active	2008	10.6	6,000	9.15
1886	1886 - TSWCD - Abbey Creek Tributary	Active	2008	2.6	700	0.22
1907	1907 - TSWCD - West Fork Dairy Creek	Active	2008	10	600	0.01
1927	1927 - TSWCD - Cedar Creek	Active	2008	8	900	1.51
1930	1930 - TSWCD - Bledsoe Creek	Active	2008	5	1,100	1.00
103	103 - TSWCD - East Fork Dairy Creek	Active	2009	11.4	3,100	0.81
107	107 - TSWCD - Tualatin River Tributary	Active	2009	5	600	0.03
108	108 - TSWCD - Tualatin River	Active	2009	50	3,600	5.19
113	113 - TSWCD - Chicken Creek	Active	2009	5	500	0.26
100	TRNWR - Dennis	Active	2009	120	4,700	3.48
115	Metro - Munger	Active	2009	120	2,100	0.69
2007	2007 - TSWCD - West Fork Dairy Creek	Active	2009	15	2,800	0.70
1080	Fanno Creek - Greenway Park	Active	2009	9	1,100	0.71

Table B-1: Active Riparian Shade Planting Projects (2004-2024) (Continued)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
130	Tualatin River - Eagle Woods at Fern Hill	Active	2010	23	1,100	0.69
116	116 - TSWCD - East Fork Dairy Creek	Active	2010	36	2,879	5.38
1906	1906 - TSWCD - McKay Creek	Active	2010	20	5,900	8.74
2049	Rock Creek - Noble Woods	Active	2010	19	1,170	2.39
2051	2051 - TSWCD - Bledsoe Creek	Active	2010	5	2,643	2.36
2052	2052 - TSWCD - Gales Creek	Active	2010	40	900	1.98
2087	Gales Creek - Half Mile Lane	Active	2011	27	1,306	2.62
2097	2097 - TSWCD - Gales Creek	Active	2011	75	3,755	15.70
131	Rock Creek - WWTP	Active	2011	8	3,022	2.15
135	Willow Creek Enhancement	Active	2012	8	1,190	1.55
2105	2105 - TSWCD - Carpenter Creek	Active	2012	4	1,756	0.32
2106	2106 - TSWCD - Tualatin River	Active	2012	30	1,969	2.31
2122	2122 - TSWCD - Gales Creek	Active	2012	7.6	2,800	1.03
1181	1181 - TSWCD - Tualatin River	Active	2012	6	3,300	3.20
2100	2100 - TSWCD - Tualatin River	Active	2013	11.8	4,272	2.76
2101	2101 - TSWCD - Christensen Creek	Active	2013	3	1,693	1.07
2102	2102 - TSWCD - Christensen Creek	Active	2013	3	1,700	0.91
2103	2103 - TSWCD - Tualatin River	Active	2013	16.8	4,082	9.78
2126	2126 - TSWCD - Cedar Creek Tributary	Active	2013	2	587	0.17
2128	2128 - TSWCD - Jackson Creek	Active	2013	5	679	0.28
2129	2129 - TSWCD - Jackson Creek	Active	2013	5	700	0.45
2140	2140 - TSWCD - Gales Creek	Active	2013	40	2,054	5.38
124	Willow Creek - Bronson Rd	Active	2013	7.4	500	0.29
17	Durham City Park	Active	2014	20	4,193	3.48
2093	Barrows Meadows	Active	2014	6	800	0.16
2130	2130 - TSWCD - Gales Creek	Active	2014	35	5,052	11.30
2131	2131 - TSWCD - McKay Creek	Active	2014	30	4,161	5.74
2135	Bronson Creek Greenway	Active	2015	5.8	4,600	0.08
2137	2137 - TSWCD - Gales Creek	Active	2015	25	2,257	2.63
2138	2138 - TSWCD - Little Beaver Creek	Active	2015	7.5	572	0.71
2139	2139 - TSWCD - Carpenter Creek	Active	2015	6	4,023	1.74
2142	2142 - TSWCD - Little Beaver Creek	Active	2015	11.7	5,161	3.30
2168	Tualatin River Farm	Active	2015	66	2,794	0.89
1767	Cedar Creek - Stella Olsen	Active	2015	16	2,027	2.29
2099	2099 - TSWCD - Tualatin River	Active	2016	55	3,700	1.60
2199	TRNWR - Naujock	Active	2016	118	6,400	5.90
2163	2163 - TSWCD - Little Beaver Creek	Active	2016	4	1,350	0.98
2164	2164 - TSWCD - Gales Creek Tributary	Active	2016	25	2,070	0.15
2165	2165 - TSWCD - McKay Creek	Active	2016	12	3,693	0.05
2166	2166 - TSWCD - Dairy Creek	Active	2016	19	1,375	0.06
2184	Metro - Maroon Ponds Natural Area	Active	2016	45	2,700	3.30

Table B-1: Active Riparian Shade Planting Projects (2004-2024) (Continued)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
2201	2201 - TSWCD - Tualatin River	Active	2016	52	2,247	2.80
2202	2202 - TSWCD - East Fork Dairy Creek	Active	2016	33.1	3,397	3.20
2203	2203 - TSWCD - Council Creek	Active	2016	7	1,071	0.10
2204	2204 - TSWCD - McKay Creek	Active	2016	30	2,500	3.20
2205	2205 - TSWCD - Tualatin River	Active	2016	64	3,000	0.31
2206	2206 - TSWCD - McFee Creek	Active	2016	11	550	0.27
2207	2207 - TSWCD - Tualatin River	Active	2016	50	500	0.26
2208	2208 - TSWCD - McKay Creek Tributary	Active	2016	9.3	2,046	2.20
2209	2209 - TSWCD - McKay Creek	Active	2016	28	1,091	0.32
2216	Beaverton Creek - Quatama - 197th Ave	Active	2016	32	1,676	1.30
2186	Metro - Woodard Natural Area	Active	2017	32	752	0.89***
2190	Metro - Farmington Natural Area	Active	2017	123	599	0.83
2213	2213 - TSWCD - West Fork Dairy Creek	Active	2017	19	7,890	10.43***
2218	Beaverton Creek - Quatama - 185th Ave	Active	2017	18	1,454	1.04
2260	2260 - TSWCD - McFee Creek	Active	2017	15	800	0.22
2261	2261 - TSWCD - Davis Creek	Active	2017	4	1,374	1.05***
2262	2262 - TSWCD - Abbey Creek	Active	2017	4	1,530	0.19
2263	Fanno Creek - Crawford Reach	Active	2017	28	800	1.09
2265	Wapato View	Active	2017	2	5,045	1.41
2345	Metro - Carpenter Creek S	Active	2017	16	1,800	3.95
2346	Metro - Carpenter Creek N	Active	2017	16	382	0.90
1644	Banks High School	Active	2018	4	587	0.17
2043	Gales Creek at B Street Bridge	Active	2018	57	1,400	0.80
2187	Metro - Bonita Natural Area	Active	2018	6.3	1,732	1.57
2210	2210 - TSWCD - East Fork Dairy Creek	Active	2018	21	4,866	2.19
2215	2215 - TSWCD - Graver Creek	Active	2018	4.3	700	0.50
2259	2259 - TSWCD - McFee Creek	Active	2018	16.9	2,100	2.71
2318	2318 - TSWCD - Storey Creek	Active	2018	3	785	0.49
2321	2321 - TSWCD - McKay Creek Tributary	Active	2018	5.7	468	0.31
2322	2322 - TSWCD - Gales Creek	Active	2018	24.5	2,153	1.18
2324	2324 - TSWCD - Iler Creek	Active	2018	8.8	1,900	0.20
2327	2327 - TRNWR - Dennis Expansion Area	Active	2018	127.5	2,000	3.86
2333	2333 - TSWCD - Gales Creek	Active	2018	26.7	1,300	1.13
2414	2414 - TSWCD - East Fork Dairy Creek	Active	2018	32.2	5,089	0.81
2449	2449 - Steed Creek Expansion	Active	2018	4	500	0.41
6701	6701 - Bethany Creek Enhancement	Active	2018	3	1,377	0.45
78	78 - North Johnson Creek - Cedar Mill Wetlands	Active	2019	12.5	887	0.26
98	98 - TSWCD - Tualatin River Tributary	Active	2019	11.0	900	0.06
1807	1807 - Hedges Creek Marsh	Active	2019	49.5	3,395	0.10
2019	2019 - Chicken Creek at Green Heron	Active	2019	17.9	686	0.97
2075	2075 - Summer Creek - 116th to Fowler	Active	2019	15.0	1,000	0.79
2081	2081 - Grace Johnson	Active	2019	33.1	4,500	5.00
2116	2116 - Jack Park	Active	2019	1.8	2,253	0.18

Table B-1: Active Riparian Shade Planting Projects (2004-2024) (Continued)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
2144	2144 - Fanno Creek - Ash Ave to Main St	Active	2019	13.0	1,400	1.85
2145	2145 - Woodhaven Park	Active	2019	2.1	700	0.16
2235	2235 - THPRD - Whispering Woods	Active	2019	26.6	2,200	5.27
2264	2264 - TRNWR - Oleson	Active	2019	30.0	1,400	0.26
2277	2277 - Spring Hill	Active	2019	23.4	9,527	15.9
2320	2320 - TSWCD - McKay Creek	Active	2019	24.8	393	0.02
2325	2325 - TSWCD - McKay Creek	Active	2019	50.0	575	0.06
2326	2326 - TSWCD - McKay Creek	Active	2019	40.0	383	0.16
2335	2335 - Metro - Baker Heaton	Active	2019	11.3	5,041	3.71
2336	2336 - Metro - Middle Baker	Active	2019	11.0	3,350	2.59
2351	2351 - Metro - River's Bend Munger	Active	2019	115.6	3,559	1.17
2379	2379 - Nyberg Creek - Stafford	Active	2020	9.3	800	0.99
2410	2410 - Upper Hedges Creek	Active	2019	19.9	1,200	0.15
2365	2365 - West Tributary Abbey Creek	Active	2020	14.7	2,720	1.04
2403	2403 - Fanno Creek - Felton Floodplain	Active	2020	23.8	1,700	0.68
2406	2406 - TSWCD - McFee Creek Tributary	Active	2020	7	1,965	0.40
2407	2407 - TSWCD - East Fork Dairy Creek	Active	2020	27	2,956	1.59
2408	2408 - TSWCD - Tualatin River	Active	2020	6	1,300	0.52
2411	2411 - Fanno Creek - Crawford Extension	Active	2020	33	961	1.39
2429	2429 - Metro - Carpenter Creek at SW Anderson Rd	Active	2020	8	800	1.00
2444	2444 - TSWCD - Dairy Creek	Active	2020	22	3,676	1.29
2445	2445 - TSWCD - Dairy Creek	Active	2020	55	1,000	0.16
2447	2447 - TSWCD - Tualatin River	Active	2020	123	2,195	0.37
2052	2052 - TSWCD - Gales Creek	Active	2021	29.5	3,519	9.02
2183	2183 - Fanno Creek - Denney Rd to Hall Blvd	Active	2021	8.5	4,385	3.25
2332	2332 - TRNWR - Bump - Brennar	Active	2021	125	2,089	0.11
2353	2353 - Metro - Dairy McKay - RF	Active	2021	32.5	5,195	2.43
2424	2424 - Bronson Creek - NW Bethany Blvd to NW 147th Pl	Active	2021	5	14,650	0.19
2443	2443 - Bronson Creek - OHSU	Active	2021	12.3	3,086	2.35
2448	2448 - NRCS - Hutchinson Wetland Reserve - O'Neil Creek	Active	2021	5.5	3,294	1.83
2485	2485 - TSWCD - McKay Creek	Active	2021	16	9,184	9.71
2492	2492 - Bronson Creek Park	Active	2021	33	851	0.96
2502	2502 - TSWCD - Dairy Creek	Active	2021	30.4	6,600	2.40
2175	2175 - McKay Creek - Swallowtail Farm	Active	2022	29.4	3,800	2.03
2283	2283 - TRNWR - Chicken Creek	Active	2022	23	14,315	16.76
2319	2319 - TSWCD - Tualatin River Tributary	Active	2022	12.8	1,072	0.16
2360	2360 - Fanno Creek - Brown Natural Area	Active	2022	17.3	51,109	5.19
2376	2376 - Dawson Creek - DVIR Daycare	Active	2022	14.3	452	0.42
2404	2404 - Dawson Creek - Port of Portland	Active	2022	11.2	4,951	0.44
2409	2409 - Lower Hedges Creek	Active	2022	68.4	2,965	0.10
2457	2457 - Glencoe Creek - Corridor	Active	2022	23.5	10,405	12.90
2469	2469 - TSWCD - Tualatin River Tributary	Active	2022	4.2	5,936	4.69
2472	2472 - Cedar Creek - Sunset	Active	2022	10.7	3,420	2.19

Table B-1: Active Riparian Shade Planting Projects (2004-2024) (Continued)

Project ID	Project Name*	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)**	CWS Thermal Credits (million kcal/d)
2486	2486 - TSWCD - Christensen Creek	Active	2022	7.2	2,666	1.19
2487	2487 - TSWCD - Tualatin River Tributary	Active	2022	4.3	648	0.51
2506	2506 - TSWCD - Clear Creek	Active	2022	10.7	599	0.25
2375	2375 - West Bethany Creek	Active	2023	2.3	3,595	0.97
2420	2420 - Balm Grove	Active	2023	28.3	1,188	2.11
2439	2439 - Ghost Creek - Sunset Creek	Active	2023	4.6	500	0.49
2501	2501 - TSWCD - McKay Creek	Active	2023	30.0	2,865	0.74
2503	2503 - Butternut Creek at 198th Ave	Active	2023	11.7	1,157	1.83
2519	2519 - TSWCD - Tualatin River	Active	2023	46.6	400	0.03
2520	2520 - TSWCD - Tualatin River	Active	2023	46.7	791	0.08
2521	2521 - TSWCD - Tualatin River	Active	2023	45.0	1,900	0.26
2522	2522 - TSWCD - Tualatin River	Active	2023	46.0	2,380	1.67
2538	2538 - TSWCD - West Fork Dairy Creek	Active	2023	23.5	900	0.61
2470	2470 - Metro-Baker Creek	Active	2024	13.5	2,600	1.38
2537	2537 - TSWCD-Bledsoe Creek	Active	2024	11.1	2,088	0.26
2540	2540 - TSWCD-East Fork Dairy Creek	Active	2024	26.0	2,300	18.57
2565	2565 - Fanno Creek	Active	2024	22.3	379	0.10
2584	2584 - Hill Creek	Active	2024	25.6	8,900	97.61

*Some project names have changed since their enrollment in the trading program to better reflect their location in the watershed. The project numbers have not changed.

**Segment Length: Some projects were enrolled over multiple years. The segment length planted each year is presented in this table.

***This number has been revised to reflect the correct thermal credits for the project.

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Appendix C

Additional Management Actions

Appendix C – Additional Management Actions

The following is a summary of actions at sites enrolled in the trading program for 10 years or more that did not provide anticipated shade as noted in previous annual reports. These sites will continue to be monitored for invasive species, and plant diversity and density. CWS' project managers evaluate project performance to determine the additional management actions to implement, including the number of plants planted each year. In 2021, CWS began aggregating plant data for riparian planting projects on the fiscal year, July 1 to June 30. Previously, calculations were performed from January 1 to December 31. As a result, plant numbers listed below may differ from previous annual reports. Completed and recommended management actions and detailed monitoring data such as recent stem density, canopy cover, and observed species can be found in CWS' site assessment reports, which are available upon request.

Project 1421: Hedges Creek – Upper Marsh

This project was planted with 1,480 native shrubs and trees in 2006 and has extensive wetland complexes, significant beaver activity, and ongoing challenges with invasive reed canary grass. This site has had focused attention including invasive weed treatment and inter-planting:

2007: 1,362 plants
2009: 770 plants
2010: 1,450 plants
2012: 1,400 plants
2013: 1,500 plants
2015: 1,450 plants
2017: 10,050 plants
2018: 20,296 plants
2019: 9,100 plants
2020: 3,250 plants
2021: 7,500 plants
2022: 1,545 plants
2023: 4,000 plants
2024: 7,200 plants

Targeted invasive species treatment and inter-planting were completed in 2024. Additional invasive species treatment and inter-planting are planned for 2025. This project will continue to be monitored for invasive species cover, and plant diversity and density.

Project 135: Willow Creek Enhancement

This project was planted with 700 native shrubs and trees in 2006 and has extensive wetland complexes, significant beaver activity, and ongoing challenges with invasive yellow flag iris. Attention has been focused on this project including invasive weed treatment and inter-planting:

2007: 75 plants
2008: 2,100 plants
2011: 300 plants
2020: 3,100 plants
2023: 2,000 plants

Targeted invasive species treatment was completed in 2024. Additional invasive species treatment is planned for 2025. This project will continue to be monitored for invasive species cover, and plant diversity and density as the project transitions from ash forested wetland to scrub-shrub.

Project 2128: TSWCD – Jackson Creek

This project was planted with 4,000 native shrubs and trees in 2013 and has extensive wetland complexes, significant beaver activity, and ongoing challenges with deer, elk, and beaver browsing. Attention has been focused on this project including invasive weed treatment and inter-planting:

2015: 1,014 plants
2016: 4,800 plants
2017: 1,000 plants
2018: 1,000 plants
2019: 1,000 plants
2024: 1,600 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density. Tree tubes will be used to protect trees from herbivory. In the future, strategic caging of trees along the creek could help establish a tall canopy.

Project 2051: TSWCD - Bledsoe Creek

This project was planted with 29,200 native shrubs and trees in 2010. The project is establishing well as most tree species are over 10 years old. Attention has been focused on this project including invasive weed treatment and inter-planting:

2011: 11,050 plants
2014: 5000 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density.

Project 1422: Beaverton Creek - 153rd to St Mary's

This project was planted with 20,390 native shrubs and trees in 2007 and has extensive wetland complexes and significant beaver activity. Adaptive management efforts are ongoing to address natural changes to the project's plant communities. Attention has been focused on this project including invasive weed treatment and inter-planting:

2008: 12,462 plants
2009: 3,970 plants
2010: 3,000 plants
2011: 14,000 plants
2012: 15,000 plants
2013: 1,743 plants
2014: 5,227 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density.

Project 2137: TSWCD - Gales Creek

This project was planted with 12,000 native shrubs and trees in 2015. Initially, it was difficult for the landowner to keep cattle out of the stream and project area. TSWCD is assisting with fencing and monitoring, and trees and shrubs are establishing. Attention has been focused on this project including invasive weed treatment and inter-planting:

2018: 11,650 plants
2019: 2,132 plants
2020: 2,500 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density.

Appendix D

Identification of Trading Baselines for Flow Enhancement

Appendix D: Identification of Trading Baselines for Flow Enhancement

The following tables present the daily average effluent flow and daily maximum effluent temperature from the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS; daily average Tualatin River flow at the Farmington Bridge (River Mile 33) and at Golf Course Road; and daily average flow enhancement rate from Hagg Lake and Barney Reservoir and the Wapato instream lease rate for July and August 2024. This information is used to calculate the allowable thermal loads, the excess thermal loads discharged, and flow enhancement credit for the Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS.

Table D-1: Trading Baseline for Flow Enhancement for July 2024

Date	Durham WRRF Effluent Flow (MGD)	Durham WRRF Effluent Temperature (C)	Rock Creek WRRF Effluent Flow (MGD)	Rock Creek WRRF Effluent Temperature (C)	Forest Grove NTS Effluent Flow (MGD)	Forest Grove NTS Effluent Temperature (C)	Golf Course Flow (cfs)	Farmington Flow (cfs)	CWS Hagg Release Rate (cfs)	Wapato Instream Lease (cfs)	CWS Barney Release Rate (cfs)
7/1/2024	16.9	21.8	27.18	21.8	2.11	27	141	253	10	5.4	0
7/2/2024	17.6	21.8	26.07	21.7	2.46	26	121	237	10	5.4	0
7/3/2024	16.2	21.8	27.19	21.6	2.17	26	122	222	20	5.4	0
7/4/2024	15.3	22.0	24.64	21.7	1.98	27	136	218	20	5.4	0
7/5/2024	15.5	22.3	23.36	21.8	1.69	29	132	218	20	5.4	0
7/6/2024	15.6	22.4	24.34	21.9	1.70	30	127	210	20	5.4	0
7/7/2024	16.4	22.8	24.67	22.1	1.12	31	128	204	20	5.4	0
7/8/2024	16.4	22.9	25.51	22.3	2.73	30	124	205	20	5.4	0
7/9/2024	16.3	23.0	23.97	22.6	1.23	31	111	198	20	5.4	0
7/10/2024	16.3	23.0	23.52	22.6	3.29	29	129	186	20	5.4	0
7/11/2024	16.0	22.9	25.51	22.6	2.99	27	123	199	20	5.4	0
7/12/2024	15.7	22.9	26.12	22.3	2.97	27	109	194	20	5.4	0
7/13/2024	15.3	23.2	23.89	22.5	1.66	28	112	185	20	5.4	0
7/14/2024	15.7	23.2	24.08	22.7	1.95	29	111	185	20	5.4	0
7/15/2024	16.0	23.1	24.55	22.6	2.53	28	109	187	20	5.4	0
7/16/2024	15.9	23.3	24.48	22.8	2.65	28	112	180	20	5.4	0
7/17/2024	16.2	23.3	23.96	22.9	2.64	28	123	189	20	5.4	0
7/18/2024	15.7	23.3	24.06	22.8	3.45	27	115	194	20	5.4	0
7/19/2024	15.7	23.5	23.86	22.9	2.77	28	109	190	20	5.4	0
7/20/2024	15.3	23.5	23.84	23.1	2.75	28	106	184	20	5.4	0
7/21/2024	16.1	23.0	24.80	22.8	2.80	26	126	184	20	5.4	0
7/22/2024	16.2	23.1	24.31	22.7	2.76	24	122	200	20	5.4	0
7/23/2024	16.1	23.1	24.30	22.6	2.82	24	101	191	20	5.4	0
7/24/2024	16.0	23.2	24.74	22.7	2.93	24	102	177	20	5.4	0
7/25/2024	15.8	23.0	23.41	22.6	2.90	23	107	176	30	5.4	0
7/26/2024	15.3	23.1	23.62	22.8	2.84	24	118	181	40	5.4	0
7/27/2024	15.3	23.0	24.51	22.8	2.79	24	121	188	40	5.4	0
7/28/2024	15.7	22.6	24.13	22.5	2.69	23	133	194	40	5.4	0
7/29/2024	16.8	22.3	25.31	22.3	2.69	21	144	208	40	5.4	14
7/30/2024	16.0	23.0	24.52	22.7	2.85	23	143	219	40	5.4	14
7/31/2024	15.8	23.3	25.51	23.1	2.85	25	123	215	40	5.4	14

Table D-2: Trading Baseline for Flow Enhancement for August 2024

Date	Durham WRRF Effluent Flow (MGD)	Durham WRRF Effluent Temperature (C)	Rock Creek WRRF Effluent Flow (MGD)	Rock Creek WRRF Effluent Temperature (C)	Forest Grove NTS Effluent Flow (MGD)	Forest Grove NTS Effluent Temperature (C)	Golf Course Flow (cfs)	Farmington Flow (cfs)	CWS Hagg Release Rate (cfs)	Wapato Instream Lease (cfs)	CWS Barney Release Rate (cfs)
8/1/2024	15.6	23.6	23.93	23.3	2.89	27	135	203	45	5.4	14
8/2/2024	15.6	23.7	24.35	23.6	2.86	27	140	206	45	5.4	14
8/3/2024	15.3	23.4	24.36	23.2	2.57	26	142	207	45	5.4	14
8/4/2024	15.8	23.6	25.37	23.2	1.86	27	142	208	45	5.4	14
8/5/2024	16.1	23.7	24.80	23.2	1.52	27	131	207	45	5.4	14
8/6/2024	15.6	23.5	25.45	23.1	1.48	26	116	195	40	5.4	14
8/7/2024	16.6	23.4	24.32	23.1	1.73	25	112	184	40	5.4	14
8/8/2024	15.9	23.7	25.50	23.3	1.89	27	124	184	50	5.4	14
8/9/2024	15.7	23.5	23.97	23.2	1.80	25	123	190	50	5.4	14
8/10/2024	15.5	23.9	23.86	23.3	2.05	26	136	189	50	5.4	14
8/11/2024	15.7	23.7	24.80	23.3	2.41	26	147	196	50	5.4	14
8/12/2024	15.6	23.2	23.86	22.8	2.43	22	144	209	50	5.4	14
8/13/2024	15.6	22.8	23.55	22.5	2.57	21	122	202	40	5.4	14
8/14/2024	15.9	23.2	23.70	22.9	2.68	23	119	188	40	5.4	14
8/15/2024	15.9	23.1	23.12	23.0	2.65	23	110	183	40	5.4	14
8/16/2024	15.6	23.4	23.37	23.0	2.66	23	125	180	50	5.4	14
8/17/2024	17.4	23.3	25.80	23.0	2.75	23	133	193	50	5.4	14
8/18/2024	17.2	23.2	25.87	22.7	2.96	23	166	294	50	5.4	14
8/19/2024	16.6	23.2	24.70	22.8	2.85	23	153	283	50	5.4	14
8/20/2024	16.2	23.1	22.90	22.8	2.77	22	117	230	40	5.4	14
8/21/2024	16.2	22.9	25.40	22.9	2.76	21	104	196	40	5.4	14
8/22/2024	16.6	22.8	24.67	22.8	2.86	21	113	186	40	5.4	14
8/23/2024	16.4	22.7	25.59	22.6	2.94	20	122	206	40	5.4	14
8/24/2024	15.8	22.6	25.36	22.4	2.96	19	140	251	40	5.4	14
8/25/2024	16.6	23.0	26.20	22.5	2.98	21	145	237	40	5.4	14
8/26/2024	16.5	23.3	25.20	22.8	2.75	22	127	224	40	5.4	14
8/27/2024	17.0	23.1	23.64	22.8	2.82	22	109	202	40	5.4	14
8/28/2024	15.9	23.0	24.34	22.7	2.77	20	105	185	40	5.4	14
8/29/2024	15.6	23.0	23.54	22.8	2.75	21	112	180	50	5.4	14
8/30/2024	15.2	23.3	22.12	23.2	2.64	22	120	178	50	5.4	14
8/31/2024	15.0	23.5	22.28	23.4	2.62	23	152	187	60	5.4	14

Appendix E

Riparian Codes for Shade-a-Lator

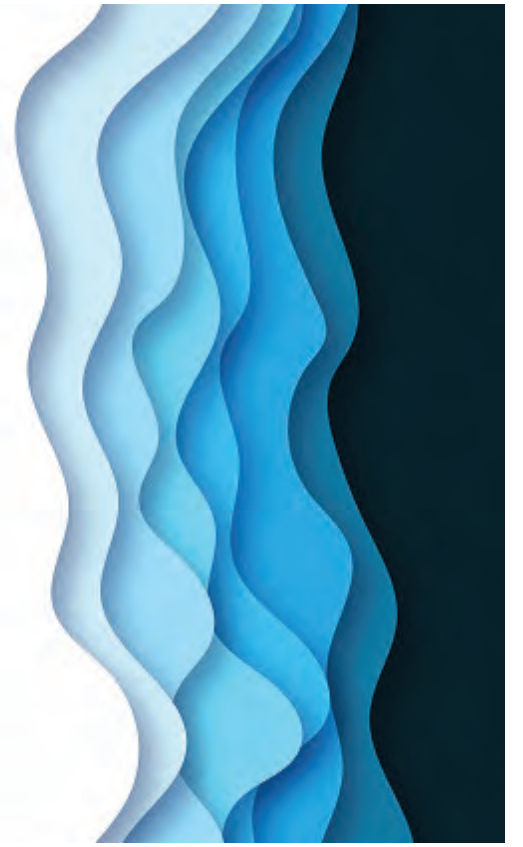
Appendix E: Riparian Codes for Shade-a-Lator

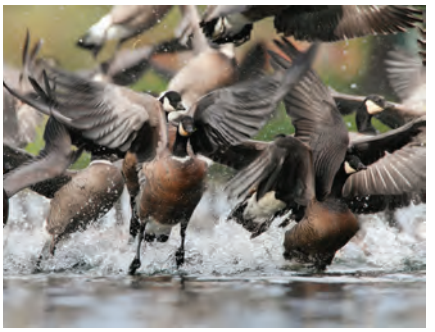
Code	Description	Height (m)	Density (%)	Overhang (m)
1000	Not in project	0.0	0%	0.0
1175	Forest fully vegetated	18.3	75%	3.0
1150	Forest partially vegetated	18.3	50%	3.0
1125	Forest partially vegetated	18.3	25%	3.0
1100	No existing forest vegetation	0.0	0%	0.0
1375	Wetland fully vegetated	6.1	75%	0.6
1350	Wetland partially vegetated	6.1	50%	0.6
1325	Wetland partially vegetated	6.1	25%	0.6
1300	No existing wetland vegetation	0.0	0%	0.0

Source: Clean Water Services

2025 Annual Report

NTS Operations Plan Report





Clean Water Services

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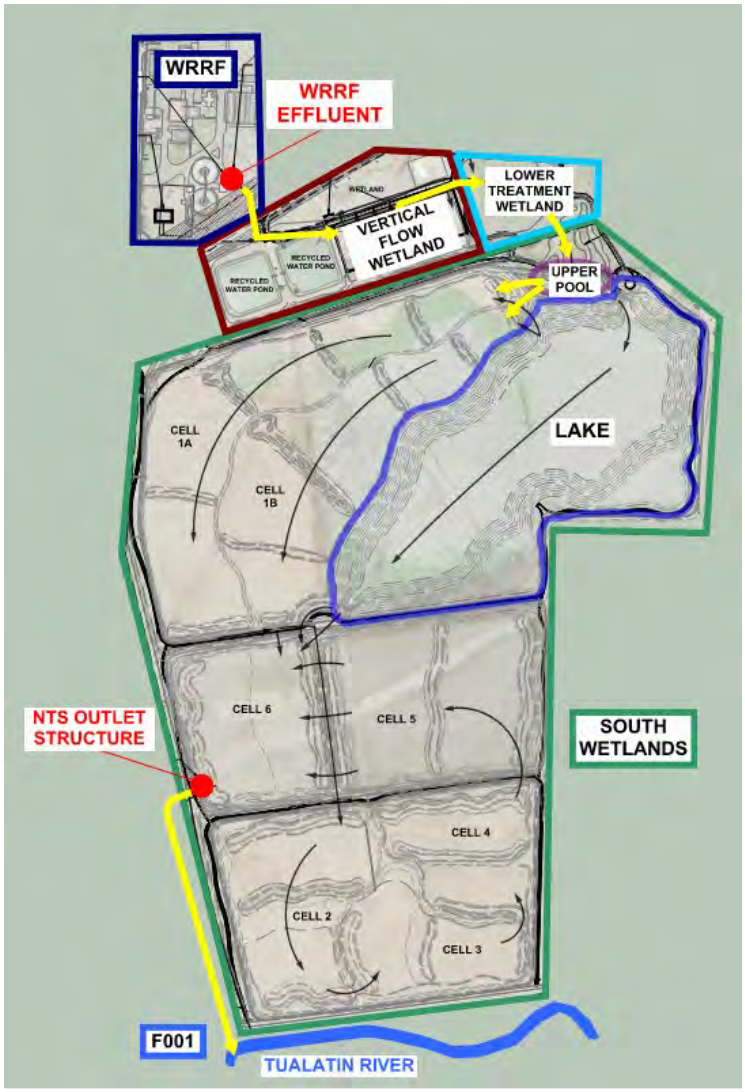
2025 Forest Grove Natural Treatment System Operations Plan

Submitted by March 31, 2025, to fulfill requirements of Schedule D, Condition 12 of the National Pollutant Discharge Elimination System (NPDES) permit.

Background: NTS Flow Path and Controls

The Natural Treatment System (NTS) comprises the Vertical Flow Wetland, Lower Treatment Wetland, and South Wetlands. When the NTS is in use, fully treated and disinfected secondary effluent is discharged from the Clean Water Services (CWS) Forest Grove Water Resource Recovery Facility (WRRF) to the NTS for further polishing. Water is typically sent through the nitrifying Vertical Flow Wetland to the Lower Treatment Wetland and from there to the vegetated South Wetlands, where it flows sequentially through Cells 1 through 6 before being discharged to the Tualatin River through the NTS outlet structure and Outfall F001 (Figure 1).

Figure 1. Forest Grove WRRF and NTS dry season flow path



Downstream of the Vertical Flow Wetland, the NTS contains no pumps, and all flow moves by gravity. Passive flow control structures at the end of each cell allow operators to alter water levels by adding or removing weir boards. Actuated sliding weir gates at the end of Cell 6 can be moved up or down to adjust the size of the aperture and to enable discharge from either the water surface or lower in the water column. Manual sliding weir gates at the ends of Cells 1A, 1B, and 4 enable further management of water levels and flows within the NTS.

When the NTS is in use, treated flows from the WRRF are added to Fernhill Lake to maintain the water level and for storage and aesthetic purposes. Water can leave the lake via a weir box to the influent of Cells 1A and 1B or through an actuated weir gate to the northeast corner of Cell 6. This latter connection draws water from a structure in the southwest corner of the lake and can be used to partially draw down the water level of the lake.

NTS Operations Plan

CWS has developed an Operations Plan to optimize effluent quality at the NTS that includes the following elements:

- Spring startup plan.
- Reintroduction of effluent during the operational period.
- Flow control plan.
- Lake operations.
- Maintenance plan including vegetation management, pest management, and infrastructure maintenance.
- Compliance monitoring.
- Event recognition, prevention, and management.
- Adaptive management.
- End of season and wet season plan.
- Communication and coordination.
- Reporting.

Startup

“Startup” refers to the introduction of flow from the WRRF into the NTS and subsequent discharge from the NTS to the Tualatin River. This includes the annual transition from direct WRRF discharge to NTS operation leading into the dry season. It also refers to the resumption of flow after interruptions due to extended shutoffs during the dry season, such as those that may arise due to construction activities or as needed to maintain compliance. Generally, this relates to periods of three or more consecutive days without flow out of the NTS, which may lead to stagnation or exposure of submerged sediments.

Spring Startup

CWS’ NPDES permit authorizes discharge from the Forest Grove NTS. During the high river flow period, when the Forest Grove WRRF discharges directly to the Tualatin River, the compliance point (F001) is at the Forest Grove WRRF prior to discharge to Outfall F001. During discharge from the NTS, the compliance point (F001) moves to the NTS outfall. During the low

river flow period, if stream flows are greater than or equal to 350 cfs at the Farmington gage and discharge through the NTS is not possible due to hydraulic constraints, the Forest Grove WRRF is permitted to discharge directly to the river at Outfall F001. When discharging directly under these circumstances, the compliance point for all parameters is at the Forest Grove WRRF effluent channel, but the low river flow period limits must be met. When stream flows are below 350 cfs at Farmington, all discharge must go through the NTS, and the compliance point for some parameters shifts to the NTS outlet structure.

Before seasonal startup, CWS will assess the state of infrastructure and conduct maintenance as required. CWS aims to start each operational season with vegetation in an optimal state of health; this entails planting in target areas and promoting plant establishment and growth in the spring before the start of discharge.

The NTS uses plants native to the Tualatin Valley to perform the treatment objectives. Emergent wetland plants native to the Tualatin are genetically adapted to dry summers and wet winters. It is critical for plant health and vigor to provide as natural a hydraulic condition as possible during spring plant emergence. This also helps new or younger plants get established in the NTS. Prolonged inundation before startup will delay the spring plant emergence and will limit plant cover for shading during the long daylight hours of late May through June.

To promote plant emergence and establishment, certain physical conditions must be met. Wetland cells must be dewatered to expose bare substrate for planting new vegetation. If river flows remain high in the spring, the NTS may remain submerged to a depth that precludes installing and establishing new plants. In such cases, mechanical dewatering may be required to ensure that planting can occur during the appropriate window to ensure long-term viability.

CWS will undertake the following actions before initial discharge from the NTS.

- Inspect the Natural Treatment System.
- Conduct pre-discharge maintenance to reduce potential sources of sediment.
  - Clean control structures.
    - Remove sediment from NTS outlet vault and weir boxes at effluent of Cells 1A, 1B, and 4.
  - Clear obstructions and debris resulting from beaver activity.
  - Install coir logs in any channelized areas.
  - Repair potential sources of sediment (e.g., eroded berms).
- Initiate weekly meetings to coordinate on action items and scheduling.
- Dewater wetland cells as needed.
- Conduct annual targeted wetland planting as needed.
- Install aerators.
- Deploy continuous monitoring instruments.
- Determine the startup date for NTS based on the status of maintenance work, monitoring equipment, and seasonal weather and flow patterns.
- Before the release of water into the NTS:
  - Evaluate and adjust weir gate positions between cells to meet startup goals.

Reintroduction of Effluent During Operational Period

Stable operations, rather than frequent starts and stops of flow, are important to optimizing effluent quality in the NTS. While the overarching goal is to achieve continuous flow, it is expected that the NTS may be subject to periodic starts and stops due to operational issues at the Forest Grove WRRF, natural phenomena, and other unanticipated developments.

The Operations Plan aims to optimize effluent quality after effluent flow from the Forest Grove WRRF is reintroduced after an extended period with no flow. When water is reintroduced to the NTS, staff will set and adjust the height of weir gates between cells to minimize the potential for flow surges as water moves into each subsequent cell. The goal of this approach is to reduce resuspension of solids and limit transport of solids to downstream cells thereby optimizing discharge quality.

Flow Control Plan

The aim of the flow control plan is to maintain relatively consistent flows and water levels throughout the vegetated cells to support plant health, minimize short-circuiting of flow, and optimize water quality. Operational strategies will include:

- Maintain consistent flows into and out of the NTS.
  - Maintain an appropriate operating level to:
    - Help avoid drying and rewetting cycles that may increase turbidity, lower dissolved oxygen (DO), and cause nutrient fluctuations.
    - Avoid total stagnation that may contribute to cyanobacterial growth, to the extent feasible.
    - Help ramp flows and minimize local water velocity by using weir gates as necessary to limit resuspension of sediment, especially near the outfall.
    - Decrease residence times to promote diatoms and green algae.
  - Evaluate options for determining optimum dry season flows through the NTS.
  - Monitor flow via the effluent flow meter at the NTS outlet structure.
- Identify and minimizing preferential flow paths.
  - During the winter drawdown, conduct annual monitoring using drones to identify any preferential flow paths that may contribute to short-circuiting of flow.
  - Place coir logs or other established wetland flow control tools to minimize preferential flow paths.
- Use weir gates at the end of Cells 1A, 1B, 4, and 6 to control flow and water levels in segments of the NTS.
  - Adjust aperture to moderate impacts of flow fluctuations and minimize swings in water level to limit shear and resuspension of sediment.
  - Adjust operating depth of the NTS on a cell-by-cell basis to potentially increase chlorophyll and algal growth if supported by monitoring data.

Alternate flow paths within the NTS may be used for short periods to enable maintenance or restoration during the dry weather season. This may involve isolating or bypassing parts of the regular flow path to enable access while minimizing the impact of sediment disturbances or other water quality concerns on the wider treatment system. Examples of reasons for using an alternate flow path include repairing damage caused by wildlife, vandalism, or equipment failure,

improving effluent water quality, calibrating or repairing instrumentation, or conducting selective revegetation. Any use of alternate flow paths is intended to be of short duration and will be noted along with the reason in operational logs.

Lake Operation

The large open-water expanse of Fernhill Lake provides habitat and a large volume of water storage. Prior monitoring in the lake has identified water quality concerns such as high pH and populations of cyanobacteria that may arise in summer months. The goal of lake operation is to maintain water quality and aesthetics and to avoid detrimental impacts to the treatment system. Strategies will include:

- Reduce lake level before the start of dry season operations. The decrease in level will expose perimeter mud flats and minimize shallow stagnant zones that are conducive to the growth of cyanobacteria.
  - When feasible, route water through Cells 1A and 1B (rather than directly to Cell 6) to maximize treatment.
- Isolate the lake from the NTS flow path in summer as necessary, based on current conditions; add fully treated secondary effluent to the lake as needed.
- Monitor pH and other water quality parameters to guide lake water quality management.
- Evaluate technology options for maintaining and improving water quality; the lake may be incorporated into the NTS flow path with improved water quality.

Maintenance Plan

Vegetation Management

Emergent vegetation in the wetland cells provides shade and transpiration to cool effluent before discharge. Maintaining a target level of vegetative cover is required for optimal cooling. Annual flooding, animal feeding or burrowing, and other natural phenomena can contribute to vegetation loss. Regular upkeep is required to maintain and reestablish plant cover throughout the NTS. Steps for vegetation management will include:

- Regularly evaluate vegetation health and shade cover.
  - Walk the perimeter weekly during the dry season to note plant health and cover.
  - Conduct annual drone flights to generate shade maps for historical comparison.
- Revegetate as needed in response to monitoring, with a target of maintaining 80% cover in the vegetated cells (ongoing). Maintain an emphasis on incorporating native vegetation. In addition to developing and maintaining shade cover in wetland cells, plant shrubs and trees on adjacent upland slopes to increase shading.
- Manage nuisance invasive plant species such as reed canary grass.
- Conduct site maintenance and response to minimize preferential flow paths that may contribute to localized loss of vegetation (ongoing).
- Mimic the natural hydroperiod before annual startup and at the beginning and end of the dry season by adjusting water levels and flow.
- Minimize over-inundation and allow for plant establishment and recovery. Partly or fully drain NTS vegetated cells via gravity or mechanical dewatering as needed in spring

before starting NTS operations. This exposes bare substrate, enabling planting and seeding and promoting the establishment of young vegetation before the start of flow.
- Send flows through the NTS during the high flow period in spring and autumn as needed to support plant health

Pest Management

Pest species such as carp and nutria feed extensively on plant roots to a degree that is unsustainable and damaging to the ecosystem. This activity contributes to expanding the open water with minimal shade and may increase sediment suspension. Carp burrow into sediments to lay eggs, which increases turbidity levels. Additionally, burrowing by nutria can lead to berm erosion. Pest management aims to decrease the number of pest species present in the NTS and limit the damage resulting from them. Due to the location of the NTS within the floodplain, it is impossible to permanently eradicate problem species; fish are reintroduced from the river via annual flooding and excluding nutria is functionally impossible. Ongoing management is required and will include strategies such as:

- Minimize open water areas where carp tend to thrive, primarily in spring, to reduce carp populations.
- Consult fisheries experts on management techniques.
- Identify and incorporate native wetland plants that are less vulnerable to animal damage.
- Control nutria populations.
    - Annual contract with Animal and Plant Health Inspection Service (through U.S. Department of Agriculture) to assist with nutria management.

Physical Assets Assessment and Earthwork

The NTS physical infrastructure includes a system of berms and weirs that can be adjusted to control flow into and out of cells. Earthwork, weirs, weir boxes/lids, and weir gates need to be regularly monitored and maintained to allow for desired flows and treatment. Measures will include:

- Conduct routine inspections during the operating season.
    - Identify and implement opportunities for repair and maintenance.
- Conduct ongoing maintenance to reduce potential sources of sediment.
- Clean NTS outlet vault at least monthly during the low river flow season.
- Conduct pre- and post-dry season surveys using fall drone flights and seasonal walk-throughs to identify areas to target for repair and maintenance:
    - Preferential flow paths.
    - Bare substrate scoured during winter flooding.
    - Zones with extensive nutria and pest damage.
- Respond to emergent conditions during dry season operations:
    - Place temporary flow barriers (e.g., coir logs, rocks, sod mats, logs, or wooden post weirs) to prevent short-circuiting.
    - Regular checks and manual clearing of debris from weir boxes.
- Perform offseason maintenance:
    - Restore damaged berms. Where appropriate, block nutria burrows and stabilize the toe of the slope with barriers (e.g., rocks or chain-link fencing) to prevent further damage.

- Conduct more permanent earthwork to correct or reverse preferential flow paths and minimize short-circuiting.

Compliance Monitoring Plan and Target Effluent Concentrations

The startup, flow control, and maintenance plans described above are geared at optimizing the quality of the effluent discharged from the NTS. CWS will implement these measures and monitor to verify that water quality targets and limits are being met and to assess the effectiveness of different strategies. Monitoring will include parameters in Table 1.

During dry season conditions when the NTS is in use, F001 represents the monitoring location at the NTS outlet structure. The Forest Grove WRRF serves as an internal monitoring point (F004) to characterize the initial quality of the water being released to the NTS. If the composite sampler at the NTS outlet fails, manual grab samples may be composited under certain circumstances; refer to Table B8 note e and Internal Memo "24-hour composite sample procedure at Forest Grove NTS" (July 2023) for procedures.

Table 1. NTS Effluent Monitoring (Outfall F001)

Parameter	Limits	Monitoring Frequency	Sample Type
$CBOD_5$	10 mg/L (monthly median) [a] 15 mg/L (weekly median) [a]	3/week	24-hour composite
TSS	10 mg/L (monthly median) [a] 20 mg/L (weekly median) [a]	3/week	24-hour composite
Dissolved Oxygen	6.0 mg/L or greater as a daily average	Daily	Continuous
pH	6.3 to 9 SU	2/week	Grab
Thermal Shock Thermal Load [b]	85 million kcal/day (May) 68 million kcal/day (June) 93 million kcal/day (July) 76 million kcal/day (August) 60 million kcal/day (September) 69 million kcal/day (October)	N/A	Calculation
Excess Thermal Load [c]	7 million kcal/day (offset with water quality trading program)	N/A	Calculation
Total Phosphorus	81.6 lb/d – monthly median TP mass load from R001 (monthly median limit) 66.1 lb-d – monthly median TP mass load from R001 (seasonal median limit) (Applies May 1 – September 30)	2/week	24-hour composite
Ammonia (as N) for DO	Bubbled Tier 1 and Tier 2	3/week	24-hour composite

Notes:

[a] Per note (i) in Table A1 of the 2022 NPDES Permit:

i. The operation of the NTS can be impacted by extreme unpredictable natural and physical events that are determined by DEQ to impact the ability for the NTS to properly meet limits (e.g., declared droughts, smoke from forest fires, flash flooding, etc.). Such events are expected to be rare, infrequent and of limited duration, and can affect the ability of the NTS to meet the CBOD5 and TSS monthly and weekly median concentration limits. During such an event, the permittee must ensure that the following requirements are met:

i. The permittee must notify DEQ of the event as soon as practicable, but no later than three business days, after receiving any single F001 discharge sample result exceeding the weekly median values for CBOD5 or TSS. The notice must include a description of the abnormal event suspected of causing the elevated CBOD5 or TSS discharge concentration; the estimated duration of the abnormal event if it is ongoing; and any steps that the permittee is taking to reduce CBOD5 or TSS discharge concentrations in response to the abnormal event.

ii. Monitoring of the Forest Grove WRRF effluent at internal monitoring location (Outfall F004) meets the CBOD5 and TSS concentration targets in Table A1-1 below:

Table A1-1 Target Concentrations for CBOD5 and TSS at Forest Grove WRRF Effluent

Parameter	Monthly Average	Weekly Average
CBOD5	15 mg/L	25 mg/L
TSS	20 mg/L	30 mg/L

iii. Monitoring of the effluent from the Forest Grove NTS outlet structure F001 meets the following effluent limits in Table A1-2 below:

Table A1-2 Effluent Limits for CBOD5 and TSS at NTS Outlet Structure

Parameter	Monthly Average	Weekly Average
CBOD5	25 mg/L	40 mg/L
TSS	30 mg/L	45 mg/L

iv. Report exceedance of monthly or weekly median concentration limit for CBOD5 and TSS in discharge monitoring reports as required by Schedule B for the duration of exceedance. For each discharge monitoring report, the permittee shall include a statement describing any abnormal event that the permittee believes caused the exceedances, the estimated duration of the abnormal event if it is ongoing, the reasons the permittee believes that the exceedances were caused by the abnormal event, the measures that the permittee undertook to implement the NTS Operations Plan in response to the abnormal event, any steps that the permittee is taking to reduce CBOD5 or TSS discharge concentrations in response to the abnormal event and any adaptive management actions that the permittee will take in anticipation of similar future events.

v. Provided that the permittee was operating the NTS per the NTS Operations Plan required by Condition D.12 of this permit at the time of the event, complied with the target concentrations in Table A1-1 and prepared the required documentation and reporting of the event, the limits in Table A1-2 will apply for the duration of the event.

j. For all NTS start-up periods, the following limits apply to any calendar week for seven days after start-up, provided the permittee has implemented the NTS Operations Plan required by Schedule D.12 of this permit and complies with the internal Outfall F004 CBOD5 and TSS concentration targets in Table A1-1:"

Table A1-3 Weekly Effluent Limits for CBOD5 and TSS for NTS Start-Ups

Parameter	Weekly Average
$CBOD_5$	40 mg/L
TSS	45 mg/L

[b] Based on thermal plume requirements; temperature not to exceed 32 C

[c] Based on Tualatin sub-basin Temperature TMDL wasteload allocations

In addition to the parameters in Table 1, CWS will conduct monitoring for NH_3-N, TKN, nitrates, metals, copper Biotic Ligand Model parameters, aluminum parameters, and toxics, as well as Whole Effluent Toxicity testing, per permit requirements.

Table 2. TSS Action Levels

Number of Samples	Probability	Concentration	Action Levels
Single Sample	0.005	30 mg/L	Threshold indicating that levels of TSS are potentially elevated above permit limits and actions are needed to respond to elevated TSS

Applied Monitoring Program

CWS will also conduct monitoring within the NTS to support the optimization of operations. The applied monitoring will be updated annually and as needed to support operations. This monitoring will be carried out as needed and may include:

- Continuous temperature monitoring to evaluate the thermal impact of vegetation changes.
- Turbidity profiles to analyze whether flow strategies lead to reduced sediment suspension; select TSS monitoring to provide correlations to support the turbidity profiles.
- Longitudinal nutrient profiles and/or algal sampling.

Abnormal Conditions: Event Recognition, Prevention, Management

An abnormal event is any condition that results in or appears to be leading toward conditions that increase any regulated water quality parameters. Over the past year, abnormal conditions have caused elevated levels of TSS. Abnormal events are defined in comment (i) of Table A1. An event may be identified through routine monitoring or maintenance activities including walk-throughs, data review, planned or unplanned maintenance, or severe weather alerts. For example, construction at the Forest Grove facility may cause termination of flow to the NTS, resulting in a substantial change to the flow pattern. Events may result in decreasing inflow to or outflow from the NTS, using alternate flow paths, or terminating flow and subsequent restart. Once initiated, event management will include initiating the communication plan, increased monitoring as needed and implementing the applicable components of an adaptive management action.

Adaptive Management Actions

CWS has identified short-term and longer-term adaptive management actions to optimize water quality and promote stable operations. Many of the strategies presented in this document include adaptive management elements.

Longer-term actions include targeted revegetation, berm restoration, and major projects such as infrastructure improvements that are planned and reviewed seasonally. Shorter-term adaptive management includes day-to-day responses such as removing debris and installing temporary flow barriers to limit short-circuiting and altering temporary flow paths within the NTS as described in the Flow Control Plan.

Short-term adaptive management actions are focused on optimizing temperature, dissolved oxygen, and TSS levels to meet permit limits for those parameters. Because of the five-day turnaround time for the CBOD test, short-term adaptive management actions are focused on optimizing TSS levels in the effluent, which will also be effective in optimizing CBOD levels. For all events, CWS will initially inspect and evaluate the NTS to determine the likely cause of the abnormal operating conditions. CWS may increase the monitoring of parameters. The following actions will be taken to meet DO, temperature, and TSS targets at the NTS outlet structure:

Dissolved Oxygen

- Ensure proper operation of aerators in the outlet structure.
- Control flow into NTS outlet structure to ensure that aerators can maintain target DO.
- Adjust the aperture of weir gates leading into the NTS outlet structure to ensure aeration steps are available and not inundated during periods when DO is naturally lower in the wetland.
- Close outlet gate as necessary to ensure that DO target is met.

Temperature

- Evaluate using the outlet weir gate to draw water from below the surface to ensure that the warmest water is not being discharged.
- Adjust discharge flow to meet thermal load limits specified in the table above.
- Close outlet gate as necessary to ensure temperature and thermal load limits are met.

TSS

CWS will monitor NTS effluent TSS levels. If a significant increase in TSS is observed, staff will:

- Attempt to isolate the cause and initiate maintenance or repairs.
- Temporarily divert flow, if feasible and appropriate.
- Adjust water levels and flows during and after event response to minimize sediment suspension.
- Terminate discharge from the NTS if necessary.

If discharge from the NTS is projected to be interrupted for an extended duration, Forest Grove WRRF effluent flow may be redirected away from the NTS to prevent the NTS from flooding. The need to divert Forest Grove WRRF flow would depend on multiple factors including NTS water depth, Forest Grove WRRF effluent flow rate, and the cause and expected duration of interrupted discharge from the NTS. If flow is diverted from the NTS, Forest Grove WRRF effluent flow will be directed to the Rock Creek WRRF until flows to the NTS resume.

In the event of a prolonged cessation of NTS discharge, CWS will follow the steps enumerated under the “Reintroduction of Effluent During Operational Period” section upon resuming flow into and out of the NTS.

Reporting Abnormal Events Outside of Reasonable Control

In the case of an abnormal event beyond CWS' reasonable control, CWS will notify DEQ as soon as practicable, but no later than three business days after receiving any sample exceeding the weekly median value of 15 mg/L of $CBOD_5$ or 20 mg/L of TSS. The notice must include a description of the abnormal event suspected of causing the elevated $CBOD_5$ or TSS discharge concentration; the estimated duration of the abnormal event if it is ongoing; and any steps that the permittee is taking to reduce $CBOD_5$ or TSS discharge concentrations in response to the abnormal event.

Plan for End of Season and Wet Season

At the end of the dry season, the Forest Grove WRRF may discharge directly to the Tualatin River without sending flow through the NTS. In the past, the operation of the NTS at high flows during the winter and early spring has disrupted vegetative growth; high flows can dislodge seedlings and topsoil and inhibit effective rooting. Future strategies will aim to avoid wet season NTS operations that may damage vegetation. However, the NTS may still be used for some periods outside the permit-defined dry weather season, such as to assist plant establishment in spring or if there is a prolonged dry period due to a delay in fall rains. When the NTS is offline during the wet season, CWS staff will evaluate the status of the NTS infrastructure and vegetation and carry out restoration work.

CWS will take the following actions:

- **Fall:** Stop sending flow into the NTS at the end of the dry season as needed to allow water levels to be drawn down before the start of regular winter rains. This will allow for fall-season restoration planting and late-season growth and rooting of macrophytes, giving them a better chance of survival during the annual winter inundation. Additional fall activities will include:
  - Keep weir gates open within and at the outlet structure of the NTS to allow water drainage and minimize sediment deposition near gates.
  - Identify and schedule repairs and revegetation.
  - Begin earthwork restoration.
  - Review status of major projects.
  - Conduct annual NTS operations and performance reviews and update the Operations Plan as needed.
- **Winter:** Minimize the use of the NTS to the extent feasible. If the NTS is used, limit wet season flows to a maximum of 6 MGD to avoid stressing dormant vegetation.
- **Spring:** Avoid discharging flow through the NTS from mid-March through late April to allow the NTS to naturally dewater and plants to propagate. Spring activities will include:
  - Conduct annual targeted wetland planting in March and April of each year.
  - Carry out invasive plant management.
  - Decrease water level in Fernhill Lake and dewater vegetated cells in NTS.
  - Install monitoring equipment at the NTS outlet in mid- to late April.
  - Coordinate debris management and clean-out of control structures before May 1.

Communication and Coordination

- Weekly coordination meetings will begin April 1 of each year and will continue through the dry season. Members of Forest Grove WRRF management, the Wetland Manager, and Operations Analysts will meet to discuss items including:
  - Prepare for initial NTS startup: vegetation, dewatering, pest management, Fernhill Lake dewatering, NTS filling schedule.
  - Construction coordination.
  - Flow status/flow management.
  - Data review.
  - WRRF process changes.
  - NTS maintenance needs and status of projects.
  - Event management.
  - Compliance status.
- The Forest Grove WRRF Superintendent, Operations Analyst, and Wetland Manager will communicate regularly regarding process or flow changes, operational incidents, maintenance activities, and other topics that require immediate attention.

Reporting

- Monthly data and operational notes included in monthly DMRs.
- By March 1 of each year, review the previous year's NTS Operations Plan, maintenance, and operational activities to determine if updates or revisions are needed. An updated NTS Operations Plan must be submitted to DEQ by March 31.
- If changes to the Operations Plan are deemed necessary, document revisions before the start of dry season operations.