

RECYCLED WATER DISTRIBUTION PROJECT JOHN DAY, OREGON

Preliminary Engineering Report

WPCF Permit No. 103281

AUGUST 2023



EXPIRES: JUN. 30, 2025

Prepared By:



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HECO Project No. JD 23-0343

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Prepared for:

**City of John Day
450 East Main Street
John Day, OR 97845**

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1. Design Introduction and Background

In accordance with the Oregon Department of Environmental (ODEQ) Quality Rules and Internal Management Directive – “Implementing Oregon’s Recycled Water Use Rules, June 2009,” (IMD), Section 5.2, an engineering report should be prepared for all new recycled water systems and follow the general guidelines for wastewater treatment systems predesign reports (ODEQ 1994). This Preliminary Engineering Report (PER) presents and describes the basis for the proposed recycled water distribution (purple pipe) system design as part of the wastewater system improvements described in the City’s 2019 Wastewater Facilities Plan Update dated March 12, 2019, by Anderson Perry & Associated, Inc. and the 2022 Wastewater System Improvements Preliminary Engineering Report Addendum 1 dated March 7, 2022 (2022 Report) by Flagline Engineering and Kennedy Jenks.

The City of John Day plans to construct a new wastewater treatment facility (WWTF)/(Water Reclamation Facility) (WRF) that will collect and treat municipal wastewater from the City’s sewer service area. The WRF will produce Class A recycled water and make it available for a variety of users that currently divert freshwater from the John Day River basin for non-potable uses in Grant County, Oregon. A purple pipe distribution system, including an above storage tank and pump station to be co-located with the WRF, is planned for delivering Class A recycled water to end users for industrial and agricultural uses.

John Day owns and operates the public wastewater collection and treatment facilities that serve both John Day and the neighboring community of Canyon City. The current WWTF is a mechanical treatment facility originally constructed in 1949 that consists of an influent lift station, headworks, two primary clarifiers, two trickling filters, one secondary clarifier, chlorine disinfection, two-stage high-rate anaerobic sludge digester, four sludge drying beds, and four infiltration ponds adjacent to the John Day River. The WWTF treats over approximately 80 million gallons of wastewater annually. This water is stored after treatment in four percolation ponds and is eventually discharged indirectly into the John Day River and watershed.

Once the new WRF is constructed the City is permitted to discharge treated effluent to rapid infiltration basins or utilize treated effluent for beneficial purposes as recycled water under Oregon DEQ Water Pollution Control Facilities (WPCF) Permit (Permit Number 103281), effective date May 1, 2022. A copy of the WPCF permit is provided in Appendix B. In accordance with the City’s WPCF permit, the City of John Day is authorized to operate and maintain a domestic wastewater treatment facility consisting of a sequencing batch reactor (SBR) with tertiary filters and ultraviolet light disinfection with an average dry weather flow of 0.3 MGD. Treated effluent will be discharged to rapid infiltration basins (Outfall 001) or utilized for beneficial purpose as recycled water (Outfall 002) in accordance with a DEQ approved Recycled Water Use Plan (RWUP).

The 2022 Report identified four treatment alternatives with associated common improvements. These included: Alternative No. 1 – Membrane Bioreactor, Alternative No. 2 – Sequencing Batch Reactor (SBR), Alternative No. 3 – Aero-Mod, and Alternative No. 4 – Oxidation Ditch. The City selected treatment Alternative No. 2. The treatment project includes a new SBR treatment facility with two separate SBR treatment trains including an equalization basin, aerobic digester, and sludge storage tank, tertiary filters, ultraviolet disinfection system, and related improvements to produce treated effluent for discharge to Outfall 001 and Class A recycled water for beneficial use at Outfall 002, the City’s purple pipe system.

This Preliminary Engineering Report is for the purple pipe distribution system improvements, storage tank, pump station, and related improvements. The purple pipe project is a separate project from the WRF project but will utilize the treated Class A recycled water produced by the WRF for beneficial purposes. The City has secured funding for the design and construction of the purple pipe project through Oregon Water Resources Department (OWRD).

2. Intended Beneficial Uses

There are several beneficial uses approved under Oregon Administrative Rules (OAR) 340-055 for Class A recycled water. This project will create a recycled water storage tank, pump station, and purple pipe distribution network to promote the beneficial use of Class A recycled water for permitted uses. The use of recycled water is permitted subject to the conditions listed in the City’s WPCF Permit. Refer to Table 1 below for a summary of the beneficial purposes. Additional discussion of the recycled water beneficial uses can be found in the RWUP. Refer to Appendix F for the approved Recycled Water Beneficial Purposes Table.

Table 1 – Summary of Beneficial Purposes			
Beneficial Purpose	Class of Water	Quantity	Application Frequency
Permitted Class A recycled water beneficial uses	Class A	Approx. 80 MG/year	Recycled water to City facilities and other end users per user agreements

The intended Class A recycled water beneficial uses have been identified and are outlined below:

- Landscape irrigation supply for areas open to public including City parks such as Hill Park and 7th St. Park Complex, and the City’s recreation facilities along the John Day River Multi Use Trail,
- Irrigation supply and landscape impoundments supply for John Day Golf Course,
- Industrial process and log spray water at Malheur Lumber mill,
- Bulk water fill station for permitted beneficial purposes,
- Permitted beneficial uses at the Innovative Gateway facilities such as the City’s hydroponics greenhouses, future business park and proposed hotel/event center,
- Irrigation permitted beneficial uses,
- Industrial, commercial, and construction permitted beneficial uses, and
- Landscape and recreational impoundments permitted beneficial uses.

Refer to Figure 1 in Appendix A for the project anticipated end user locations.

3. Treatment System Reliability Features

Treatment system reliability features will be evaluated and specified as part of the WRF design. The treatment system will include all necessary reliability features required to ensure only Class A recycled water meeting the WPCF Permit limits is pumped into the Class A recycled water storage tank for use at permitted Outfall 002. All other treated effluent shall be discharged to permitted Outfall 001. The WRF will include all equipment along with monitoring and control systems necessary for treatment system reliability. These will include necessary automated diversions and alarms. The treatment system is anticipated to have online turbidimeters and ultraviolet light (UV) disinfection intensity and transmittance meters to verify Class A treatment prior to pumping to the recycled water storage tank.

Recycled waters disinfected by UV radiation have propensity for bacteria regrowth, which can be a significant issue in transmission and distribution lines. Facilities that disinfect by UV radiation and move water through long transmission lines or require storage prior to reuse, may need to utilize chlorine and maintain a chlorine residual to control biofilm development. Biofilm control with UV disinfected waters should be evaluated as part of the WRF design, with provisions to add chlorination as part of the WRF project. A submersible tank mixer is proposed in the new 500,000-gallon recycled water storage tank. This will help to minimize or prevent thermal stratification, stagnation, and short-circuiting within the tank.

4. Contingencies to Prevent Inadequately Treated Recycled Water Delivery

The WRF will include control measures and monitoring equipment to prevent inadequately treated recycled water from being delivered to the water users. These will include necessary automated diversions and alarms. Online turbidimeters and UV disinfection intensity and transmittance meters will be included in the treatment system to verify Class A treatment prior to entry into the recycled water storage tank. Only recycled water meeting Class A level of treatment standards will be released into the storage tank for subsequent pumping and distribution to end users through the purple pipe network.

Conditions that require an immediate stop of diversion of recycled water into the recycled water storage tank (Outfall 002) include any of the following:

1. Measured turbidity before disinfection exceeds 2 NTUs,
2. Total coliform after disinfection exceeds a median of 2.2 organisms per 100 mL based on daily sampling over the last 7 days that analyses have been completed,
3. Total coliform after disinfection exceeds 23 organisms per 100 mL in any single sample,
4. Alarm condition or operator observation in SBR treatment process indicating inadequate oxidation,
5. Alarm condition or operator observation in tertiary filters indicating inadequate filtration, or
6. Alarm condition or operator observation in UV disinfection system indicating inadequate disinfection.

The above conditions will require treated effluent discharge to the rapid infiltration basins (Outfall 001) in accordance with WPCF Permit requirements. The WRF will have operating procedures, monitoring instrumentation, alarms, and controls to prevent inadequately treated recycled water from being released into the 500,000-gallon storage tank.

Conditions that require an immediate stop of pumping from the recycled water storage tank to the purple pipe distribution network include the following:

1. Inadequately treated recycled water not meeting Class A level of treatment standards entering the 500,000-gallon recycled water storage tank.

The above condition(s) will require turning the recycled water pump station off and draining the 500,000-gallon storage tank either to the rapid infiltration basins (Outfall 001) if the water meets the treated of the WPCF Permit effluent limits for Outfall 001, or to the WRF headworks for treatment through the treatment facility. The tank will be drained slowly to the sewer collection system or a designated location at the RWF.

5. Supplemental Water Supplies

The new WRF will replace the existing WWTF that discharges treated effluent into percolation ponds next to the John Day River. The WRF will produce Class A recycled water that will be used for permitted beneficial purposes. The high-quality recycled water will be used in lieu of existing freshwater use at the properties and locations served by the recycled water distribution system, which will be managed in accordance with the DEQ-approved RWUP. Per the City's OWRD Grant Application, the goal of the WRF project is to achieve one hundred percent (100%) water conservation within the project area. The project will conserve up to 80 million gallons of freshwater annually by replacing the existing freshwater uses with recycled water.

Existing properties and users that already have a supply of water for their irrigation or industrial water demands are anticipated to use this Class A recycled water as a supplemental source of water, while some sites or users may use this water as their primary source. Since the recycled water supply capacity is limited to the influent flow rate of wastewater to the WRF, recycled water demands may exceed supply at times. It is anticipated that a water use schedule may be necessary during high demand periods to prevent depletion of stored water. The City will manage recycled water use based on WRF recycled water production and water levels in the storage tank. The City's use agreements with recycled water users are anticipated to cover limitations and restrictions.

The City has a cross connection control ordinance and program to comply with the Oregon Administrative Rules (OARs) for public water systems pertaining to cross-connection control requirements. See Appendix E for information on the City's cross connection control program.

6. Transmission and Distribution System

The recycled water distribution (purple pipe) system will begin at the storage tank and recycled water pump station located adjacent to the new WRF site. The purple pipe network will generally follow the route shown in Figure 1 in Appendix A. The pipe and related components will be identified by a purple color and labelled in accordance with the IMD section 5.6.2 Transmission and Distribution System Requirements.

It is anticipated the project will consist of approximately 13,000 linear feet of 8-inch and 6-inch purple pipe mains with 4-inch laterals in accordance with OAR 340-055-0030(5) and IMD guidelines. Distribution pipe will be fusible High-Density Polyethylene (HDPE) conforming to PE4710 recycled water pipe, DIPS Pressure Class 100 psi (DR 21) with materials classification ASTM D 3350.

Tables 2 summarizes the design criteria for the recycled water distribution system. Refer to Appendix C for example product information for the distribution system, including pressure pipe, valves, and service meters.

Table 2 – Distribution System Design Criteria	
Design Parameter	Design Criteria for Project
Pipe: HDPE Pressure Pipe, fused joints	4-inch nominal (4.315-average I.D.) HDPE D.I.P.S. Pipe, 100 psi DR 21 Pressure Class with materials classification PE4710 per ASTM D 3350.
	6-inch nominal (6.203-average I.D.) HDPE D.I.P.S. Pipe, 100 psi DR 21 Pressure Class with materials classification PE4710 per ASTM D 3350.
	8-inch nominal (8.136-average I.D.) HDPE D.I.P.S. Pipe, 100 psi DR 21 Pressure Class with materials classification PE4710 per ASTM D 3350.
Isolation Valves	AWWA resilient wedge gate valves.
Air/Vacuum Valves	Wastewater combination air valves, installed at high point connections to allow air release from or admitted into new water main.
Water Services	Per City of John Day standard meter configuration: Badger meters for reclaimed water, ORION cellular AMR, 3-ft service line depth, and 24-inch register depth.
OAR 340-055-0030(5) and IMD Guideline Requirements	Will design and construct in accordance with the OAR requirements.

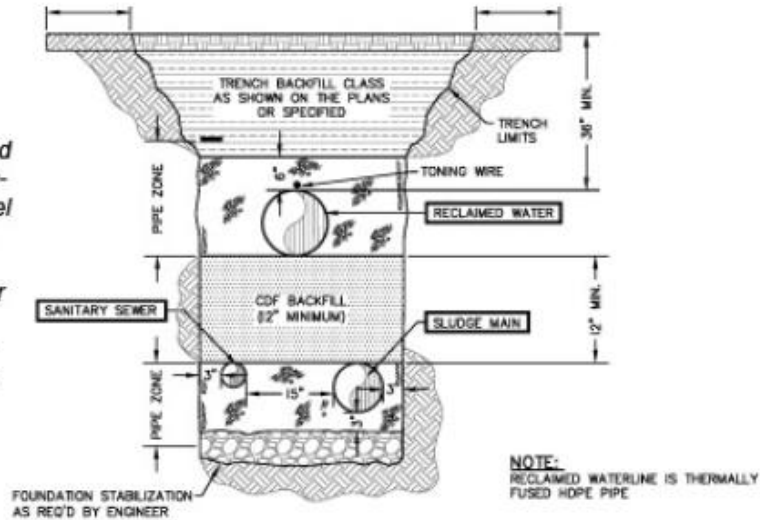
As shown in Figure 1 in Appendix A, the purple pipe network will extend east-west along U.S. Highway 26/395 for approximately 1.1 miles, beginning to the east of Patterson Bridge Rd. and extending west to the entrance of Malheur Lumber mill. A lateral will extend to the south through an easement to the John Day Golf Course. From the new WRF, a portion of the pipeline will turn east and follow the existing John Day River multi-use trail, approximately 10-ft outside the north edge of pavement. It will connect to the existing purple pipe network at a 6” tee on 7th Street near the pedestrian bridge to Hill Park.

Utilities will be verified during design and alignment adjustments may be necessary. For construction of the purple pipe system, a 10-foot horizontal separation and a 1-foot vertical separation will be maintained between both parallel potable water mains and sanitary sewer mains. In locations where the minimum separation distances cannot be achieved, the recycled water pipe will be constructed per the following Figure 1 below. All purple pipe distribution improvements are anticipated to be on City property or within City right-of-way (ROW), ODOT ROW, or permanent easements.

Each end user connection will be metered and monitored. These meters will measure the volumes of recycled water distributed and used in the system. Data will be sent to the City's utility department through the cellular AMR system. The purple pipe distribution system service lines and meters will be constructed in accordance with the City of John Day Public Works Standards using the City's standard meter type and configuration.

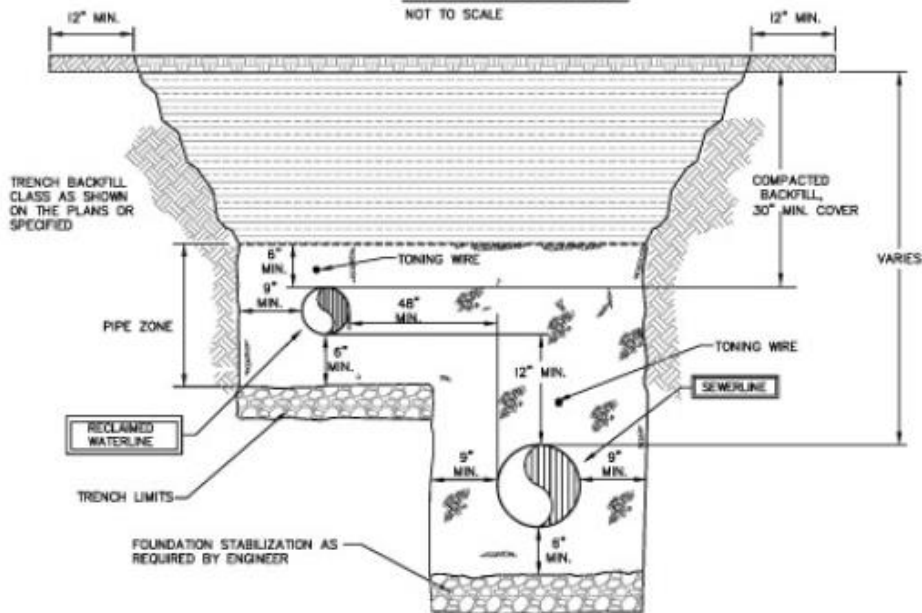
The piping system will be designed with sufficient valving to provide the necessary controls and operator flexibility. Combination air/vacuum valves will be installed at critical points to allow air to be released from or admitted into the main. In addition, pipe locating wire and marking tape will be installed for the buried pipe installation per Oregon Standard Specifications for Construction (OSSC). The distribution system will be constructed in accordance with applicable requirements of the OSSC, Recommended Standards for Wastewater Facilities (Ten States Standards), and City of John Day Standards.

- NOTES**
- 1) Maintain minimum 10' vertical and 1' horizontal separation between parallel potable water pipe and sanitary sewer/recycled water pipes
 - 2) Recycled water pipe must be fused (jointless) HDPE.



STACKED SECTION

NOT TO SCALE



TERRACED SECTION

NOT TO SCALE

Figure 7. DEQ-approved special construction designs for recycled water systems.

Figure 1 DEQ Approved Special Construction Trench Detail

7. Storage Tank

The project includes a recycled water storage tank to be located near the northwest corner of the new WRF as shown in Figure 1 in Appendix A. It will be constructed above the 100-year floodplain. The nominal capacity of the storage tank will be approximately 500,000 gallons. This storage capacity will store 1.67 days of the 0.3 mgd permitted average dry weather flow listed on the WPCF Permit. The tank will store nearly 1.8 days of flow, based on the 20-year design average annual WRF treatment flow rate of 0.282 mgd presented in the 2022 Report. At startup, it will store nearly two days of design annual average flow of Class A recycled water production from the WRF, based on the initial design average annual WRF treatment flow rate of 0.260 mgd listed in the 2022 Report.

The City will manage recycled water use based on available recycled water production from the WRF and water levels in the storage tank. It is anticipated that a water use schedule may be necessary during high demand periods to prevent depletion of stored water.

The tank will be a glass fused, bolted steel reservoir, similar to the City’s most recently constructed water reservoirs. It will be constructed in conformance to applicable requirements of OAR 333-061-0050 and AWWA Standards D100 and D103. A submersible tank mixer is proposed inside the tank to help minimize or prevent thermal stratification, stagnation, and short-circuiting within the tank. Table 3 summarizes the design criteria for the recycled water storage tank. Refer to Appendix C for example storage tank and tank mixer product information.

Table 3 – Storage Tank Design Criteria	
Design Parameter	Design Criteria for Project
Tank Type	Glass-fused bolted steel storage tank
Nominal Storage Capacity	500,000-gallons
Diameter	52-feet approx.
Height	32-feet approx.
Roof	Self-supported Aluminum dome or Glass-Fused-to-Steel deck
Shell	Glass Fused to Steel
Floor	Glass Fused to Steel Floor
Foundation	Ring wall foundation

8. Pump Station

The recycled water pump station will pump water directly from the Class A recycled water storage tank to the purple pipe system. A packaged irrigation pumping station is planned, which will be housed in an insulated and heated enclosure adjacent to the storage tank. The pump station will include three (3) recycled water pumps, each capable of pumping 180 gpm of which one (1) will be a redundant pump. The pump station will be equipped with variable frequency drives (VFDs), control panel, pressure sensor, and flow meter. The pumps will be operated to maintain a consistent pressure in the recycled water distribution system as measured at the pump station discharge pipe.

Each pump has a capacity of 180 gpm. With two pumps running, the pump station will pump approximately 360 gpm at 162 feet total dynamic head (TDH), which is equivalent to about 70 psi outlet pressure. 360 gpm will cover the WRF max month wet weather 20-year design flow rate of 0.507 mgd presented in the 2022 Report. During low flow demands, one pump will meet system demands up to 180 gpm. Demands in the range of 180 to 360 gpm will require two pumps running. The pump controls and VFDs will adjust pumps automatically based on recycled water demands, pressure settings, and tank levels. The lead, lag, and lag-lag pumps will be alternated through the control panel to balance run hours. Pump station flows will be measured with an electromagnetic flow meter at the pump station.

The pump station design parameters are summarized in Table 4. Refer to Appendix C for example pump station product information. Refer to Appendix D for pump calculations and hydraulic model results.

Table 4 – Pump Station Design Criteria	
Design Parameter	Design Criteria for Project
Pump Type	End-Suction Centrifugal
Pump Quantity	3
Overall Design Flow	360 gpm at 70 psi discharge pressure
Pump Design Flow (each)	180 gpm at 162 ft Total Dynamic Head (TDH)
Pump HP (each)	15.0 HP
Voltage	480V
Phase	3
Hertz	60
Motor Design	Premium Efficiency
Motor Starting/Controls	VFD – all motors
Pressure Control Type	Pressure transducer system
Flow Meter	Mag meter
Pump Station Enclosure	Marine grade aluminum with insulation & heater to prevent freezing

The pump station will be connected to the on-site standby generator serving the WRF. The generator and automatic transfer switch (ATS) are not part of the current recycled water distribution project but will be included in the RWF project. In the event of a power outage, the generator will automatically start and begin powering the pump station. The pump station controls and alarms will notify the WRF operator of pump station alarms 24-hours per day. The City's on duty or on call operator will respond to alarm conditions 24-hours per day.

The probability of an overflow at the storage tank and pump station is very low since the pump station is piped directly from the storage tank and includes pumping redundancy and alarms to resolve critical problems at the pump station. Also, on-site standby power with automatic transfer will increase the reliability of the triplex pump station and the ability to quickly detect and react to any problems. In the unlikely event of an overflow at the tank/pump station site, the overflow would occur at the storage tank overflow pipe, which will be contained and routed to the WRF headworks for treatment. There is no potential for human or household pet contact on the site. The John Day River is located 800 feet south of the pump station. Downstream piping will be as shown on the plans and has been sized for the design flows of the pump station.

Construction engineering and construction observation services will be performed by HECO Engineers on behalf of the City of John Day. Project engineering services also include preparation of an operation and maintenance (O&M) manual for the pump station by HECO Engineers. The Contractor will provide manufacturer O&M manuals for the pump station that will become part of the final O&M manual prepared by the Engineer. The final O&M manual, approved by DEQ, shall be submitted to the City of John Day prior to startup of the pump station. The City of John Day will review and approve the recycled water distribution system, storage tank, pump station plans and specifications prior to final design submittal, bidding, and construction.

9. Electrical

The project will include the required electrical service to the recycled water pump station to power the pumps, flow meter, pressure and level instrumentation, tank mixer, and pump station enclosure. 480 volt, 3 phase service is recommended. Available service to the site will be confirmed and coordinated with the electrical utility during design.

10. Geotechnical

A geotechnical evaluation of the tank and pump station site is in progress. The findings and recommendations will be presented in a geotechnical report, which will be included in the final design and construction contract documents. The geotechnical report will be consulted during design of the tank and pump station.

11. Project Implementation

The project implementation schedule will be coordinated with the John Day City Manager, City Public Works, funding agency, and the project grant administrator and environmental review consultant. This coordination is an important step that will allow the project tasks and milestones to be completed within the funding agency project deadlines. Table 5 lists the anticipated project schedule, which represents a typical timeline for a project of this size and scope. Construction is currently scheduled to begin in April 2024, with project completion late 2024 or early 2025. Actual times can be significantly longer or occasionally shorter. Dates depend on DEQ approval dates and City scheduling decisions.

Table 5 – Project Schedule		
Task	Time Range	Approximate Date Range
Preliminary and Final Design, including DEQ and OWRD Approvals	6-8 months	June 2023 to February 2024
Bid and Award Project	1-2 months	February 2024 to March 2024
Construct Project	8-12 months	April 2024 to April 2025

12. Appendices

Appendix A – Project Maps

Appendix B – WPCF Permit

Appendix C – Example Product Data

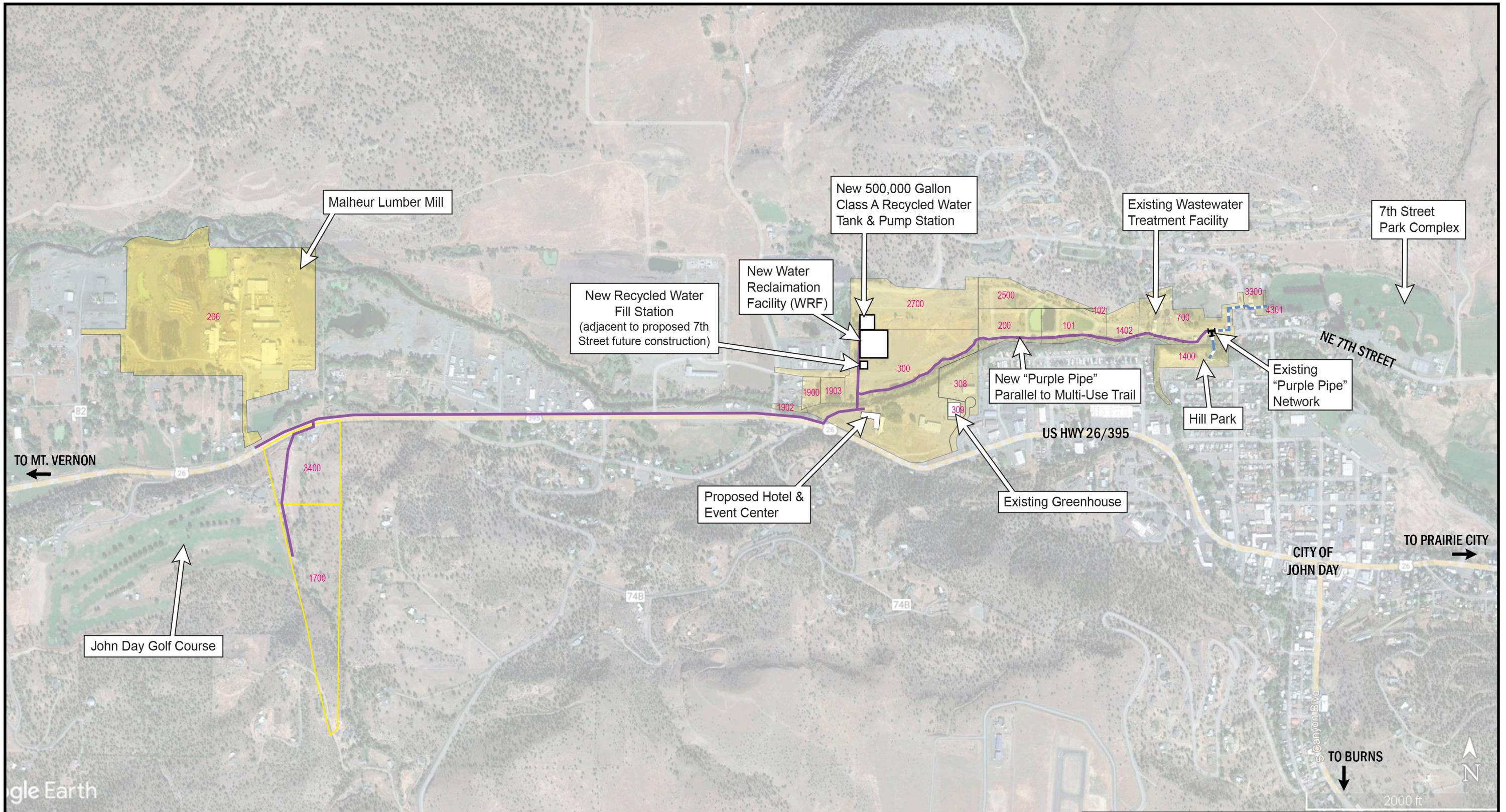
Appendix D – Calculations

Appendix E – Cross-Connection Control Ordinance

Appendix F – Recycled Water Beneficial Purposes Table

APPENDIX A

PROJECT MAPS



LEGEND:

- City Property
- New "Purple Pipe" Class A Recycled Water Distribution System
- Existing "Purple Pipe"
- Tax Parcel Boundary



City of John Day
Recycled Water Distribution Project
Schematic Layout

APPENDIX B

WPCF PERMIT



WATER POLLUTION CONTROL FACILITIES PERMIT

Oregon Department of Environmental Quality

Eastern Region – Pendleton Office

800 SE Emigrant, #330

Pendleton, OR 97801

Telephone: 541-276-4063

Issued pursuant to ORS 468B.050

ISSUED TO:	SOURCES COVERED BY THIS PERMIT:		
City of John Day 450 East Main St. John Day, OR 97845	Type of Waste	Outfall Number	Location
	Domestic Wastewater	001	Lat: 44.42221 Long: -118.97070
	Recycled Water	002	Specified in Recycled Water Use Plan
	Biosolids	003	Specified in Biosolids Management Plan

FACILITY TYPE AND LOCATION:

Sequencing batch reactor with ultraviolet disinfection
 700 NW 7th Ave
 John Day, OR 97845
 County: Grant

RIVER BASIN INFORMATION:

WRD Basin: John Day

 USGS Sub-Basin: 170702010902 Upper John Day
 Nearest surface water body name: John Day River
 LLID: 1206499457318
 John Day at RM 248.0

File: 43569 permit 102481 referenced.

Issued in response to Application No. 948631 received December 7, 2021. This permit is issued based on the land use findings in the permit record.

Shannon Davis

Shannon Davis, Acting Water Quality
 Manager
 Eastern Region

4-18-2022

Issuance Date

5-1-2022

Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify or operate a wastewater collection, treatment, control and disposal system in conformance with the requirements, limits, and conditions set forth in this permit.

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon statute or administrative rule, any direct or indirect discharge of pollutants to waters of the state is prohibited.

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SCHEDULE A: WASTE DISCHARGE LIMITS

1. Permitted System

The City of John Day is authorized to operate and maintain a domestic wastewater treatment facility consisting of a sequencing batch reactor with tertiary filters and ultraviolet light disinfection with an average dry weather flow of 0.3 MGD. Treated effluent will be discharged to rapid infiltration basins or utilized for beneficial purpose as recycled water in accordance with a DEQ approved Recycled Water Use Plan (RWUP).

2. Effluent Limits for Outfall 001

During the term of this permit, the permittee must comply with the effluent limits in Table A1 for discharge into the rapid infiltration basins. Monitoring point must be located after the UV treatment but just prior to discharge to the rapid infiltration basins.

Table A1: Outfall 001 Limits

Parameter	Units	Monthly Average	Weekly Average	Single sample Maximum
BOD ₅	mg/L	20	35	--
TSS	mg/L	20	35	--
Total nitrogen	mg/L	5	--	9
<i>E. coli</i>	organisms/100ml	126 (geometric mean)	--	406 ^a
pH	SU	Instantaneous limit between a daily minimum of 6.5 and a daily maximum of 8.5		

Note:

- a. No single *E. coli* sample may exceed 406 organisms per 100 mL; however, DEQ will not cite a violation of this limit if the permittee takes at least 5 consecutive re-samples at 4 hour intervals beginning within 28 hours after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100mL.

3. Surface Water Protection

Direct discharge to navigable waters as defined in OAR Chapter 340 Division 045 Section 0010 (13) is prohibited.

4. Groundwater Protection

Any activity that has an adverse effect on existing or potential beneficial uses of groundwater is prohibited. All wastewater and wastewater solids must be managed and disposed in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR Chapter 340, Division 40). If warranted, at any time, DEQ may evaluate the need for or require a full assessment of the facility's effect on groundwater quality.

The permittee must conduct routine groundwater monitoring as specified in the facility's DEQ approved Groundwater Monitoring Plan.

5. Use of Recycled Water

The permittee is authorized in OAR Chapter 340 Division 055 Section 0012 to distribute recycled water if it is:

- a. Treated and used according to the criteria listed in Table A2.
- b. Managed in accordance with its DEQ-approved Recycled Water Use Plan unless exempt as provided in Schedule D.
- c. Used in a manner and applied at a rate that does not adversely affect groundwater quality.
- d. Applied at a rate and in accordance with site management practices that ensure continued agricultural, horticultural, or silvicultural production and does not reduce the productivity of the site.
- e. Irrigated using sound irrigation practices to prevent:
 - i. Offsite surface runoff or subsurface drainage through drainage tile;
 - ii. Creation of odors, fly and mosquito breeding, or other nuisance conditions; and
 - iii. Overloading of land with nutrients, organics, or other pollutants.

Table A2: Recycled Water Limits

Class	Level of Treatment (after disinfection unless otherwise specified)	Beneficial Uses
A.	Class A recycled water must be oxidized, filtered and disinfected. Before disinfection turbidity may not exceed: <ul style="list-style-type: none"> • An average of 2 NTUs within a 24-hour period. • 5 NTUs more than five percent of the time within a 24-hour period. • 10 NTUs at any time. After disinfection, total coliform may not exceed: <ul style="list-style-type: none"> • A median of 2.2 organisms per 100 mL based on daily sampling over the last 7 days that analyses have been completed. • 23 organisms per 100 mL in any single sample. 	Class A recycled water approved uses: <ul style="list-style-type: none"> • Class B, Class C, Class D, and nondisinfected uses. • Irrigation for any agricultural or horticultural use. • Landscape irrigation of parks, playgrounds, school yards, residential landscapes, or other landscapes accessible to the public. • Commercial car washing or fountains when the water is not intended for human consumption. • Water supply source for non-restricted recreational impoundments.
B.	Class B recycled water must be oxidized and disinfected. Total coliform may not exceed: <ul style="list-style-type: none"> • A median of 2.2 organisms per 100 mL, based on the last 7 days that analyses have been completed. • 23 total coliform organisms per 100 mL in any single sample. 	Class B recycled water approved uses: <ul style="list-style-type: none"> • Class C, Class D, and nondisinfected uses. • Stand-alone fire suppression systems in commercial and residential building, non-residential toilet or urinal flushing, or floor drain trap priming. • Water supply source for restricted recreational impoundments.

6. Agronomic rates for Nutrient Loading

Crop and site specific agronomic loading rates for nutrients will be approved by DEQ only after consideration of agronomic rates published in appropriate, region specific, fertilizer guides and proposed by the Permittee. DEQ may require adjustment to the allowable agronomic rates after review of annual reporting and to ensure adequate protection of public waters, including groundwater. The Recycled Water Use Plan must list the approved agronomic rates for each proposed crop

7. Biosolids

The permittee may land apply biosolids or provide biosolids for sale or distribution, subject to OAR 340; Division 50 and 40 CFR Part 503, and the following conditions:

- a. The permittee must manage biosolids in accordance with its DEQ-approved Biosolids Management Plan and Land Application Plan.
- b. The permittee must apply biosolids at or below the agronomic rates approved by DEQ in order to minimize potential groundwater degradation. DEQ may require adjustment to the allowable agronomic rate after review of annual reporting and to ensure adequate protection of public waters, including groundwater.
- c. The permittee must obtain written site authorization from DEQ for each land application site prior to land application (see Schedule D) and follow the site-specific management conditions in the DEQ-issued site authorization letter.
- d. Prior to application, the permittee must ensure that biosolids meet one of the pathogen reduction standards under 40 CFR 503.32 and one of the vector attraction reduction standards under 40 CFR 503.33.
- e. The permittee must not apply biosolids containing pollutants in excess of the ceiling concentrations shown in the table below. The permittee may apply biosolids containing pollutants in excess of the pollutant concentrations, but below the ceiling concentrations, however, the total quantity of pollutant applied cannot exceed the cumulative pollutant loading rates in the table below.

Table A3: Biosolids Limits

Pollutant See note a.	Ceiling concentrations (mg/kg)	Pollutant concentrations (mg/kg)	Cumulative pollutant loading rates (kg/ha)
Arsenic	75	41	41
Cadmium	85	39	39
Copper	4300	1500	1500
Lead	840	300	300
Mercury	57	17	17
Molybdenum	75	N/A	N/A
Nickel	420	420	420
Selenium	100	100	100
Zinc	7500	2800	2800

Note:

- a. Biosolids pollutant limits are described in 40 CFR 503.13, which uses the terms *ceiling concentrations*, *pollutant concentrations*, and *cumulative pollutant loading rates*.

SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

1. Reporting Requirements

The permittee must submit to DEQ monitoring results and reports as listed below.

Table B1: Reporting Requirements and Due Dates

Reporting Requirement	Frequency	Due Date (See Note a.)	Report Form (See Note b.)	Submit To: (See Note c & d)
Tables B2 and B3 Influent Monitoring and Effluent Monitoring	Monthly	By the 15th of the following month	Specified in Schedule B. Section 2 of this permit	As directed by DEQ
Groundwater Monitoring Plan	One Time	12 months after permit effective date	Electronic copy in a DEQ- approved format	As directed by DEQ
Groundwater Monitoring	Quarterly	By the 15 th of the following month after quarter end (See Note e).	Electronic copy in the DEQ- approved form	As directed by DEQ
Surface Water Monitoring Plan	One Time	12 months after permit effective date	Electronic copy in a DEQ- approved format	As directed by DEQ
Surface water monitoring	Quarterly	By the 15 th of the following month after quarter end (See Note e).	Electronic copy in the DEQ- approved form	As directed by DEQ
Recycled Water Annual Report (see Schedule D)	Annually	January 15	Electronic copy in the DEQ- approved format	As directed by DEQ Electronic copy to DEQ Water Reuse Program Coordinator
Biosolids annual report (See Schedule D)	Annually	February 19	Electronic copy in the DEQ- approved form	As directed by DEQ DEQ Biosolids Program Coordinator
Inflow and infiltration report (see Schedule D)	Annually	February 15	Electronic copy in a DEQ- approved format	As directed by DEQ
Industrial User Survey (see Schedule D)	One Time	January 15, 2024	Electronic copy in a DEQ- approved format	As directed by DEQ Electronic copy to DEQ Pretreatment Program Coordinator
Hauled Waste Control Plan (see Schedule D)	One time	Submit prior to accepting hauled waste	Electronic copy in a DEQ- approved format	As directed by DEQ

Reporting Requirement	Frequency	Due Date (See Note a.)	Report Form (See Note b.)	Submit To: (See Note c & d)
Hauled Waste Annual Report (see Schedule D)	Annually	January 15	Electronic copy in the DEQ-approved format	As directed by DEQ
Notes: a. For submittals that are provided to DEQ by mail, the postmarked date must not be later than the due date. b. All reporting requirements are to be submitted in a DEQ approved format, unless otherwise specified in writing. c. Electronic reporting information is provided on DEQ’s web page (https://www.oregon.gov/deq/wq/wqpermits/Pages/NPDES-E-Reporting.aspx). d. Email address for biosolids and recycled water coordinator are provided on DEQ’s biosolids web page (https://www.oregon.gov/deq/wq/programs/Pages/Biosolids.aspx). e. Monitoring requirements will not begin until after DEQ approves the city’s plan				

2. Monitoring and Reporting Protocols

a. Paper Submissions.

When submitting paper copies as required by table B1, the permittee must submit to DEQ the results of the monitoring in a paper format as specified below.

- i. Until directed by DEQ all Discharge Monitoring Reports (DMRs) must be submitted in an approved paper format:
 - (A) The reporting period is the calendar month.
 - (B) The permittee must submit monitoring data and other information required by this permit for all compliance points by the 15th day of the month following the reporting period unless specified otherwise in this permit or as specified in writing by DEQ.
- ii. Until directed by DEQ, the permittee must submit any required Pretreatment Program Reports, Wastewater Solids and Biosolids Annual Report, Recycled Water Annual Report, Sanitary Sewer Overflow/Bypass Event Reports, and other required information to DEQ.
- iii. The permittee must sign and certify submittals of Discharge Monitoring Reports (DMRs), reports, and other information in accordance with the requirements of Section D8 within Schedule F of this permit.

b. Electronic Submissions.

When submitting electronic copies as required by table B1, the permittee must submit to DEQ the results of monitoring in an electronic format as specified below.

- i. When directed by DEQ, the permittee must submit monitoring results required by this permit via DEQ-approved web-based Electronic Discharge Monitoring Report (DMR) forms.
- ii. The reporting period is the calendar month.
- iii. The permittee must submit monitoring data and other information required by this permit for all compliance points by the 15th day of the month following the reporting period unless specified otherwise in this permit or as specified in writing by DEQ.
- iv. When directed by DEQ, the permittee must submit electronic reports for any required Pretreatment Program Reports, Wastewater Solids and Biosolids Annual Report, Recycled Water Annual Report, Sewer Overflow/Bypass Event Reports, and other required information to DEQ via designated web-based reporting process.

c. **Test Methods.**

The permittee must conduct monitoring according to test procedures in 40 CFR part 136 and 40 CFR part 503 for biosolids or other approved procedures as per Schedule F.

d. **Detection and Quantitation Limits**

- i. Detection Level (DL) – The DL is defined as the minimum measured concentration of a substance that can be distinguished from method blank results with 99% confidence. The DL is derived using the procedure in 40 CFR part 136 Appendix B and evaluated for reasonableness relative to method blank concentrations to ensure results reported above the DL are not a result of routine background contamination. The DL is also known as the Method Detection Limit (MDL) or Limit of Detection (LOD).
- ii. Quantitation Limits (QLs) – The QL is the minimum level, concentration or quantity of a target analyte that can be reported with a specified degree of confidence. It is the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration for the analyte. It is normally equivalent to the concentration of the lowest calibration standard adjusted for sample weights, volumes, preparation and cleanup procedures employed. The QL as reported by a laboratory is also sometimes referred to as the Method Reporting Limit (MRL) or Limit of Quantitation (LOQ).
- iii. For compliance and characterization purposes, the maximum acceptable QL is stated in this permit.

e. **Implementation**

The Laboratory QLs (adjusted for any dilutions) for analyses performed to demonstrate compliance with permit limits or as part of effluent characterization, must be at or below the QLs specified in the permit unless one of the conditions below is met.

- i. The monitoring result shows a detect above the laboratory reported QL.
- ii. The monitoring result indicates non-detect at a DL which is less than the QL.
- iii. Matrix effects are present that prevent the attainment of QLs and these matrix effects are demonstrated according to procedures described in EPA's "Solutions to Analytical Chemistry Problems with Clean Water Act Methods", March 2007. If using alternative methods and taking appropriate steps to eliminate matrix effects does not eliminate the matrix problems, DEQ may authorize in writing re-sampling or allow a higher QL to be reported. In the case of effluent characterization monitoring,

f. **Quality Assurance and Quality Control**

- i. Quality Assurance Plan – The permittee must develop and implement a written Quality Assurance Plan that details the facility sampling procedures. This plan should include any equipment calibration and maintenance, analytical methods, quality control activities and laboratory data handling and reporting if the permittee conducts any of their own analytical work. The QA/QC program must conform to the requirements of 40 CFR 136.7.
- ii. If QA/QC requirements are not met for any analysis, the permittee must re-analyze the sample. If the sample cannot be re-analyzed, the permittee must re-sample and analyze at the earliest opportunity. If the permittee is unable to collect a sample that meets QA/QC requirements, then the permittee must include the result in the discharge monitoring report (DMR) along with a notation (data qualifier). In addition, the permittee must explain how the sample does not meet QA/QC requirements. The permittee may not use the result that failed the QA/QC requirements in any calculation required by the permit unless authorized in writing by DEQ.

- iii. Flow measurement, field measurement, and continuous monitoring devices - The permittee must:
 - (A) Establish verification and calibration frequency for each device or instrument in the quality assurance plan that conforms to the frequencies recommended by the manufacturer.
 - (B) Verify at least once per year that flow-monitoring devices are functioning properly according to manufacturer's recommendation. Calibrate as needed according to manufacturer's recommendations.
 - (C) Verify at least weekly that the continuous monitoring instruments are functioning properly according to manufacturer's recommendation unless the permittee demonstrates a longer period is sufficient and such longer period is approved by DEQ in writing.

g. **Reporting Sample Results**

- i. The permittee must report the same number of significant digits as the permit limit for a given parameter.

3. Monitoring and Reporting Requirements

- a. The permittee must monitor influent at the headworks to the treatment plant and report results in accordance with the table below:

Table B2: Influent Monitoring Requirements

Item or Parameter	Units	Time Period	Minimum Frequency	Sample Type / Required Action See note b.	Report Statistic See note a.
Flow (50050)	MGD	Year-round	Daily	Metered	Monthly Average Daily Maximum
BOD ₅ (00310)	mg/L	Year-round	Once per Week	24 Hour Composite ^c	Monthly Average
TSS (00530)	mg/L	Year-round	Once per Week	24 Hour Composite ^c	Monthly Average
pH (00400)	Standard Units SU	Year-round	Once per Week	Grab	Monthly Maximum Monthly Minimum
Hauled Waste	Gallons	Year-round	Daily	Amount Received	Monthly Total

Notes:

- a. When submitting DMRs electronically, all data used to determine summary statistics shall be submitted in a DEQ approved format unless otherwise directed by DEQ. If submitting paper DMRs, all data collected shall be reported on each DMR.
- b. In the event of equipment failure or loss, the permittee must notify DEQ and repair or replace effected equipment to minimize interruption of data collection. If the equipment cannot be immediately repaired or replaced, the permittee must perform grab measurements daily
- c. Composite samples shall consist of no less than 6 samples collected over a 24-hour period and apportioned according to the volume of flow at the time of sampling.

- b. The permittee must monitor effluent at Outfall 001 prior to discharge to infiltration basins and report results in accordance with Table B1 and the table below:

Table B3: Effluent Monitoring Requirements

Item or Parameter	Units	Time Period	Minimum Frequency	Sample Type/ Required Action See note b.	Report Statistic See note a.
Flow (50050)	MGD	Year-round	Daily	Metered	Monthly Average Daily Maximum
Temperature (00010)	°C	Year-round	Daily	Metered	Monthly Average Daily Maximum
BOD ₅ (00310)	mg/L	Year-round	Once per Week	24-hour composite ^c	Monthly Average Weekly Average
TSS (00530)	mg/L	Year-round	Once per Week	24-hour composite ^c	Monthly Average Weekly Average
pH (00400)	Standard Units (SU)	Year-round	Once per Week	Grab	Daily Maximum Daily Minimum
E. coli (51040)	#/100 mL	Year-round	Once per Week	Grab	Daily Maximum Monthly Median
UV intensity (49607)	mW/cm ²	Year-round	Daily	Continuous	Daily Minimum
UV dose (61938)	(mJ/cm ²)	Year-round	Daily	Calculation	Daily Minimum
UV transmittance (51043)	%	Year-round	Daily	Continuous	Daily Minimum
Total Kjeldahl Nitrogen (TKN) (00625)	mg/L	Year-round	Quarterly	Grab	Quarterly Maximum
Nitrate (NO ₃) Plus Nitrite (NO ₂) Nitrogen (00630)	mg/L	Year-round	Quarterly	Grab	Quarterly Maximum
Total Ammonia (as N) (00610)	mg/L	Year-round	Quarterly	Grab	Quarterly Maximum
Total Nitrogen (00600)	mg/L	Year-round	Monthly	Calculated	Monthly
Total Phosphorus (00665)	mg/L	Year round	Monthly	Grab	Monthly
Total Dissolved Solids (70295)	mg/L	Year-round	Quarterly	Grab	Quarterly Maximum

Item or Parameter	Units	Time Period	Minimum Frequency	Sample Type/ Required Action See note b.	Report Statistic See note a.
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Notes:

- a. When submitting DMRs electronically, all data used to determine summary statistics shall be submitted in a DEQ approved format as an attachment unless otherwise directed by DEQ. If submitting paper DMRs, all data collected shall be reported on each DMR.
- b. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, the permittee must perform grab measurements. If the failure or loss is for continuous temperature monitoring equipment, the permittee must perform grab measurements daily between 2 PM and 4 PM until continuous monitoring equipment is redeployed.
- c. Composite samples shall consist of no less than 6 samples collected over a 24-hour period and apportioned according to the volume of flow at the time of sampling.

4. Recycled Water Monitoring Requirements: Outfall 002

The permittee must monitor recycled water for Outfall 002 as listed below only when distributing recycled water. The samples must be representative of the recycled water delivered for beneficial reuse at each location identified in the Recycled Water Use Plan.

Table B4: Recycled Water Monitoring

Item or Parameter	Minimum Frequency	Sample Type/ Required Action	Report
Total Flow (MGD)	Daily	Measurement	Annual Report and monthly
Quantity Irrigated (inches/acre)	Daily	Calculation	Annual Report and monthly per field
pH	2/Week	Grab	Annual Report and monthly
Total Coliform	Daily	Grab	Annual Report and monthly
Turbidity (Class A)	Hourly	Measurement	Annual Report and monthly
Total Nitrogen Loading Rate (lbs/acre-year)	Annually	Calculation	Annual Report
Supplemental Fertilizer Applied	As applied	Record Amounts	Annual Report
Nutrients (TKN, NO2+NO3-N, Total Ammonia (as N), Total Phosphorus)	Quarterly	Grab	Annual Report and monthly

5. Biosolids Monitoring Requirements

The permittee must monitor biosolids land applied or produced for sale or distribution as listed below. The samples must be representative of the quality and quantity of biosolids generated and undergo the same treatment process used to prepare the biosolids.

Table B5: Biosolids Monitoring

Item or Parameter	Minimum Frequency	Sample Type
Nutrient and conventional parameters (% dry weight unless otherwise specified): Total Kjeldahl Nitrogen (TKN) Nitrate-Nitrogen (NO ₃ -N) Total Ammoniacal Nitrogen (NH-N) Total Phosphorus (P) Potassium (K) pH (S.U.) Total Solids Volatile Solids	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B6.	As described in the DEQ-approved Biosolids Management Plan
Pollutants: As, Cd, Cu, Hg, Pb, Mo, Ni, Se, Zn, mg/kg dry weight	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B6	As described in the DEQ-approved Biosolids Management Plan
Pathogen reduction	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B6.	As described in the DEQ-approved Biosolids Management Plan
Vector attraction reduction	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B6.	As described in the DEQ-approved Biosolids Management Plan
Record of biosolids land application: date, quantity, location.	Each event	Record the date, quantity, and location of biosolids land applied on site location map or equivalent electronic system, such as GIS.

Table B6: Biosolids Minimum Monitoring Frequency

Quantity of biosolids land applied or produced for sale or distribution per calendar year		Minimum Sampling Frequency
(dry metric tons)	(dry U.S. tons)	
Less than 290	Less than 320	Once per year
290 to 1,500	320 to 1,653	Once per quarter (4x/year)
1500 to 15,000	1,653 to 16,535	Once per 60 days (6x/year)
15,000 or more	16,535 or more	Once per month (12x/year)

6. Groundwater Monitoring Requirements

The permittee must monitor groundwater as listed below. The samples must be representative of the groundwater flowing through the aquifer at the time of sample collection. The samples will be collected at the monitoring well(s) as identified in the Groundwater Monitoring Plan.

Table B7: Groundwater Monitoring

Item or Parameter	Minimum Frequency	Sample Type/ Required Action	Report
Dissolved Oxygen	Quarterly	Measurement	Annual Report
Oxidation Reduction Potential	Quarterly	Measurement	Annual Report
pH	Quarterly	Measurement	Annual Report
Turbidity	Quarterly	Measurement	Annual Report
Temperature	Quarterly	Measurement	Annual Report
Total Suspended Solids	Quarterly	Grab	Annual Report
BOD ₅	Quarterly	Grab	Annual Report
Total Dissolved Solids	Quarterly	Grab	Annual Report
Total Nitrogen	Quarterly	Grab	Annual Report
<i>E. coli</i>	Quarterly	Grab	Annual Report
Total Phosphorus	Quarterly	Grab	Annual Report

7. Surface Water Monitoring Requirements

The permittee must monitor surface water of the John Day River as listed below. The samples must be representative of the water flowing in the John Day River at the designated locations. Samples will be collected from the upstream site and downstream site for each sampling event. These samples will be collected at the locations identified in the Surface Water Monitoring Plan. The permittee may request a reduction or termination of this sampling effort after collection of three full years of data if the data clearly shows no evidence of discharge of pollutants from the facility to surface water.

Table B8: Surface Water Monitoring

Item or Parameter	Minimum Frequency	Sample Type/ Required Action	Report
Total Flow (MGD)	Quarterly	Measurement	Annual Report
Dissolved Oxygen	Quarterly	Measurement	Annual Report
pH	Quarterly	Measurement	Annual Report
Temperature	Quarterly	Measurement	Annual Report
<i>E. coli</i>	Quarterly	Grab	Annual Report
Total Nitrogen	Quarterly	Grab	Annual Report
BOD ₅	Quarterly	Grab	Annual Report

SCHEDULE C: COMPLIANCE SCHEDULE

This permit has no compliance schedule.

SCHEDULE D: SPECIAL CONDITIONS

1. Inflow and Infiltration

The permittee must submit to DEQ an annual inflow and infiltration report on a DEQ approved form as directed in Table B1. The report must include the following:

- a. An assessment of the facility's I/I issues based on a comparison of summer and winter flows to the plant.
- b. Details of activities performed in the previous year to identify and reduce inflow and infiltration.
- c. Details of activities planned for the following year to identify and reduce inflow and infiltration.
- d. A summary of sanitary sewer overflows that occurred during the previous year. This should include the following: date of the SSO, location, estimated volume, cause, follow-up actions and if performed, the results of receiving stream monitoring.

2. Emergency Response and Public Notification Plan

The permittee must develop an Emergency Response and Public Notification Plan ("plan"), or ensure the facility's existing plan is current and accurate, per Schedule F, Section B, and Condition 8 within 6 months of permit effective date. The permittee must update the plan annually to ensure all information contained in the plan, including telephone and email contact information for applicable public agencies, is current and accurate. An updated copy of the plan must be kept on file at the facility for DEQ review. The latest plan revision date must be listed on the plan cover along with the reviewer's initials or signature.

3. Recycled Water Use Plan

In order to distribute recycled water, the permittee must develop and maintain a DEQ-approved Recycled Water Use Plan meeting the requirements in OAR 340-055-0025. The permittee must submit this plan or any significant modifications to DEQ for review and approval with sufficient time to clear DEQ review and a public notice period prior to distribution of recycled water. The permittee is prohibited from distributing recycled water prior to receipt of written approval of its Recycled Water Use Plan from DEQ. The permittee must keep the plan updated. All plan revisions require written authorization from DEQ and are effective upon permittee's receipt of DEQ written approval. No significant modifications can be made to a plan for an administratively extended permit (after the permit expiration date). Conditions in the plan are enforceable requirements under this permit. DEQ will provide an opportunity for public review and comment on any significant plan modifications prior to approving or denying. Public review is not required for minor modifications, changes to utilization dates or changes in use within the recycled water class.

4. Exempt Wastewater Reuse at the Treatment System

Recycled water used for landscape irrigation within the property boundary or in-plant processes at the wastewater treatment system is exempt from the requirements of OAR 340-055 if all of the following conditions are met:

- a. The recycled water is an oxidized and disinfected wastewater.
- b. The recycled water is used at the wastewater treatment system site where it is generated or at an auxiliary wastewater or sludge treatment facility that is subject to the same NPDES or WPCF permit as the wastewater treatment system.
- c. Spray and/or drift from the use does not migrate off the site.
- d. Public access to the site is restricted.

5. Wastewater Solids Annual Report

Until the permittee has an approved biosolids program, the permittee must submit a Wastewater Solids Annual Report each year documenting removal of wastewater solids from the facility during the previous calendar year. The permittee must use the DEQ approved wastewater solids annual report form. This report must include the volume of material removed and the name of the permitted facility that received the solids.

6. Biosolids Management Plan

Prior to distributing biosolids to the public, the permittee must develop and maintain a Biosolids Management Plan and Land Application Plan meeting the requirements in OAR 340-050-0031. The permittee must submit these plans and any significant modification of these plans to DEQ for review and approval with sufficient time to clear DEQ review and a public notice period prior to removing biosolids from the facility. The permittee must keep the plans updated. All plan revisions require written authorization from DEQ and are effective upon permittee's receipt of DEQ written approval. No significant modifications can be made to a plan for an administratively extended permit (after the permit expiration date). Conditions in the plans are enforceable requirements under this permit.

a. Site Authorization

The permittee must obtain written authorization from DEQ for each land application site prior to its use. Conditions in site authorizations are enforceable requirements under this permit. The permittee is prohibited from land applying biosolids to a DEQ-approved site except in accordance with the site authorization, while this permit is effective and with the written approval of the property owner. DEQ may modify or revoke a site authorization following the procedures for a permit modification described in OAR 340-045-0055.

b. Public Participation

- i. DEQ will provide an opportunity for public review and comment on any significant plan modifications prior to approving or denying. Public review is not required for minor modifications or changes to utilization dates.
- ii. No DEQ-initiated public notice is required for continued use of sites identified in the DEQ-approved biosolids management plan.
- iii. For new sites that fail to meet the site selection criteria in the biosolids management plan or that are deemed by DEQ to be sensitive with respect to residential housing, runoff potential, or threat to groundwater, DEQ will provide an opportunity for public comment as directed by OAR 340-050-0015(10).
- iv. For all other new sites, the permittee must provide for public participation following procedures in its DEQ-approved land application plan.

7. Wastewater Solids Transfers

- a. *Within state.* The permittee may transfer wastewater solids including Class A and Class B biosolids, to another facility permitted to process or dispose of wastewater solids, including but not limited to: another wastewater treatment facility, landfill, or incinerator. The permittee must satisfy the requirements of the receiving facility. The permittee must report the name of the receiving facility and the quantity of material transferred in the wastewater solids annual report identified in Schedule B.
- b. *Out of state.* If wastewater solids, including Class A and Class B biosolids, are transferred out of state for use or disposal, the permittee must obtain written authorization from DEQ, meet Oregon requirements for the use or disposal of wastewater solids, notify in writing the receiving

state of the proposed use or disposal of wastewater solids, and satisfy the requirements of the receiving state.

8. Hauled Waste Control Plan

The permittee may accept hauled wastes at discharge points designated by the POTW after receiving written DEQ approval of a Hauled Waste Control Plan. Hauled wastes may include wastewater solids from another wastewater treatment facility, septage, grease trap wastes, portable and chemical toilet wastes, landfill leachate, groundwater remediation wastewaters and commercial/industrial wastewaters.

9. Hauled Waste Annual Report

Once the permittee has an approved hauled waste program, the permittee must submit a Hauled Waste Annual Report each year documenting volume of hauled waste received at the facility during the previous calendar year. The permittee must use the DEQ approved hauled waste annual report form.

10. Groundwater Monitoring Plan

The permittee must develop a Groundwater Monitoring Plan within **12 months** of permit effective date. This plan must detail the groundwater monitoring well construction, location and sampling activities and techniques such as but not limited to: purge volumes, field parameter collection and stabilization, sample handling and management, laboratory selection, analytical methods, target detection levels, field instrument calibration, and sampling quality assurance and quality control measures. This plan must be submitted to DEQ for approval. A copy of the approved plan must be kept on file at the facility for DEQ review. The latest plan revision date must be listed on the plan cover.

11. Surface Water Monitoring Plan

The permittee must develop a Surface Water Monitoring Plan within **12 months** of permit effective date. This plan must detail the surface water monitoring locations and sampling activities and techniques such as but not limited to: methods used for sample collection, equipment decontamination, field parameter collection, field instrument calibration, sample handling and management, laboratory selection, analytical methods, target detection levels, and sampling quality assurance and quality control measures. This plan must be submitted to DEQ for approval. A copy of the plan must be kept on file at the facility for DEQ review. The latest plan revision date must be listed on the plan cover.

12. Operator Certification

a. Definitions

- i. "Supervise" means to have full and active responsibility for the daily on site technical operation of a wastewater treatment system or wastewater collection system.
- ii. "Supervisor" or "designated operator", means the operator delegated authority by the permittee for establishing and executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system in accordance with the policies of the owner of the system and any permit requirements.
- iii. "Shift Supervisor" means the operator delegated authority by the permittee for executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system when the system is operated on more than one daily shift.
- iv. "System" includes both the collection system and the treatment systems.

- b. The permittee must comply with OAR Chapter 340, Division 49, "Regulations Pertaining to Certification of Wastewater System Operator Personnel" and designate a supervisor whose certification corresponds with the classification of the collection and/or treatment system as specified in the DEQ Supervisory Wastewater Operator Status Report. DEQ may revise the permittee's classification in writing at any time to reflect changes in the collection or treatment system. This reclassification is not considered a permit modification and may be made after the

permit expiration date provided the permit has been administratively extended by DEQ. If a facility is re-classified, a certified letter will be mailed to the system owner from the DEQ Operator Certification Program. Current system classifications are publicized on the DEQ Supervisory Wastewater Operator Status Report found on the [DEQ Wastewater Operator Certification Homepage](#).

- c. The permittee must have its system supervised full-time by one or more operators who hold a valid certificate for the type of wastewater treatment or wastewater collection system, and at a grade equal to or greater than the wastewater system's classification.
- d. The permittee's wastewater system may be without the designated supervisor for up to 30 consecutive days if another person who is certified at no more than one grade lower than the classification of the wastewater system supervises. The permittee must delegate authority to this operator to supervise the operation of the system.
- e. If the wastewater system has more than one daily shift, the permittee must have another properly certified operator available to supervise operation of the system. Each shift supervisor must be certified at no more than one grade lower than the system classification.
- f. The permittee is not required to have a supervisor on site at all times; however, the supervisor must be available to the permittee and operator at all times.
- g. The permittee must notify DEQ in writing of the name of the system supervisor by completing and submitting the Supervisory Wastewater System Operator Designation Form along with the Delegated Authority form?). The most recent version of this form may be found on the [DEQ Wastewater Operator Certification homepage](#) *NOTE: This form is different from the Delegated Authority form. The permittee may replace or re-designate the system supervisor with another properly certified operator at any time and must notify DEQ in writing within 30 days of replacement or re-designation of the operator in charge. As of this writing, the notice of replacement or re-designation must be sent to Water Quality Division, Operator Certification Program, 700 NE Multnomah St, Suite 600, Portland, OR 97232-4100. This address may be updated in writing by DEQ during the term of this permit.
- h. When compliance with item (e) of this section is not possible or practicable because the system supervisor is not available or the position is vacated unexpectedly, and another certified operator is not qualified to assume supervisory responsibility, the Director may grant a time extension for compliance with the requirements in response to a written request from the system owner. The Director will not grant an extension longer than 120 days unless the system owner documents the existence of extraordinary circumstances.

13. Industrial User Survey

Industrial User Survey

- a. By the date listed in Table B1, the permittee must conduct an industrial user survey as described in 40CFR 403.8(f)(2)(i-iii) to determine the presence of any industrial users discharging wastewaters subject to pretreatment and submit a report on the findings to DEQ. The purpose of the survey is to identify whether there are any industrial users discharging to the POTW, and ensure regulatory oversight of these discharges to state waters.

Should the DEQ determine that a pretreatment program is required, the permit must be reopened and modified in accordance with 40 CFR 403.8(e)(1) to incorporate a compliance schedule for development of a pretreatment program. The compliance schedule must be developed in accordance with the provisions of 40 CFR 403.12(k), and must not exceed twelve (12) months.

14. Reopener Clause

This permit may be re-opened and modified to include new or revised discharge limitations, monitoring, or reporting requirements, compliance conditions and schedules, and special conditions. If necessary, DEQ will commence modification of this permit by notifying the permittee and seeking public comment on the proposed modifications.

The permittee is responsible for requesting modification of this permit to incorporate any proposed system alterations that require a change in the compliance conditions of this permit.

SCHEDULE E: PRETREATMENT ACTIVITIES

This permit does not include a pretreatment program.

SCHEDULE F: WPCF GENERAL CONDITIONS - Domestic

SECTION A. STANDARD CONDITIONS

1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and grounds for an enforcement action. Failure to comply is also grounds for DEQ to modify, revoke, or deny renewal of a permit.

2. Property Rights and Other Legal Requirements

Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other rights, or any infringement of federal, tribal, state, or local laws or regulations.

3. Liability

DEQ or its officers, agents, representatives, or employees may not sustain any liability on account of the issuance of this permit or on account of the construction or maintenance of facilities or systems because of this permit.

4. Permit Actions

After notice by DEQ, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including but not limited to the following:

- a. Violation of any term or condition of this permit, any applicable rule or statute, or any order of the Environmental Quality Commission;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts.

5. Transfer of Permit

This permit may not be transferred to a third party without prior written approval from DEQ. DEQ may approve transfers where the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of this permit and the rules of the Environmental Quality Commission. A transfer application and filing fee must be submitted to DEQ.

6. Permit Fees

The permittee must pay the fees required by Oregon Administrative Rules.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

At all times the permittee must maintain in good working order and properly operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to comply with the terms and conditions of this permit.

2. Standard Operation and Maintenance

All waste collection, control, treatment, and disposal facilities or systems must be operated in a manner consistent with the following:

- a. At all times, all facilities or systems must be operated as efficiently as possible in a manner that will prevent discharges, health hazards, and nuisance conditions.
- b. All screenings, grit, and sludge must be disposed of in a manner approved by DEQ to prevent any pollutant from the materials from reaching waters of the state, creating a public health hazard, or causing a nuisance condition.

- c. Bypassing untreated waste is generally prohibited. Bypassing may not occur without prior written permission from DEQ except where unavoidable to prevent loss of life, personal injury, or severe property damage.

3. Noncompliance and Notification Procedures

If the permittee is unable to comply with conditions of this permit because of surfacing sewage; a breakdown of equipment, facilities or systems; an accident caused by human error or negligence; or any other cause such as an act of nature, the permittee must:

- a. Immediately take action to stop, contain, and clean up the unauthorized discharges and correct the problem.
- b. Immediately notify the appropriate DEQ regional office so that an investigation can be made to evaluate the impact and the corrective actions taken, and to determine any additional action that must be taken.
- c. Within 5 days of the time the permittee becomes aware of the circumstances, the permittee must submit to DEQ a detailed written report describing the breakdown, the actual quantity and quality of waste discharged, corrective action taken, steps taken to prevent a recurrence, and any other pertinent information.

Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or liability for failure to comply.

4. Wastewater System Personnel

The permittee must provide an adequate operating staff that is duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions of this permit.

5. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (e.g., public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed in accordance with General Condition B.6. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

6. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from bypasses or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

- a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
- b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
- c. Ensure immediate notification to the public, health agencies, and other affected entities (including public water systems). The response plan must identify the public health and other officials who will receive immediate notification;
- d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
- e. Provide emergency operations; and
- f. Ensure that DEQ is notified of the public notification steps taken.

SECTION C. MONITORING AND RECORDS

1. Inspection and Entry

The permittee must at all reasonable times allow authorized representatives of DEQ to:

- a. Enter upon the permittee's premises where a waste source or disposal system is located or where any records are required to be kept under the terms and conditions of this permit;
- b. Have access to and copy any records required by this permit;
- c. Inspect any treatment or disposal system, practices, operations, monitoring equipment, or monitoring method regulated or required by this permit; or
- d. Sample or monitor any substances or permit parameters at any location at reasonable times for the purpose of assuring permit compliance or as otherwise authorized by state law.

2. Averaging of Measurements

Calculations of averages of measurements required for all parameters except bacteria must use an arithmetic mean; bacteria must be averaged as specified in the permit.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures specified in the most recent edition of **Standard Methods for the Examination of Water and Wastewater**, unless other test procedures have been approved in writing by DEQ and specified in this permit.

4. Retention of Records

The permittee must retain records of all monitoring and maintenance information, including all calibrations, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. DEQ may extend this period at any time.

SECTION D. REPORTING REQUIREMENTS

1. Plan Submittal

Pursuant to Oregon Revised Statute 468B.055, unless specifically exempted by rule, construction, installation, or modification of disposal systems, treatment works, or sewerage systems may not commence until plans and specifications are submitted to and approved in writing by DEQ. All construction, installation, or modification shall be in strict conformance with the DEQ's written approval of the plans.

2. Change in Discharge

Whenever a facility expansion, production increase, or process modification is expected to result in a change in the character of pollutants to be discharged or in a new or increased discharge that will exceed the conditions of this permit, a new application must be submitted together with the necessary reports, plans, and specifications for the proposed changes. A change may not be made until plans have been approved and a new permit or permit modification has been issued.

3. Signatory Requirements

All applications, reports, or information submitted to DEQ must be signed and certified by the official applicant of record (owner) or authorized designee.

4. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the circumstances, unless a shorter time is specified in the permit. During normal business hours, DEQ's regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

The following must be included as information that must be reported within 24 hours under this paragraph:

- a. Any unanticipated bypass that exceeds any effluent limitation in this permit;
- b. Any upset that exceeds any effluent limitation in this permit;
- c. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit;
and
- d. Any noncompliance that may endanger human health or the environment.

A written submission must also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:

- a. A description of noncompliance and its cause;
- b. The period of noncompliance, including exact dates and times;
- c. The estimated time noncompliance is expected to continue if it has not been corrected;
- d. Steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and
- e. Public notification steps taken, pursuant to General Condition B.6.

DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

SECTION E. DEFINITIONS

1. *BOD* or *BOD₅* means five-day biochemical oxygen demand.
2. *CBOD* or *CBOD₅* means five-day carbonaceous biochemical oxygen demand.
3. *TSS* means total suspended solids.
4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.
5. *FC* means fecal coliform bacteria.
6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
8. *mg/l* means milligrams per liter.
9. *µg/l* means microgram per liter.
10. *kg* means kilograms.
11. *m³/d* means cubic meters per day.
12. *MGD* means million gallons per day.
13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.
15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.
16. *24-hour composite sample* means a combination of at least six discrete sample aliquots of at least 100 milliliters, collected at periodic intervals from the same location, during the operating hours of the facility over a 24 hour period. Four (rather than six) aliquots should be collected for volatile organics analyses. The composite must be flow or time proportional, whichever is more appropriate. The sample aliquots must be collected and stored in accordance with procedures prescribed in the most recent edition of *Standard Methods for the Examination of Water and Wastewater*.
17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
18. *Quarter* means January through March, April through June, July through September, or October through December.
19. *Month* means calendar month.
20. *Week* means a calendar week of Sunday through Saturday.
21. Commission or Environmental Quality Commission means the governor appointed panel which serves as the Oregon Department of Environmental Quality's policy and rulemaking board.
22. Department means the Oregon Department of Environmental Quality.

Signature: Shannon Davis
Shannon Davis (Apr 18, 2022 16:53 PDT)

Email: shannon.davis@deq.oregon.gov






103281-PERM-JOHNDAYWWTF20220418

Final Audit Report

2022-04-18

Created:	2022-04-18
By:	Patty Isaak (patty.isaak@deq.oregon.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAA0cJKu8pEMz9utZ1Ds_1MTkfPsRUI-cgy

"103281-PERM-JOHNDAYWWTF20220418" History

-  Document created by Patty Isaak (patty.isaak@deq.oregon.gov)
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-  Document emailed to Shannon Davis (shannon.davis@deq.oregon.gov) for signature
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-  Document e-signed by Shannon Davis (shannon.davis@deq.oregon.gov)
Signature Date: 2022-04-18 - 11:53:28 PM GMT - Time Source: server
-  Agreement completed.
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APPENDIX C

EXAMPLE PRODUCT DATA



HIGH-DENSITY
POLYETHYLENE
WATER AND SEWER

MEETS AWWA C901, AWWA C906,
ASTM D2239, ASTM D2737, ASTM D3035, F714



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APPLICATIONS

HIGH-DENSITY POLYETHYLENE WATER AND SEWER PIPE

PE 4710 JM EAGLE™ HDPE PRESSURE PIPE PRIMARY PROPERTIES

TABLE 1

PROPERTY	UNIT	TEST PROCEDURE	TYPICAL VALUE
MATERIAL DESIGNATION	—	PPI-TR4	PE 4710
CELL CLASSIFICATION	—	ASTM D3350	445574C
DENSITY	g/cm ³	ASTM D1505	0.959
MELT INDEX	g/10 minutes	ASTM D1238	< 0.15
FLEXURAL MODULUS	psi	ASTM D790	110,000 to < 160,000
TENSILE STRENGTH	psi	ASTM D638	3500 to < 4000
SCG (PENT)	Hours	ASTM F1473	> 500
HDB @ 73.4°F (23°C)	psi	ASTM D2837	1600
COLOR; UV STABILIZER	—	—	Black with minimum 2% carbon black
BRITTLINESS TEMPERATURE	°F (°C)	ASTM D746	< -130
HARDNESS	Shore D	ASTM D2240	≥ 60

Note: Gray Pipe Cell Classification 445574E

The physical (or chemical) properties of JM Eagle™ products described herein represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice.

* For data, sizes, or classes not reflected in these charts, please contact JM Eagle™ for assistance.

APPLICATIONS

HIGH-DENSITY POLYETHYLENE WATER AND SEWER PIPE

(CONTINUED)

JM EAGLE™ HDPE MARKETS AND APPLICATIONS

TABLE 2

MARKET	APPLICATION	PRODUCT
MUNICIPAL/INDUSTRIAL	Underground Potable Water Distribution, Mining, Dredging, River/Stream/Lake Crossing, Highway Drainage, Highway Crossing, Oil Patch, Agriculture Water Distribution, Landfill	I.P.S./D.I.P.S.
DRAINAGE	Storm Water, Culverts, Highway/ Residential/Agricultural Water Collection	I.P.S./D.I.P.S.
SANITARY SEWER	Gravity Sewer Systems, Sewer Force Mains, Directional Bore	I.P.S./D.I.P.S. Green Stripe
WATER DISTRIBUTION	Potable Water Systems, Water Service Systems	I.P.S./D.I.P.S. Blue Stripe, C.T.S.
IRRIGATION	Underground Irrigations Systems, Agricultural Systems	I.P.S./S.I.D.R.
REHABILITATION	Slip Lining, Pipe Bursting	I.P.S./D.I.P.S. Gray Slip Liner
RECLAIMED WATER	Water Re-processing Systems	I.P.S./D.I.P.S. Purple Stripe
PERFORATED PIPE	Landfill Gas Collection, Waste Drainage Systems	60°, 90°, 120°, & 180° Perforated I.P.S./D.I.P.S.
MINING	Liquid Chemical Mining, Slurry and Tailing Lines, Mineral Extract System	I.P.S./D.I.P.S.
GEO-THERMAL HEATING/COOLING	Heating/Cooling System for home and business	I.P.S.
FIRE PROTECTION SYSTEMS	Factory Mutual (FM) Approved	I.P.S.

SURGE DESIGN

SURGE PRESSURES IN VARIOUS PRESSURE PIPE

Surge Pressure refers to the maximum hydraulic transient pressure increase (sometimes called “water hammer”) in excess of the operating pressure that is anticipated in the system as the result of sudden changes in velocity of the water column. Polyethylene pipe has excellent water hammer properties and is designed to withstand surge pressure. **Table 3** shows the PC ratings, surge allowance, and corresponding allowable sudden velocity change in flow velocity for standard dimension ratios (DR’s). For recurrent surges, the allowance is 50% of the PC. For occasional surges, the allowance is 100% of the PC.

TABLE 3

DR	psi	RECURRING SURGE EVENTS		OCCASIONAL SURGE EVENTS	
		Surge Capacity (psi)	Corresponding Sudden Velocity Change (fps)	Surge Capacity (psi)	Corresponding Sudden Velocity Change (fps)
7.3	254	127.0	6.9	254.0	13.8
9	200	100.0	6.2	200.0	12.4
11	160	80.0	5.6	160.0	11.1
13.5	128	64.0	5.0	128.0	10.0
17	100	50.0	4.4	100.0	8.9
21	80	40.0	4.0	80.0	8.0
26	64	32.0	3.6	64.0	7.2
32.5	51	25.4	3.2	50.8	6.4

PRESSURE CLASS AND SERVICE TEMPERATURE

Pressure Class (PC) is the design capacity to resist working pressure up to 80°F (27°C) maximum service temperature, with specified maximum allowances for recurring positive pressure surges above working pressure. **Table 4** shows the temperature compensation multipliers for applications anticipating higher service temperatures.

TABLE 4

SERVICE TEMPERATURE

COMPENSATION MULTIPLIERS FOR MAXIMUM CONTINUOUSLY APPLIED SERVICE TEMPERATURE.

≤ 80 °F	≤ 90 °F	≤ 100 °F	≤ 110 °F	≤ 120 °F	≤ 130 °F	≤ 140 °F
1.00	0.90	0.78	0.75	0.63	0.60	0.50

Please note that the maximum service temperature is 140°F for pressure applications. For non-pressure applications, the maximum service temperature is limited to 176°F.



SHORT FORM SPECIFICATION

HIGH-DENSITY POLYETHYLENE WATER AND SEWER PIPE

SCOPE

This specification designates general requirements for ½" through 63" High-Density Polyethylene (HDPE) PE 3408/3608/4710 for the Municipal and Industrial Water and Sewer Distribution Systems.

MATERIALS

JM Eagle™ HDPE water pipe is manufactured with premium, highly engineered 4710 resin that provides maximum performance benefits to service all of today's municipal and industrial water needs. They are formulated with a minimum of 2% carbon black for maximum protection against UV rays for added assurance. Our PE 4710 HDPE material conforms to ASTM D3350 with the cell classification of 445574C, and is listed with The Plastics Pipe Institute (PPI). Please contact JM Eagle's Polyethylene department for PE 100 pipe availability.



STANDARD LAYING LENGTHS

The standard laying length of HDPE pressure water pipe is 40/50 feet. Smaller size pipe 6" and under can be extruded at continuous coil lengths by request. Longer lengths provide convenience in installation and allow for significant cost savings in labor and equipment.

INSTALLATION DESIGN

HDPE pipe provides effortless installation utilizing the newest technology available today. Our pipe can be joined by various heat fusion methods (see installation guide) such as electrofusion, socket fusion, butt fusion and saddle fusion. Mechanical connections can also be applied to HDPE pipe. HDPE pipe can also operate in other advanced applications such as Pipeline Rehabilitation, Slip Lining and Horizontal and Directional Drilling.

IRON PIPE SIZE (I.P.S.)/DUCTILE IRON PIPE SIZE (D.I.P.S.) OUTER DIAMETER

JM Eagle™ HDPE pipe is available in both I.P.S. and D.I.P.S. sizes for your convenience and can be connected directly without the use of adaptors or complicated procedures.



APPLICATIONS

JM Eagle™ HDPE pipe is versatile and can be used in a wide range of applications covering all piping markets. Our pipe has been utilized in pressure water systems, sewer and wastewater, Geo-Thermal, mining, rehabilitation, and irrigation.



DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

(CONTINUED)

JM EAGLE™ HDPE DUCTILE IRON PIPE SIZE (D.I.P.S.) PRESSURE PIPE (continued)

TABLE 5

ANSI/NSF-61, 14 LISTED

PE 4710		DR 21 (100 psi)			DR 26 (80 psi)			DR 32.5 (63 psi)		
PIPE SIZE	AVG. O.D.	MIN. T.	AVG. I.D.	WEIGHT LB/FT	MIN. T.	AVG. I.D.	WEIGHT LB/FT	MIN. T.	AVG. I.D.	WEIGHT LB/FT
4	4.800	0.229	4.315	1.44	0.185	4.408	1.18	0.148	4.486	0.95
6	6.900	0.329	6.203	2.98	0.265	6.338	2.43	0.212	6.451	1.96
8	9.050	0.431	8.136	5.13	0.348	8.312	4.18	0.278	8.461	3.37
10	11.100	0.529	9.979	7.72	0.427	10.195	6.29	0.342	10.375	5.08
12	13.200	0.629	11.867	10.91	0.508	12.123	8.91	0.406	12.339	7.18
14	15.300	0.729	13.755	14.66	0.588	14.053	11.95	0.471	14.301	9.65
16	17.400	0.829	15.643	18.96	0.669	15.982	15.46	0.536	16.264	12.49
18	19.500	0.929	17.531	23.81	0.750	17.910	19.95	0.600	18.228	15.67
20	21.600	1.029	19.419	29.22	0.831	19.838	23.84	0.665	20.190	19.24
24	25.800	1.229	23.195	41.68	0.992	23.697	33.99	0.794	24.117	27.44
30	32.000	1.524	28.769	64.11	1.231	29.390	52.31	0.985	29.912	42.22
36	38.300	1.824	34.433	91.84	1.473	35.177	74.92	1.179	35.801	60.43
42	44.500	2.119	40.008	123.96	1.712	40.871	101.17	1.370	41.596	81.59
48	50.800	2.419	45.672	161.55	1.954	46.658	131.83	1.563	47.486	106.34

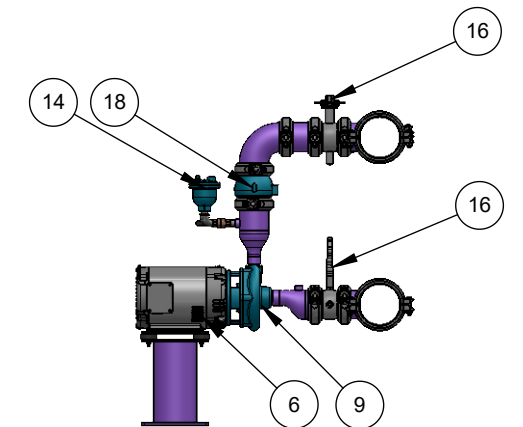
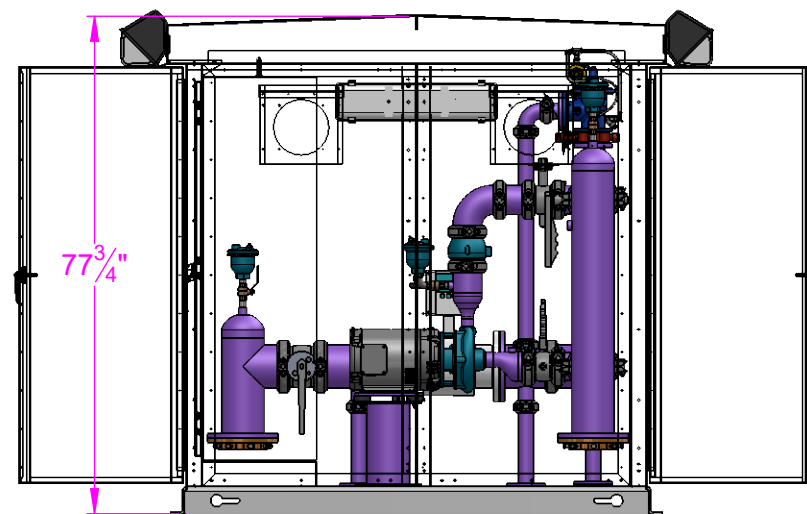
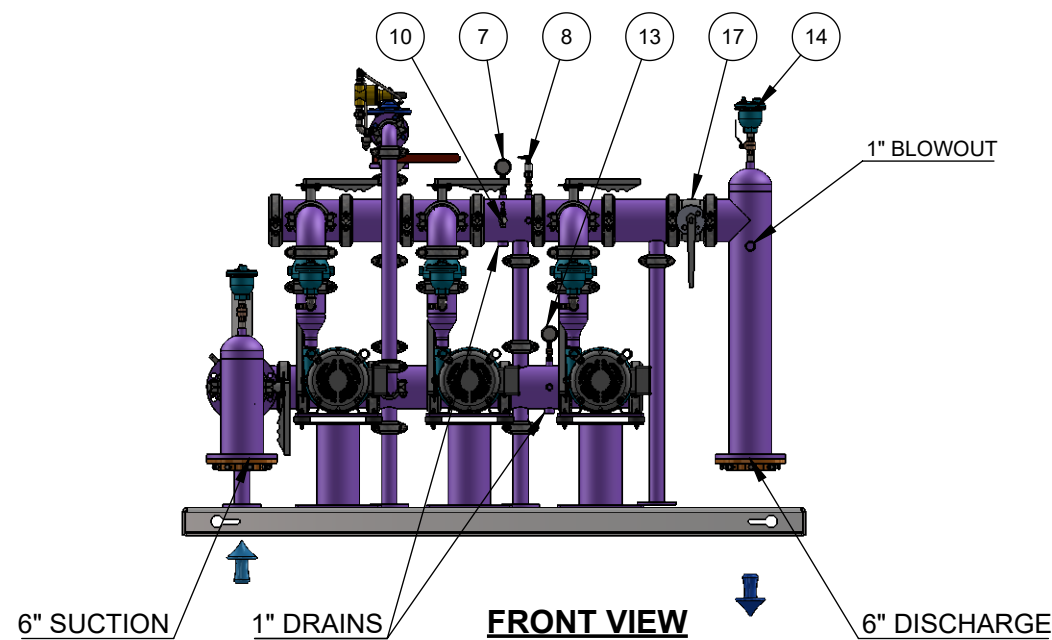
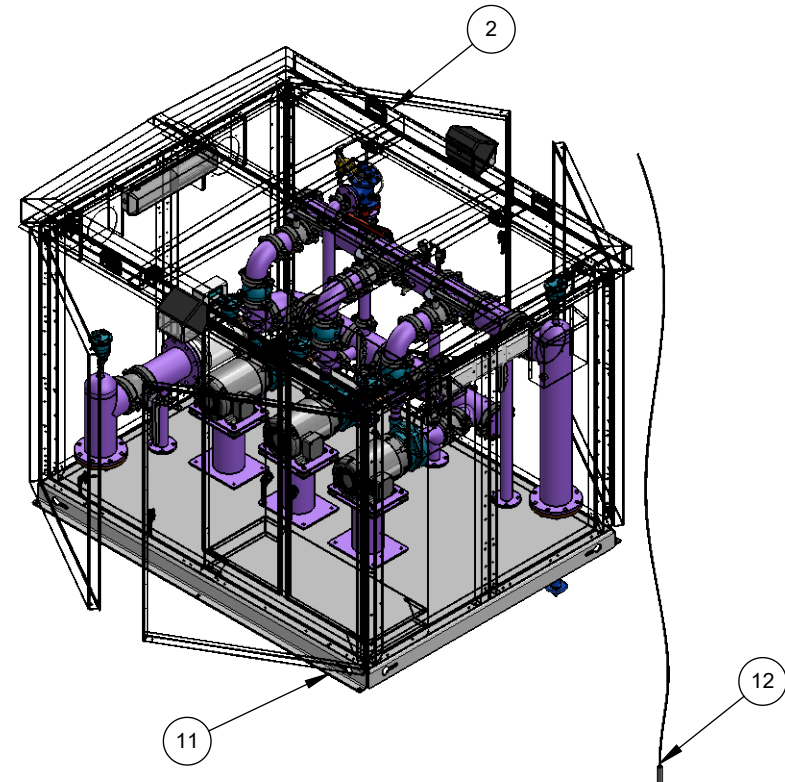
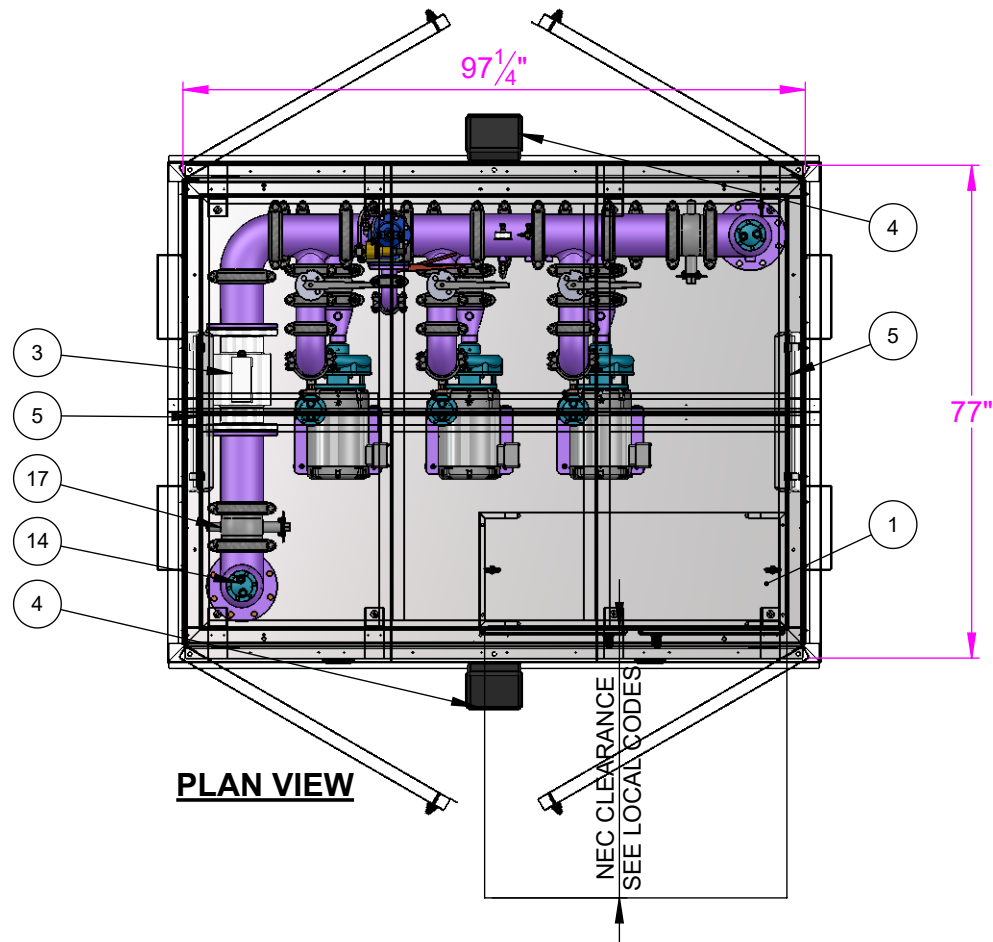
* For custom DR, perforated pipe, please contact JM Eagle™ PE sales at (800) 621-4404 for availability.

* All dimensions are in inches unless noted otherwise.

DESIGN SPECIFICATIONS

Design Flow Rate:	360 GPM @ 70 PSI Boost
Duty Pump Details:	15 HP/Pump 180 GPM @ 162 TDH
Minimum Power:	480 Volt / 3 Phase
Model #	CB##V3C015X00360-070XXXB483ONS-6

ITEM NO.	DESCRIPTION	Size	QTY.
1	CONTROL PANEL		1
2	ENCLOSURE, MARINE GRADE ALUMINUM W/ INSULATION	72"x96"x66"	1
3	FLOW METER, BADGER	6"	1
4	LIGHT FIXTURE, EXTERNAL		2
5	LIGHT FIXTURE, LED	24"	2
6	MOTOR, 3600 RPM, ODP		3
7	PRESSURE GAUGE, 160PSI	2-1/2"	1
8	PRESSURE TRANSDUCER, 200PSI	1/4"	1
9	PUMP, CENTRIFUGAL		3
10	SAMPLE TAP	1/2"	1
11	SKID, BENT	72x96	1
12	TRANSMITTER, LEVEL, GLT500		1
13	VACUUM/PRESSURE COMBO GAUGE, -30_+30PSI	2-1/2"	1
14	VALVE, AIR RELIEF	3/4"	5
15	VALVE, BUTTERFLY, LUG, LEVER, 250 PSI	2"	1
16	VALVE, BUTTERFLY, GROOVE, LEVER	4"	6
17	VALVE, BUTTERFLY, GROOVE, LEVER	6"	2
18	VALVE, CHECK, GROOVED	4"	3
19	VALVE, PRESSURE RELIEF, ANGLED	2"	1



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 208-323-5300
 www.gopps.us

MATERIAL
 Piping: STEEL A53, NSF NAPGUARD BLUE
 Skid: STEEL A36, GALVANIZED

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL: ±1/8"
 ONE PLACE DECIMAL: ±.10
 TWO PLACE DECIMAL: ±.05
 DO NOT SCALE DRAWING

TITLE:	FLOODED SUCTION PUMP STATION
PROJECT:	JOHN DAY RECYCLED
LEVEL:	60% Pre-Final
PART NO.:	3C-6-NJ-XX-NF-FM-AL-PT
SALESMAN: Matt Purdy	
DRAWN: PAAB	DATE: 7/20/2023
JOB:	SIZE: B SCALE: NTS SHEET: 1 OF 1 REV -



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EVERSTORE®

LONGEVITY

United Industries Group, Inc. is a privately held company established in 1969 and incorporated in the USA in 1972, UIG has been committed to bolted tank design, fabrication, and innovation. When they said it could not be done, UIG made it happen by breaking through the barrier of old technology and designing the first million-gallon storage tank. Our commitment to excellence continues with our **EVERSTORE®** line of Glass-Fused-to-Steel Bolted Tanks.



COATING MATTERS

Whether your project needs simple agricultural storage or has more for more aggressive applications — UIG can custom formulate our enamel glass coating to specifically suit your application for the best and most durable coating in the industry. Our custom-made frits are fired at extreme temperatures. When the frit flows it fuses. When cooled produces a smooth, durable, **glasslike** coating on metal. The result is an integrated layered composite of glass and metal that is tougher and more corrosion resistant than the original material.

DESIGN AND ENGINEERING

EVERSTORE® tanks' specialized design and construction provide decades of low-cost storage regardless of the application. From potable water to leachate storage, our team of professionals is here to help.

UIG's **EVERSTORE®** Glass-Fused-to-Steel tanks are 100% compliant with AWWA D-103 Standard for bolted tank manufacturing. From the steel to the coating, hardware, sealant, and accessories, UIG tanks are fully compliant. Together with our **EVERDOME®** Geodesic Dome Roofs, UIG tanks are designed by world-class engineers with over a century of combined experience. UIG's capabilities include professionally recognized agencies and groups such as AWWA, API, AISC, NBCC, British Standard, EN 15282/ISO 28765, NFPA 22, IBC, FM, NSF 61, AWS, UL, and more. Utilizing our advanced operations, tanks for special conditions such as heavy liquids, high wind factors, snow, or seismic loadings can be designed for maximum efficiency, long-life, and service.

FACTORY CUT OPENINGS

Exposed steel has a greater susceptibility to corrosion which is why UIG pioneered the use of mechanically rounded sheet edges. UIG **EVERSTORE®** panel **openings** are **factory cut** before enameling to protect the integrity of the tank and ensure longer life. To cut time and expense, most manufacturers rely on field cutting panel openings. This practice causes damage to the glass coating, leaving steel edges exposed to the environment.



GLASS FUSED-TO-STEEL BOLTED TANKS

UNDER THE GLASS

With adherence to AWWA-D-103 guidelines, UIG can provide our proprietary rich carbon steel panels which go above and beyond industry standards. UIG panels have greater tensile strength and less weight. Our breakthrough technology produces a panel specifically formulated for the enameling process resulting in greater consistency. Better glass adherence, better performance, better product.



UIG **EVERSTORE**® Bolted Storage Tanks are used in a wide range of applications including harsh chemicals. Resistant to attacks from most chemicals and mixtures of corrosive materials. In addition, it has a smooth and anti-stick inert surface. It is easy to clean and does not introduce impurities to the process materials.

ASSEMBLY & ACCESSORIES

UIG's factory-trained installers assemble our tanks from the top-down utilizing a specialized jacking system which lifts the tank, keeps the crews safely on the ground, and completes the installation in a fraction of the time.

UIG manufactures and offers a full product line of options and accessories for our tanks including Domes, roof walkways, railings, caged ladders, platforms, sidewall and roof manways, hatches, vents, liquid level indicators, cathodic protection, steel roof, steel floor, gravity vents and any customized item your project may require.



STEEL ENAMELING PROCESS

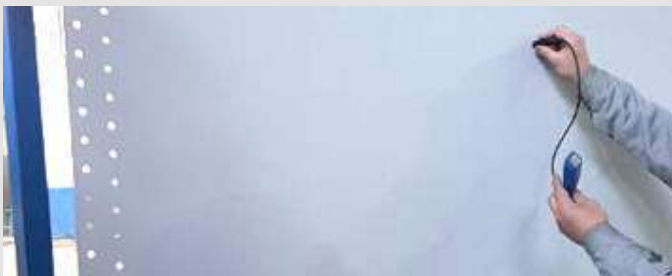
UIG employs the latest breakthrough technology in tank enameling industry for our **EVERSTORE®** line. Superfine glass foam-like structure of the enameled layer provides steel plates with excellent flexibility and durability. The impermeable barrier, applied both interior and exterior, will not dull or need re-coating during the service life of the tank. Resistant to liquid and vapor, the inert silica glass fused to steel safeguards against impact, abrasion, and corrosion. **ONLY** UIG offers standard and any **CUSTOM** color for interior and exterior including Titanium Dioxide (TiO₂) white!

Step 1:
Plate Fabrication and
Rolling

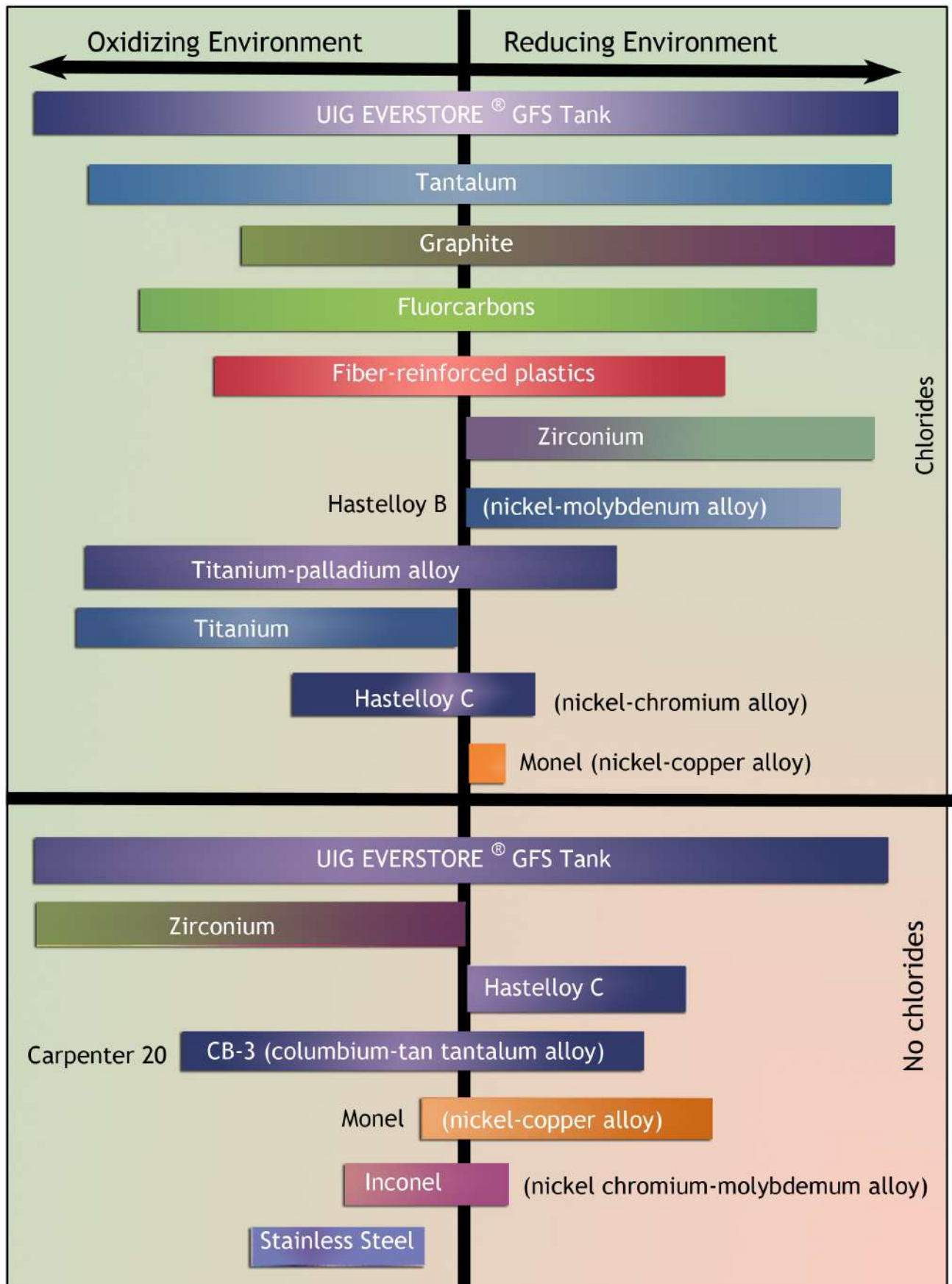


Step 2:
Preparing for
Glass Frit Application

Step 3:
High Temperature Firing
at 1450°F - 1600°F
(790°C - 870°C)



Step 4:
Holiday Testing Line



WATER SUPPLY AND TREATMENT APPLICATIONS

Potable Water - Purified Water - RO Water - Bitter/Brackish Water

Disinfecting Water - Sea Water Desalination - Irrigation Water

Raw Water/Fresh Water - Fire Fighting Water - Irrigation Water - Aeration Tank

Saline Water/Brine Water - Clarification Pool - Biological Filter - Sedimentation Container

POWER AND ENERGY APPLICATIONS

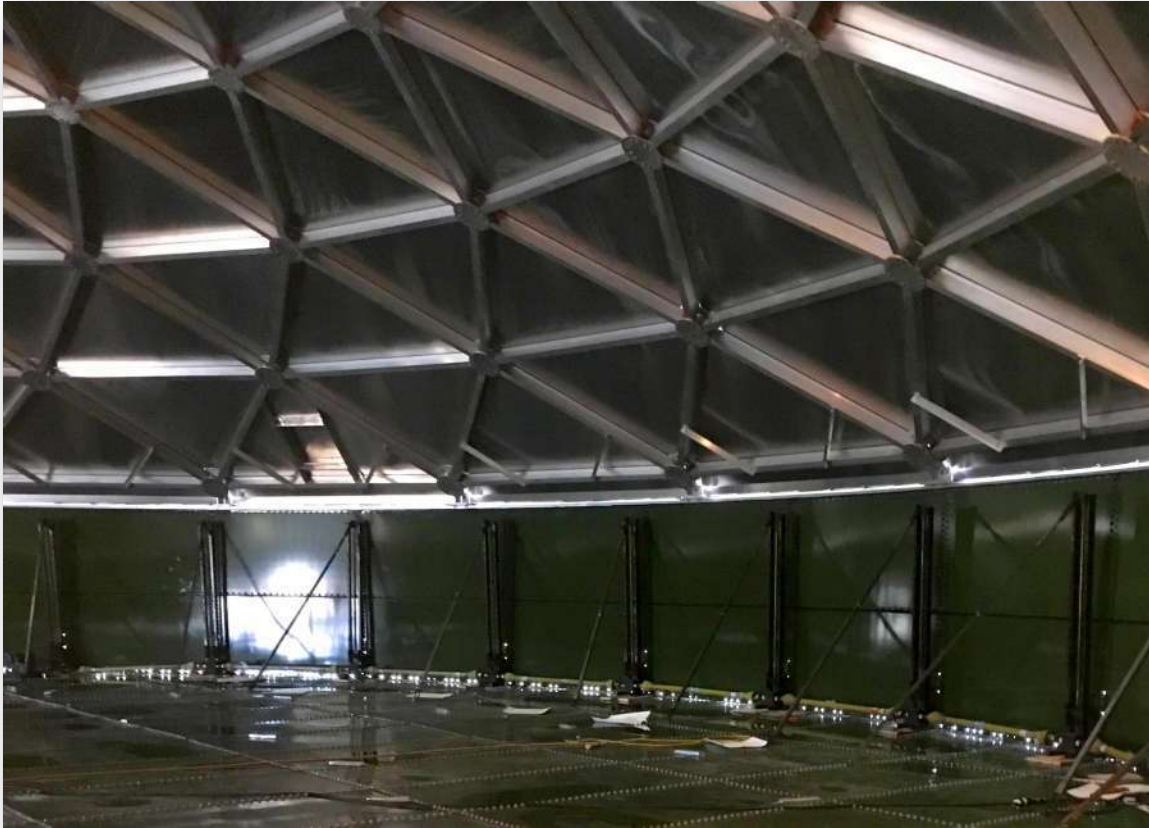
Crude Oil - Fuel Oil - Diesel - Aviation Oil - Kerosene

Drilling Mud - Process Water - DI Water - Reverse Osmosis Water

Boiler Feed Water - Coal Storage - Fly Ash Silo - Geothermal Water



Above photo: 1 Million USG EVERSTORE® Glass Fused-to-Steel Tank with Spiral Staircase



Above photo: Interior of steel floor tank using jacking procedure for assembly

WASTEWATER TREATMENT APPLICATIONS

Buffer Pool - Regulating Tank - Water Purifying Tank - Aerobic Reactor
Anerobic Reactor - Sedimentation Container - Biological Filter - Leachate Storage
Effluent Treatment - Irrigation Water - Animal Wastes - Sludge Tank

INDUSTRIAL DRY BULK STORAGE

Mineral - Chemicals - Foods
Wood Product - Petrochemicals - Plastics
Stone/Clay/Glass - Mining Industry - Grain / Seeds-

EVERSTORE®

GLASS FUSED-TO-STEEL BOLTED TANKS

FOR MORE INFORMATION

Corporate Office Location

United Industries Group, Inc.

11 Rancho Circle

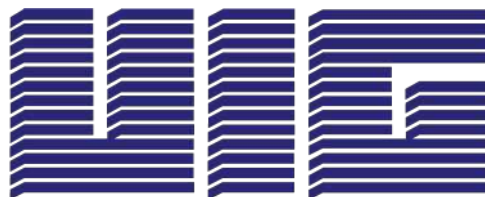
Lake Forest, CA 92630

Phone +1-(949) 759-3200 Fax +1(949) 759-3425

Email: info@unitedind.com Web: www.unitedind.com



AWWA
MEMBER



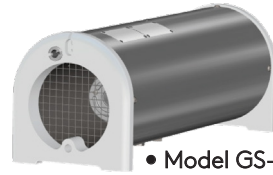
GridBee® GS Series Submersible Mixers

Effective. Efficient. Affordable.

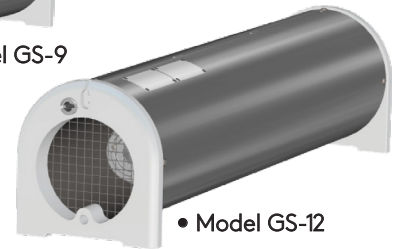
Reliable 24-hour active mixing with the lowest life-cycle cost. The benefits are immediate!

Benefits

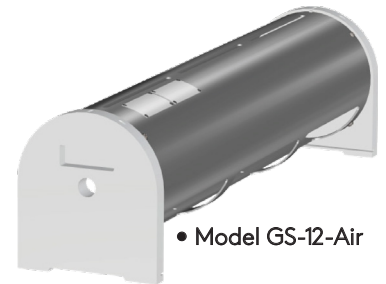
- Prevents stagnation, thermal stratification & short-circuiting.
- Provides uniform water age & equal distribution of disinfectant.
- Minimize chemical disinfectant usage & disinfection by-products.
- Increases contact time (baffle factor) in clearwells.
- Reduces nitrification in chloraminated systems.
- Eliminate energy intensive & costly deep-cycling and/or flushing of tanks.
- Reduces ice buildup & tank damage in cold climates.



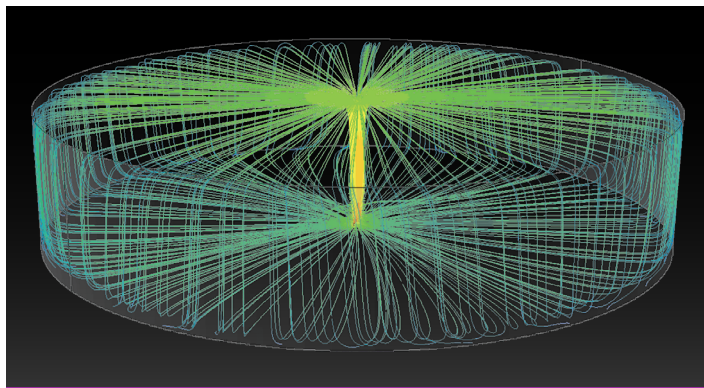
• Model GS-9



• Model GS-12



• Model GS-12-Air



CFD of a GS-12 in an 8 million gallon reservoir.

Performance Guaranteed.

Features

- Engineered for easy deployment.
- No tank entry required.
- Utilizes efficient sheet mixing technology.
- 316SS Construction.
- Certified to NSF/ANSI 61 and NSF/ANSI 372.
- 120VAC 1Ph Standard.
- 240VAC 1PH or 460vAC 3PH available.
(for GS-9 and GS-12 models only)
- 5-Year Warranty.
- Liquid disinfectant boosting port.

Effective mixing for any tank size, any tank build.



NSF / ANSI Standard 61 Certified By

	NSF	UL	CSA
GS Mixer	X		
GS Motor		X	X

NSF / ANSI Standard 372 Certified By

	NSF	UL	CSA
GS Mixer	X		
GS Motor		X	X

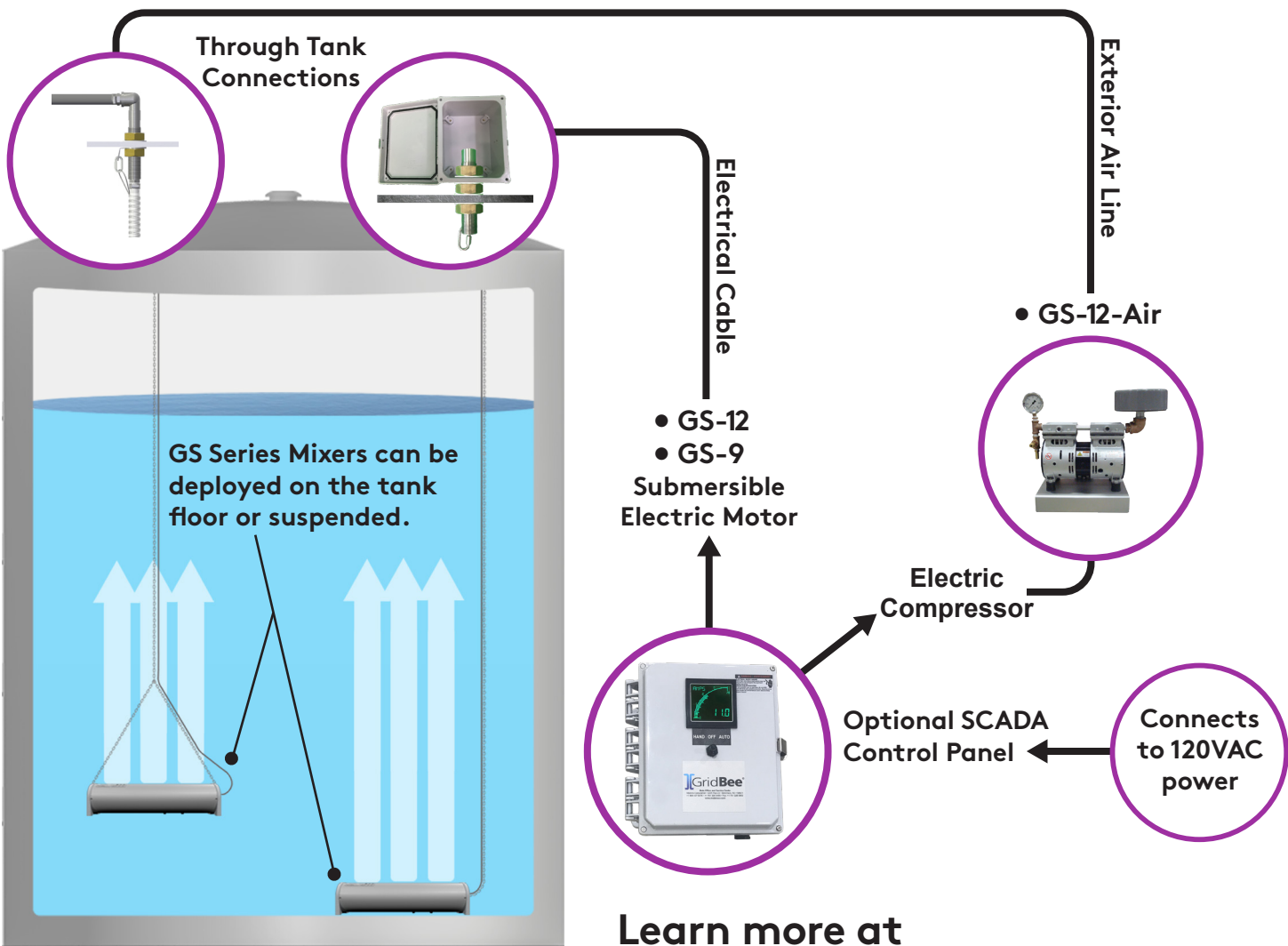
GridBee® GS Series Submersible Mixers

GridBee® GS Series Submersible Tank Mixers are easily deployed through a hatch, vent, or other tank opening twelve (12) inches or larger in diameter. The “GS” thoroughly mixes the entire tank volume from tank floor to water surface resulting in consistent disinfectant residuals, even temperature profiles and uniform water age.

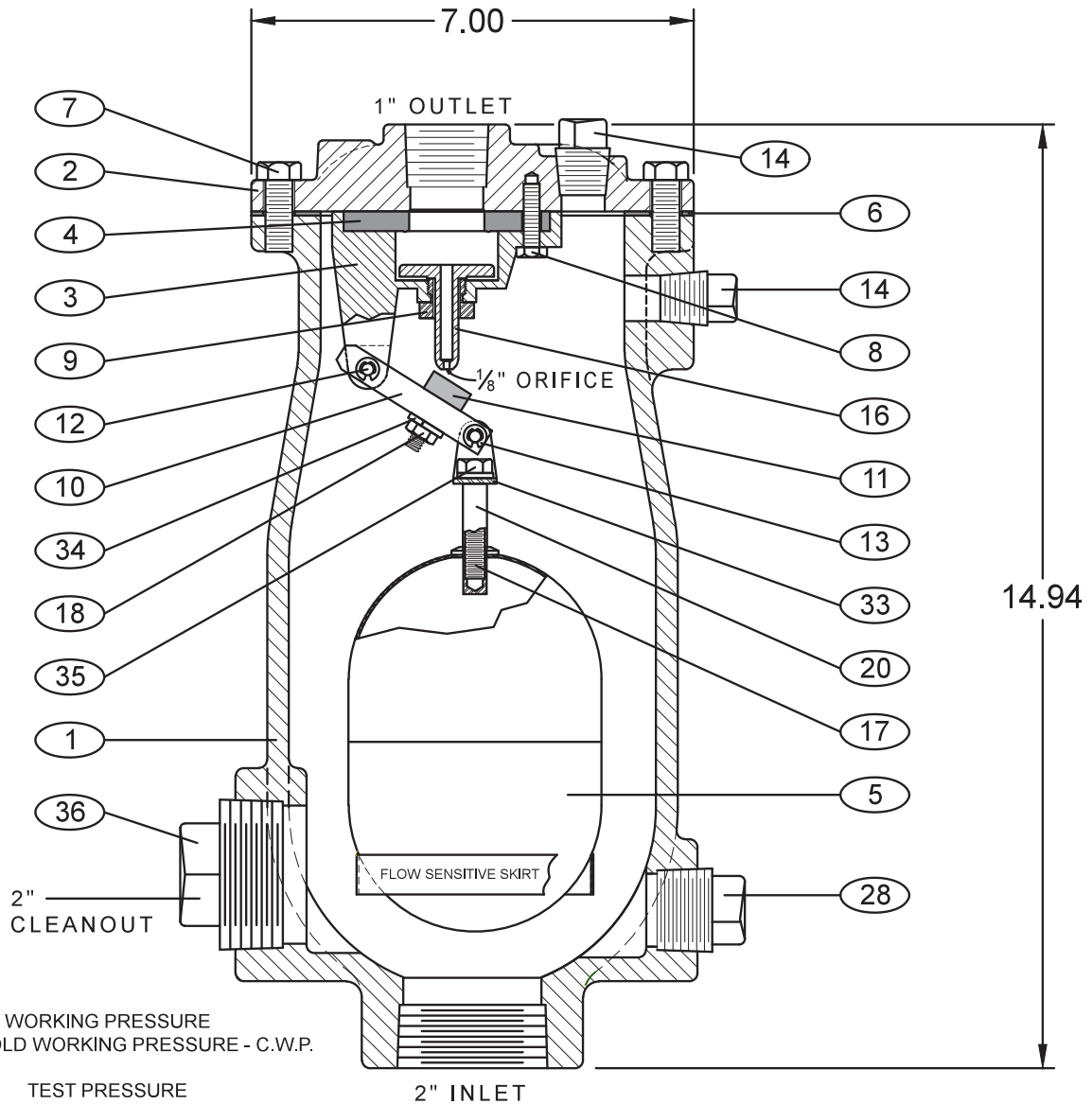
Assembled Machine Dimensions

	Length	Diameter	Weight
GS-9	24 in. (61 cm)	10 in. (25 cm)	65 lbs. (29 kg)
GS-12	36 in. (91 cm)	10 in. (25 cm)	75 lbs. (34 kg)
GS-12-Air	36 in. (91 cm)	10 in. (25 cm)	50 lbs. (23 kg)

Everything you need for a fast & efficient deployment is included!



Learn more at www.ixomwatercare.com



- | | | | | | |
|---|-----------------|----|----------------|----|----------------------|
| 1 | BODY | 9 | GUIDE BUSHING | 18 | LOCK NUT |
| 2 | COVER | 10 | FLOAT ARM | 20 | GUIDE SHAFT |
| 3 | BAFFLE | 11 | ORIFICE BUTTON | 28 | PIPE PLUG |
| 4 | SEAT | 12 | PIVOT PIN | 33 | CLEVIS |
| 5 | FLOAT | 13 | RETAINING RING | 34 | LOCK WASHER |
| 6 | GASKET | 14 | PIPE PLUG | 35 | GUIDE SHAFT RETAINER |
| 7 | COVER BOLT | 16 | PLUG | 36 | PIPE PLUG |
| 8 | RETAINING SCREW | 17 | FLOAT RETAINER | | |

SEE DRAWING NO. VM-801A-M FOR STANDARD MATERIALS OF CONSTRUCTION.
SEE DRAWING NO. VM-801ADISV-M FOR SUPER VALVE MATERIALS OF CONSTRUCTION.

WASTEWATER COMBINATION AIR VALVE

DATE 4-8-14

VAL-MATIC

VALVE AND MANUFACTURING CORP.

DRWG. NO.

VMC-801A

CLOW
VALVE CO.

ClowValve.com



RESILIENT WEDGE GATE VALVES

2" THROUGH 12"
MODEL 2639 / 2640

AWWA C509 250 PSI • UL/FM APPROVED 200 PSI • NSF
61 CERTIFIED • FULL WATER WAY • FUSION BONDED
EPOXY COATED • 10-YEAR LIMITED WARRANTY



Clow Valve, A Division of McWane, Inc.

For Generations

RESILIENT WEDGE VALVE

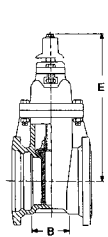
In 1975, Clow recognized the increased requirements and escalating maintenance cost of water systems in the United States.

Clow responded by introducing the first R/W (Resilient Wedge) Gate Valve in America. This introduction revolutionized the valve market in the U.S.

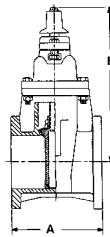
Clow was the first to introduce and still leads

in the design and technical development of the bubble-tight resilient seating valve.

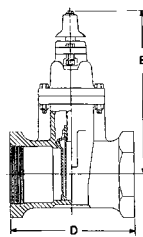
The Clow Resilient Wedge Valve, with its unique features and benefits, was the first to be manufactured with both AWWA and UL/FM approval for all water system requirements.



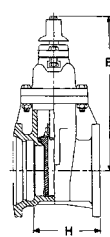
F-6100
MECHANICAL JOINT
2"– 12"



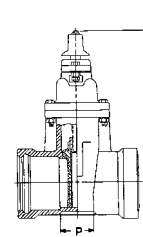
F-6102
FLANGED
2"– 12"



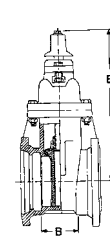
F-6103
THREADED ENDS
2"– 3"



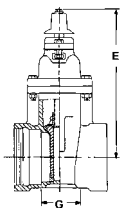
F-6106
FLANGED X MJ
3"– 12"



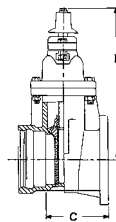
F-6110
PUSH ON FOR SDR PVC
2"– 12"



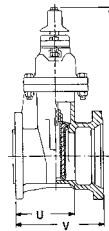
F-6111
MECHANICAL CUTTING
IN JOINT
4"– 12"



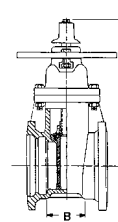
F-6112
TYTON ENDS FOR DUCTILE
IRON AND C900 PVC PIPE
4"– 12"



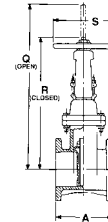
F-6113
FLANGED X TYTON
4"– 12"



F-6114
MECHANICAL JOINT
FOR TAPPING
3"– 12"



F-6120
MECHANICAL JOINT POST
INDICATOR VALVE
2"– 12"



F-6136
FLANGED OS & Y
CONSTRUCTION
2"– 12"

VALVE SIZE	A	B	C	D	E	G	H	P	Q	R	S	U	V	NO. OF TURNS TO FULL OPEN
2"	7	3-1/4	—	5-3/8	10-7/8	—	—	3	10	12	7-1/4	—	—	6-1/2
2-1/2"	7-1/2	—	—	7-1/8	11-3/8	—	—	3-1/4	16-3/8	13-7/8	7-1/4	—	—	8
3"	8	3-1/2	—	7-1/8	12-3/8	—	5-3/4	3-1/2	18-7/8	15-5/8	10	5-3/4	8-1/4	10
4"	9	4-1/2	6-3/4	—	14-3/4	4-5/8	6-3/4	4-1/2	22-3/4	18-1/4	10	6-3/4	9-1/4	13-1/2
6"	10-1/2	5-1/2	7-7/8	—	19	5-1/4	8	5	30-1/8	23-3/4	12	8	10-1/2	19-1/2
8"	11-1/2	8-1/8	8-1/2	—	22-1/2	5-5/8	9-3/4	5-1/2	37-3/4	29-1/4	14	10-3/4	13-1/4	25-1/2
10"	13	10-1/2	10	—	26-1/2	7	11-3/4	7	45-2/4	35-3/8	18	12-1/2	14-7/8	31-1/2
12"	14	10-3/4	11-1/4	—	30	8-1/2	12	8-1/2	53-1/8	40-5/8	18	12-1/2	15	37-3/4

NOTE: It is recommended that valves be installed with stems vertical when used in raw sewage, or sludge applications, or in water with excessive sediment. Flanged end connections are not recommended for buried service.

ENGINEERING FEATURES

THRUST BEARINGS

Acetal thrust bearings above and below the thrust collar reduce friction and minimize operating torque.

COPPER ALLOY STEM

Long, trouble-free life with high-strength, non-corrosive copper alloy stem and stem nut.

STAINLESS STEEL HARDWARE

Stainless steel nuts and bolts provide long-life corrosion protection.

100% COATED WEDGE

A fully encapsulated wedge ensures a bubble-tight seal every time, up to rated pressure (250 PSI), with its twin seal design.

ELLIPTICAL BOLT HOLES

Hole design on MJ connection permits the use of both standard hex bolts and anti-rotation bolts.

MINIMAL FLOW LOSS

A smooth, unobstructed waterway, which is free of pockets, cavities, and depressions, allows for minimal flow loss and lower pumping costs. All valves accept a full-size tapping cutter.

LIFTING LUG

Integrated lifting lugs on follower plate for setting the valve into position. Available 4"–12".



REPLACEABLE O-RINGS

Upper O-rings are replaceable with the valve fully open and subjected to full-rated working pressure.

NO FLAT GASKETS

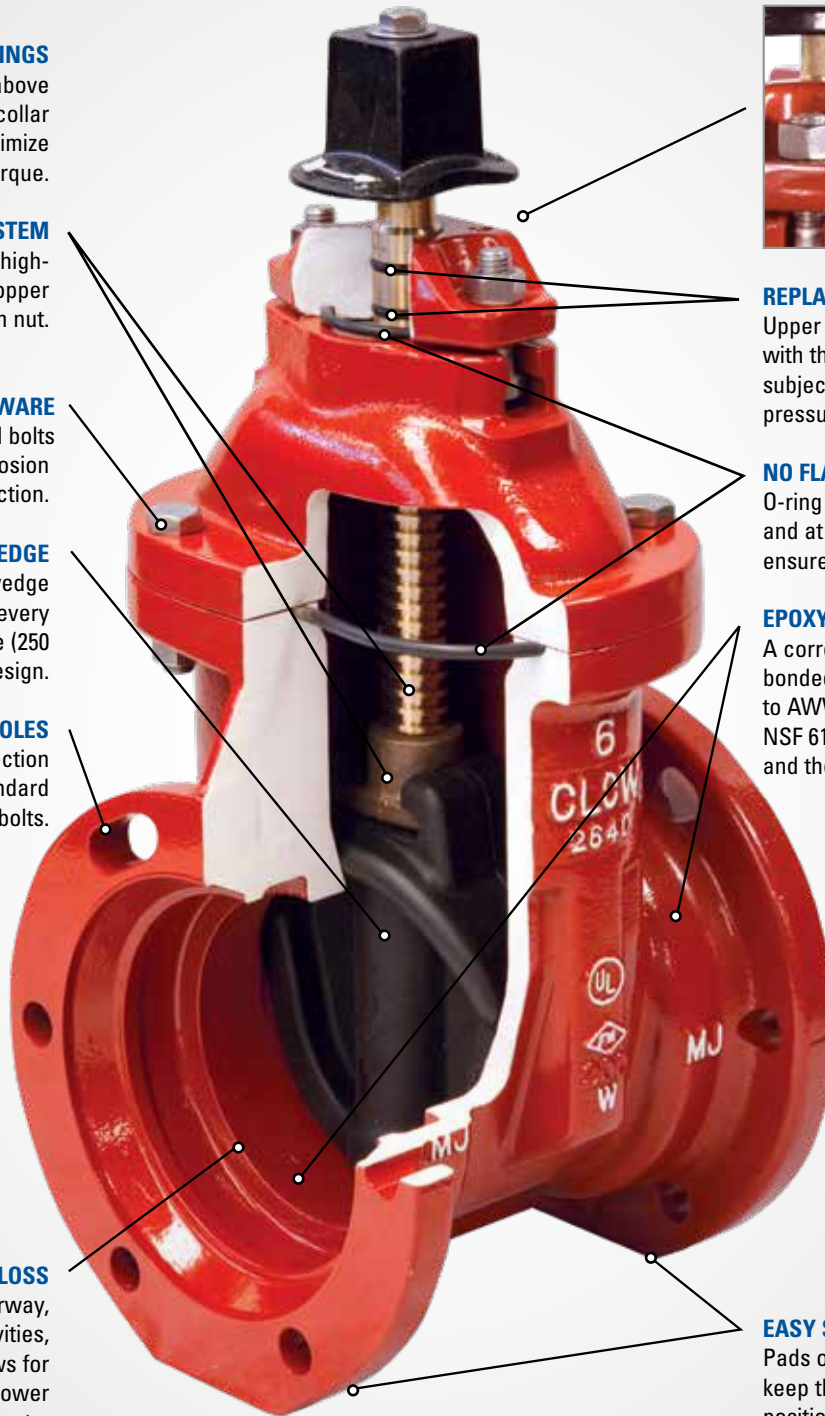
O-ring seals at the stuffing box and at the bonnet to body flange ensure the best possible seal.

EPOXY COATING

A corrosion resistant fusion-bonded epoxy coating, conforming to AWWA C550 and certified by NSF 61, protects both the interior and the exterior of the valve.

EASY STORAGE

Pads on the bottom of all valves keep the valve in an upright position for easier storage and protection from the elements.



VALVE RATING: All valves are rated at 250 PSI for AWWA service and 200 PSI for UL/FM service. All valves are hydrostatically tested to 500 PSI.

RECOMMENDED SPECIFICATIONS

1. Valves shall conform to the latest revision of AWWA Standard C509 covering resilient seated gate valves for water supply service.
2. The valves shall have an iron body, bonnet, and O-ring plate. The wedge shall be fully encapsulated with rubber.
3. The sealing rubber shall be permanently bonded to the wedge per ASTM D249.
4. Valves shall be supplied with O-ring seals at all pressure retaining joints. No flat gaskets shall be allowed.
5. The valves shall be either non-rising stem (NRS) or rising stem (OS&Y), opened by turning left or right, and provided with 2" square operating nut or a handwheel. The operating nut and the handwheel shall be marked indicating the direction to open with the word "OPEN" and an arrow.
6. NRS stems shall be cast copper alloy with integral collars in full compliance with AWWA C509. All stems shall operate with copper alloy stem nuts independent of the wedge.
7. All NRS stems shall have two O-rings located above thrust collar and one below. The upper o-rings shall be replaceable with valve fully opened and subjected to full pressure. The stems on 2"-12" NRS valves shall have a low torque thrust bearing located both above and below the stem collar to reduce friction during operation.
8. The waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves made with a tapping flange shall accept a full size tapping cutter.
9. The body, bonnet and O-ring plate shall be coated both on the interior and exterior with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 and certified per NSF 61.
10. Each valve shall have the manufacturer's name, the pressure rating, country of origin and the year in which it was manufactured cast on the body. Prior to shipment from the factory, each valve shall be hydrostatically pressure tested according to the requirements of AWWA C509 (and UL/FM where applicable).
11. Valves shall have all component parts cast and assembled in the USA and shall be manufactured by the Clow Valve Company.

COMMITTED TO ENVIRONMENTAL RESPONSIBILITY

Clow Valve Company is committed to protecting our natural resources through environmentally responsible manufacturing practices, including the use of 80+% recycled content in our hydrants and valves.



CLOW
VALVE CO.

902 South 2nd Street
Oskaloosa, IA 52577
Ph 641-673-8611
Fx 641-673-8269



POCKET ENGINEER
Available for iOS + Android
or online at pe.mcwane.com.



*PATENT PENDING
REVISION B-2022



ClowValve.com



Badger Meter

Recordall® Disc and Turbo Series Meters for Reclaimed Water

Sizes 5/8...12" (DN 15...300 mm)

Applications

For use in measurement of cold water in reclaimed water distribution systems. Meters are available for residential, commercial and industrial services where flow is in one direction only.

The meter and its internal components are for use in the measurement of non-potable water only. Caution must be exercised not to mingle non-potable and potable water meters and especially their internal components.

Utility Impacts

Utilities faced with rising water costs and limited water resources are developing non-potable, reclaimed water distribution systems. Accurate, dependable metering is needed to bill customers for these alternate supplies.

Special coloring and markings are designed to distinguish potable water meters from reclaimed water meters in accordance with current industry standards. The utility must develop appropriate operational procedures to ensure that potable water meters and reclaimed water meters and their internal components are not mingled.

Warranty

Due to the lack of a uniform definition of the composition of reclaimed water, the warranties associated with reclaimed water meters are different than the potable water Recordall meter line. Please review the warranty statement for this important difference.

Specifications

5/8...2" Recordall Disc Series Meters

1-1/2...12" Recordall Turbo Series Meters

For meter specifications for each Recordall size and type meter, see the Product Data Sheet for that specific meter.

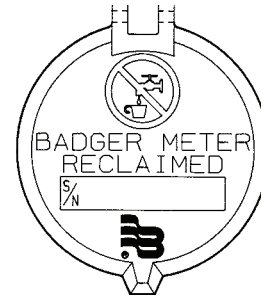
Thermoplastic shroud and lid only.

Special Markings

Local register	Lavender lid and shroud, "RECLAIMED" on dial face & non-potable water symbol on register lid
HR-E & HR-E LCD encoders	Lavender lid
Chamber assembly	Has designation for non-potable water only
Meter housings	"RCLM" etched on housings, bronze covers and bottoms
Cast iron bottoms (5/8...1" disc meters)	Lavender

Register Type

The Reclaimed water meter line supports the same types of registration and reading systems as the potable meter line.



Meter with local register

Making Water Visible®

Recordall is a registered trademark of Badger Meter, Inc. Other trademarks appearing in this document are the property of their respective entities.

Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists. © 2014 Badger Meter, Inc. All rights reserved.

www.badgermeter.com

The Americas | Badger Meter | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
México | Badger Meter de las Americas, S.A. de C.V. | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01050 | México, DF | México | +52-55-5662-0882
Europe, Middle East and Africa | Badger Meter Europa GmbH | Nurtlinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
Czech Republic | Badger Meter Czech Republic s.r.o. | Mařikova 2082/26 | 621 00 Brno, Czech Republic | +420-5-41420411
Slovakia | Badger Meter Slovakia s.r.o. | Racianska 109/B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
Asia Pacific | Badger Meter | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464836
China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412



ORION® Water Endpoints

Cellular LTE Endpoint

DESCRIPTION

The ORION® Cellular endpoint is an innovative, two-way water endpoint that utilizes existing cellular infrastructure to efficiently and securely deliver meter reading data to the utility via the reliable cellular network.

The Cellular endpoint is a member of the time-tested ORION family of products from Badger Meter, designed for maximum flexibility. Since 2002, the ORION product family has provided comprehensive Advanced Metering Analytics (AMA) for interval meter reading and data capture using both one-way and two-way communications.

FUNCTIONALITY

Operation: The endpoint communicates with the encoder and captures 15-minute interval read data and meter status information. On a regular schedule (up to twice per day) the endpoint then automatically broadcasts the information, including endpoint status information, via the cellular network to the BEACON® AMA software.

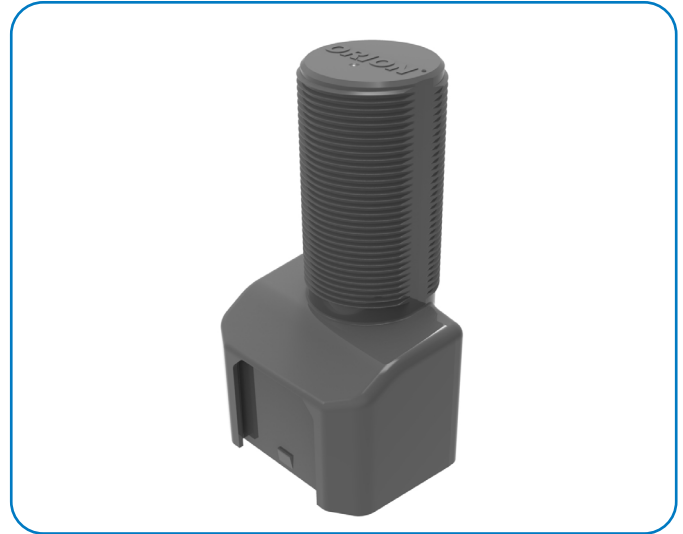
Activation: All ORION Cellular LTE endpoints are shipped in an inactive, non-transmitting state. The endpoints offer a Smart Activation feature. After installation, the endpoint begins broadcasting data when the encoder senses the first usage of water. No field programming or special tools are required. Alternatively, the Badger Meter IR Communication Device can be used to activate the endpoint and verify the encoder connection.

Successful endpoint function can be confirmed through a web app demonstrating that communication has been verified to both the encoder and the network.

Broadcast Mode: The endpoint broadcasts fixed network reading data through the secure existing cellular network within the service area. The endpoint also transmits a mobile message to support troubleshooting in the field.

Data Storage: The endpoint stores 42 days of 15-minute data.

Output Message: The endpoint broadcasts its unique serial number, meter reading data, and applicable status indicators. Each message is securely transported to the BEACON AMA software via Virtual Private Network (VPN) using Advanced Encryption Standard (AES) 256.



APPLICATION

Configurations: The endpoint is a multi-purpose endpoint that can be deployed in indoor, outdoor and pit applications. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.

Meter Compatibility: When attached to a Badger Meter High Resolution Encoder, the endpoint is compatible with all current Badger Meter Recordall® Disc, Turbo Series, Compound Series, Combo Series and Fire Service meters and assemblies, and with E-Series® Ultrasonic, E-Series® Ultrasonic Plus, and ModMAG® electromagnetic flow meters.

Encoder Compatibility: ORION Cellular LTE endpoints are suitable for use with Badger Meter High Resolution Encoders as well as the following Badger Meter approved three-wire encoder registers that have a manufacture date within 10 years of the current date as long as the encoder has three wires connected to it and is programmed into the three-wire output mode for AMR/AMI: Honeywell® (Elster) ScanCoder® encoder with Sensus® protocol module and evoQ4 meter (encoder output); Master Meter® Octave® Ultrasonic meter encoder output; Metron-Farnier Hawkeye; Mueller Systems 420 Solid State Register (SSR) LCD; and Sensus iPerl®.



SPECIFICATIONS

Dimensions	5.125 in. (130 mm) (H)
	1.75 in. (44 mm) Diameter at top 2.625 in. (W) x 2.875 in. (D) at base 67 mm (W) x 73 mm (D) at base
Broadcast Network	LTE cellular network, with fallback to 3G where LTE is unavailable. Mobile backup frequency is FCC-regulated 902...928 MHz frequency hopping modulation
Operating Temperature Range	
• Storage, Meter Reading and Mobile Backup	-40...60° C (-40...140° F)
• Cellular Communications	-20...60° C (-4...140° F)
Humidity	0%...100% condensing
Battery	One (1) lithium thionyl chloride D cell (nonreplaceable)

Construction: All ORION Cellular endpoints are housed in an engineered polymer enclosure with an ORION RF board, battery and antenna. To ensure long-term performance, the enclosure is fully potted to withstand harsh environments and to protect the electronics in flooded or submerged pit applications.

Wire Connections: ORION Cellular endpoints are available with in-line connectors (Twist Tight® or Nicor®) for easy installation and connection to compatible encoders/meters. The endpoints are also available with flying leads for field splice connections. Other wire connection configurations may be available upon request.

FEATURES

Communication Type	Two-way
Application Type	Control/Monitor
Reading Interval Type	15-minute
Encoder Compatibility	Absolute
Fixed Network Reading	✓
Premise Leak Detection	✓
Cut-Wire Indication	✓
Reverse Flow Indication	✓
No Usage Indication	✓
Encoder Error	✓
Low Battery Indication	✓
Remote Programming	✓
Remote Clock Synchronization	✓
Firmware Upgrades	✓

License Requirements: ORION Cellular LTE endpoints comply with Part 15, Part 22, Part 24, and Part 27 of the FCC Rules. No license is required by the utility to operate an ORION meter reading system. This device complies with Industry Canada license-exempt RSS standard(s).

Transportation: WARNING: The operation of transmitters and receivers on airlines is strictly prohibited by the Federal Aviation Administration. As such, the shipping of radios and endpoints via air is prohibited. Please follow all Badger Meter return and/or shipping procedures to prevent exposure to liability.

Warning: To reduce the possibility of electrical fire and shock hazards, never connect the cable from the endpoint to any electrical supply source. The endpoint cable provides SELV low voltage limited energy power to the load and should only be connected to passive elements of a water meter register.

Caution: The endpoint batteries are *not* replaceable. Users should make no attempt to replace the batteries. Changes or modifications to the equipment that are not expressly approved by Badger Meter could void the user's authority to operate the equipment.

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www.badgermeter.com

DESCRIPTION

ORION[®] Cellular water endpoints are innovative, two-way endpoints for smart water applications. The endpoints utilize existing IoT (Internet of Things) cellular infrastructure to efficiently and securely deliver meter reading data to the utility in a Network as a Service (NaaS) approach. Leveraging existing cellular infrastructure, the NaaS solution offers all the performance benefits of AMI, while eliminating network-related maintenance and technology concerns and enhancing deployment flexibility.

Cellular endpoints are members of the time-tested ORION family of products from Badger Meter, designed for maximum flexibility. Since 2002, the ORION product family has provided comprehensive Advanced Metering Analytics (AMA) for interval meter reading and data capture using both one-way and two-way communications.

FUNCTIONALITY

Operation: ORION Cellular water endpoints communicate with the encoder and capture 15-minute interval read data and meter status information. The endpoints then automatically broadcast the information, including endpoint status information, via the cellular network to BEACON[®] Software as a Service (SaaS). ORION NaaS is powered by the proven ORION system for interval data capture and two-way communication. The solution employs cellular endpoints which, as they leverage the public cellular network and require no proprietary gateways to operate, dramatically reduce infrastructure requirements compared to a traditional fixed network. This speeds installations and simplifies expansion as a system evolves.

The endpoints are designed to call in four times each workday and feature a configurable schedule that enables utility customers to select call-in times that best support their processes.

Activation: ORION Cellular water endpoints are shipped in an inactive, non-transmitting state. The Badger Meter IR Communication Device can be used to activate the endpoints and verify the encoder connection. Successful endpoint function can be confirmed through a web app demonstrating that communication has been verified to both the encoder and the network.

Alternatively, the endpoints offer a Smart Activation feature. After installation, the endpoints begin broadcasting data when the encoder senses the first usage of water. No field programming or special tools are required.

Broadcast Mode: ORION Cellular water endpoints broadcast fixed network reading data through the secure cellular network within the service area.

Specific configurations also transmit a radio frequency (RF) message to facilitate troubleshooting in the field. See "[Configurations](#)" on page 2.

Data Storage: The endpoints store 42 days of 15-minute data.



ORION Cellular C endpoint (pictured)

Output Message: ORION Cellular water endpoints broadcast a unique serial number, meter reading data, and applicable status indicators. As an advanced data security measure, each message is securely transported to BEACON SaaS only via private network and never over the public internet.

APPLICATION

Configurations: ORION Cellular water endpoints are multi-purpose endpoints that can be deployed in indoor, outdoor and pit (non-metal pit lid) applications. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.

Meter Compatibility: When attached to a Badger Meter High Resolution Encoder, the ORION Cellular water endpoint is compatible with all current Badger Meter Recordall[®] Disc, Turbo Series, Compound Series, Combo Series and Fire Service meters and assemblies, and with E-Series G2[®] Ultrasonic, E-Series[®] Ultrasonic, E-Series[®] Ultrasonic Plus, and ModMAG[®] electromagnetic flow meters.

Encoder Compatibility: The ORION Cellular water endpoint is suitable for use with a Badger Meter High Resolution Encoder as well as the following Badger Meter approved three-wire encoder registers that have a manufacture date within 10 years of the current date as long as the encoder has three wires connected to it and is programmed into the three-wire output mode for AMR/AMI: Honeywell[®] (Elster) ScanCoder[®] encoder with Sensus[®] protocol module and evoQ4 meter (encoder output); Master Meter[®] Octave[®] Ultrasonic meter encoder output; Metron-Farnier Hawkeye; Mueller Systems 420 Solid State Register (SSR) LCD; Neptune[®] ProRead, E-Coder[®], ARB-V[®], and ProCoder; and Sensus iPerl[®].

SPECIFICATIONS

Dimensions	5.125 in. (130 mm) (H)
	1.75 in. (44 mm) Diameter at top 2.625 in. (W) x 2.875 in. (D) at base (67 mm (W) x 73 mm (D) at base)
Broadcast Network	LTE-M cellular network (primary communication technology)
	NB-IoT (secondary communication technology for certain variants)
RF Message for Troubleshooting	Where available (see table below) frequency is FCC-regulated 902...928 MHz frequency hopping modulation
Operating Temperature Range	• Storage, Meter Reading and RF Message (for troubleshooting) -40...60° C (-40...140° F)
	• Cellular Communications -20...60° C (-4...140° F)
Humidity	0%...100% condensing
Battery	One (1) lithium thionyl chloride D cell (nonreplaceable)

Construction: All ORION Cellular water endpoints are housed in an engineered polymer enclosure with an ORION RF board, battery and antenna. For long-term performance, the enclosure is fully potted to withstand harsh environments and to protect the electronics in flooded or submerged pit applications.

Wire Connections: ORION Cellular water endpoints are available with in-line connectors (Twist Tight® or Nicor®) for easy installation and connection to compatible encoders/meters. The endpoints are also available with flying leads for field splice connections. Other wire connection configurations may be available upon request.

License Requirements: ORION Cellular water endpoints comply with Part 15, Part 22, Part 24, and Part 27 of the FCC Rules. No license is required by the utility to operate an ORION meter reading system. This device complies with Industry Canada license-exempt RSS standard(s).

Transportation: **WARNING:** The operation of transmitters and receivers on airlines is strictly prohibited by the Federal Aviation Administration. As such, the shipping of radios and endpoints via air is prohibited. Please follow all Badger Meter return and/or shipping procedures to prevent exposure to liability.

Warning: To reduce the possibility of electrical fire and shock hazards, never connect the cable from the endpoint to any electrical supply source. The endpoint cable provides SELV low voltage limited energy power to the load and should only be connected to passive elements of a water meter register.

Caution: Endpoint batteries are *not* replaceable. Users should make no attempt to replace the batteries. Changes or modifications to the equipment that are not expressly approved by Badger Meter could void the user's authority to operate the equipment.

FEATURES

Smart City Ready	Future-proof technology
Communication Type	Two-way
Application Type	Control/Monitor
Endpoint Communication	Configurable call-in schedule, up to four times each workday
Reading Interval Type	15-minute
Encoder Compatibility	Absolute
Fixed Network Reading	✓
Cut-Wire Indication	✓
Encoder Error	✓
Low Battery Indication	✓
Remote Clock Synchronization	✓
Firmware Upgrades	✓

CONFIGURATIONS

Endpoint	Notes
ORION Cellular C	Includes RF and IR messages for troubleshooting
ORION Cellular CS	Secondary carrier; includes RF and IR messages for troubleshooting
ORION Cellular LTE-M	Includes RF and IR messages for troubleshooting
ORION Cellular LTE-MS	Secondary carrier; includes RF and IR messages for troubleshooting
ORION Cellular HLA	Includes IR message for troubleshooting

NOTE: For the ORION Cellular LTE-MP endpoint, see the *ORION Cellular LTE-MP Endpoint product data sheet*, available at www.badgermeter.com.

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APPENDIX D

CALCULATIONS

City of John Day
 Recycled Water Distribution "Purple Pipe" System

		Pipe size =					inch
		3	4	6	8	10	SF
Area =		0.049	0.087	0.196	0.349	0.545	
Flow Rate (gpm)	Flow Rate (cfs)	Velocity (fps)	Velocity (fps)	Velocity (fps)	Velocity (fps)	Velocity (fps)	
0	0.000	0.00	0.00	0.00	0.00	0.00	
50	0.111	2.27	1.28	0.57	0.32	0.20	
100	0.223	4.54	2.55	1.13	0.64	0.41	
150	0.334	6.81	3.83	1.70	0.96	0.61	
180	0.401	8.17	4.60	2.04	1.15	0.74	1 pump, 100%
200	0.446	9.08	5.11	2.27	1.28	0.82	
250	0.557	11.35	6.38	2.84	1.60	1.02	
300	0.668	13.62	7.66	3.40	1.91	1.23	
350	0.780	15.89	8.94	3.97	2.23	1.43	
360	0.802	16.34	9.19	4.08	2.30	1.47	2 pumps, 100%
400	0.891	18.16	10.21	4.54	2.55	1.63	

Proposed Pumps	Design Q (gpm)	Notes
Duty 1 =	180	VFD, maintain constant pressure in distr. Pipe
Duty 2 =	180	VFD, maintain constant pressure in distr. Pipe
Standby 1 =	180	VFD, maintain constant pressure in distr. Pipe

Typical flow range = 0 gpm - 360 gpm

APPENDIX E

CROSS-CONNECTION CONTROL ORDINANCE

CHAPTER 6 CROSS-CONNECTION CONTROL

7-6-1: PURPOSE:

The purpose of this Chapter is:

- A. To protect the public potable water supply of the City from the possibility of contamination or pollution by isolating, within the customer's internal distribution system(s) or the customer's private water system(s), such contaminants or pollutants which could backflow into the public potable water system(s) and;
- B. To promote the elimination or control of existing and future cross-connections, actual or potential, between the customer's in-plant potable water system(s) and non-potable water system(s), plumbing fixtures and industrial piping system(s) and;
- C. To comply with Oregon administrative rules for public water systems pertaining to cross-connection control requirements.

7-6-2: DEFINITIONS:

AWWA: American Water Works Association.

AIR GAP: The physical vertical separation between the free flowing discharge end of a potable water supply pipeline, faucet or fixture and the overflow rim of an open or non-pressure receiving vessel (tank). Physical separations must be at least twice the diameter of the inlet pipe, but never less than one inch. An approved air gap if properly maintained may be installed where the substance which could backflow is hazardous to health.

APPROVED: Accepted by the Oregon State Health Division and the City as meeting an applicable specification stated or cited in this Chapter.

AUXILIARY WATER SUPPLY: Any supply of water used to augment the supply of water obtained from the public water supply which serves the premises in question. These auxiliary waters may include, but are not limited to, wells, springs, rivers or "used waters" that have originated from the public water supply and have deteriorated in quality. These waters may be contaminated or polluted and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

BACKFLOW: The reversal of the normal direction of flow of water caused by either back pressure or back siphonage.

BACK PRESSURE: The flow of water or other liquids, mixtures or substances under pressure into the distribution pipes of a potable water supply system from any source other than the intended source. Booster pumps, elevated tanks, boilers or other means may result in a pressure greater than the supply pressure.

BACK SIPHONAGE: The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply from any source other than the intended source caused by the reduction of pressure in the public water supply system. Breaks in water mains, low water main pressure due to high demand, and firefighting are causes of back siphonage.

BACKFLOW PREVENTER: An assembly, device or means designed to prevent backflow of water, liquid, mixtures or substances. The term "approved backflow prevention assembly" shall mean an assembly that has been manufactured in full conformance with the standards established by the AWWA and approved for use in Oregon by the State Health Division.

CITY: The City of John Day, Oregon.

CITY WATER SYSTEM (also referred to as public water system): All or any part of the facilities for transporting, storing, pumping, treating, distributing or providing water to water service connections and servicing fire hydrants.

CONTAMINATION: An impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which create an actual or potential hazard to the public health through exposure to disease organisms or substances which may cause harmful physiological effects.

CROSS-CONNECTIONS: Any physical connection or arrangement of piping or fixtures between two otherwise separate piping systems one of which contains potable water and the other non-potable water or industrial fluids through which or because of which backflow may occur into the potable water system, whether such can be separated by a valve(s) or not. Bypass connections, jumper connections or any other plumbing arrangements in which it is possible to introduce into any part of the potable water system any polluted or contaminated water, fluid or substance are considered cross-connections.

CUSTOMER: Any person, firm or corporation granted water service by the City.

CUSTOMER LINE: The extension of pipe, valves and fittings leading from the water meter into the premises served.

CUSTOMER SYSTEM: All or any part of the network of pipes, fixtures and plumbing for distributing water on the premises being served past the utility systems meter.

DOUBLE CHECK VALVE ASSEMBLY (DCVA): An assembly of two independently acting check valves with shutoff valves on each side of the check valves and test cocks for testing the water tightness of each check valve. This assembly is designed for low hazard applications.

HAZARD: The term is derived from the evaluation of the potential risk to public health and the adverse effect of the hazard upon the public water system. The degree of hazard is referred to as low hazard, moderate hazard and high hazard.

POLLUTION: The presence of any foreign substance (organic, inorganic, radiological, physical or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness or quality of the water to a degree which adversely and unreasonably affect such waters for domestic use.

PREMISES: Any building, structure, improvement or parcel of land which now or some future time receives water service from the City.

REDUCED PRESSURE ZONE BACKFLOW PREVENTER (RPZ): An assembly for preventing backflow which has two independent check valves, a differential relief valve located between the two check valves, two shut-off valves, one on the upstream side and one on the downstream of the check valves, and four test cocks for testing the watertightness of the check valves and the operation of the relief valve. This assembly is designed for high hazard applications.

VACUUM BREAKERS: Two types of vacuum breakers are the atmospheric type (AVB) and the pressure type (PVB). The difference between the two devices is that the pressure vacuum breaker is spring loaded to assist the device in opening. Both devices open the pipeline to atmosphere in the event of back siphonage conditions only. Neither device is approved for back pressure conditions. Their primary purpose is to protect the water system from cross-connections due to submerged inlets, such as irrigations systems and tank applications. Shut-off valves cannot be installed downstream of atmospheric devices but can be on pressure devices. The devices must be installed above the highest downstream piping.

WATER, NONPOTABLE: Water which is not safe for human consumption or which is of questionable potability.

WATER, POTABLE: Any water which according to State Health and Federal Standards is safe for human consumption.

WATER PURVEYOR: The owner or operator of the public potable water system supplying water for public use.

WATER SERVICE CONNECTION: The terminal end of the City water system to which a water meter is attached (i.e., where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the customer's water system). There shall be no unprotected take offs from the service line ahead of any water meter. Service connections shall also include all other temporary or emergency water service connections from the City water system.

WATER USER: Any person using any part of the City water system.

7-6-3: RESPONSIBILITY TO MAINTAIN WATER SYSTEM:

- A. Water System: The water system shall be considered made up of two parts: the utility system and the customer system.
- B. City to Maintain Utility System: The City shall maintain the utility system facilities which include sources, storage, transmission and distribution mains and service lines and supply potable water to the service connection (point of delivery) of quality meeting the requirements of the Oregon State Health Division and the National Safe Drinking Water Act PL 93-523 or its successor.
- C. Water User to Maintain Customer System: The customer system, including the plumbing system(s) within their premises beginning at the utility or system meter, shall be maintained by the water user, and not give cause for any contaminants or pollutants to be introduced that could backflow or back siphon into the public potable water system.
- D. Backflow Prevention Device: If, in the judgment of the City's designated representative, an approved backflow prevention assembly is required at the customer's water service connection or within the customer's private water system for the protection of the public potable water system due to the backflow/back siphonage potential of contaminants or pollutants, the City's designated representative shall give notice in writing to said customer to install such approved assembly(s) at the customer's own expense; and failure, refusal or inability on the part of the customer to install, have tested and maintain said assembly(s) shall constitute a ground for discontinuing water service to the premises until such requirements have been satisfactorily met.

7-6-4: POLICY:

- A. Discontinuance of Service: No water service connection to any premises shall be installed or maintained by the City unless the public water supply is protected as required by State laws and regulations and the provisions of this Chapter. Service of water to any premises shall be discontinued by the City if a backflow prevention assembly required by this Chapter is not installed, tested and maintained, or if it is found that a backflow prevention assembly has been removed, bypassed, or if an unprotected cross-connection exists on the premises. Service will not be restored until such conditions or defects are corrected.
- B. Inspections: The customer's system should be open for inspection at all reasonable times to authorized representatives of the City to determine whether cross-connections or other structural or sanitary hazards exists. When such a condition becomes known, the City shall deny or immediately discontinue water service to the premises by provided for a physical break in the service line until the customer has corrected the condition(s) in conformance with State and City statutes relating to plumbing and water supplies and the regulations adopted pursuant thereto.
- C. Installation of Approved Backflow Prevention Assembly: An approved backflow prevention assembly(s) for protecting the public water system shall be installed at or near the service connection or immediately inside

the building being served or at the appropriate location upon the approval of the City's designated representative to premises whenever the following conditions exists:

1. There is an auxiliary water supply which is or can be connected to the public water supply. Such auxiliary supply shall be considered connected to the public water supply unless there be a physical break in the piping between such separate water supply and the public water supply.
2. There is piping for conveying liquids other than potable water, and where that piping is under pressure and is installed and operated in a manner which could cause a cross-connection.
3. There is intricate plumbing and piping arrangements, or where entry to all portions of the premises is not readily accessible to ascertain whether or not dangerous cross-connections exist.
4. There are fire protection systems connected to the public water system that are interconnected with an unapproved water supply, pipe material not approved for potable water use, where chemical additives and antifreeze compounds that may be toxic are used, or where stagnant waters that have deteriorated could backflow into the public water system.
5. There are underground sprinkler/irrigation systems that could let water contaminated by weed killers and fertilizers be back siphoned (backflow) into the public water system.
6. There are sprinkler/irrigations systems that provide for chemical injection.
7. There is back siphonage potential.
8. Cross-connections or potential cross-connections exist.

7-6-5: REQUIREMENTS:

- A. **Approved Type of Assembly:** All backflow prevention assembly(s) required by the Oregon State Health Division and this Chapter shall be of a type and model approved by the Health Division and are commensurate with the degree of hazard which exists.
- B. **Existing Installations:** All presently installed assemblies which do not meet the requirements of this Section, but were approved assemblies for the purposes described herein at the time of installation and which have been properly maintained, shall, except for the inspection and maintenance requirements under subsection 7-6-7A be excluded from the requirements of these rules so long as they satisfactorily protect the public water system. Whenever the existing assembly is moved from the present location or requires more than minimum maintenance or constitutes a hazard to public health, the unit shall be replaced by a backflow prevention assembly meeting the requirements of this Section.

7-6-6: INSTALLATION:

- A. **Assembly not to be Submerged:** No part of the backflow prevention assembly shall be submerged in water or installed in a location subject to flooding. If installed in a vault or basement, adequate drainage shall be provided.
- B. **Protection from Freezing:** The assembly must be protected from freezing and other severe weather conditions.
- C. **Manufacturer's Installation Instructions:** All assemblies shall be installed according to the manufacturer's installation instructions and the "Accepted Procedure and Practice in Cross-Connection Control Manual" published by the Cross-Connection Control Committee, Pacific Northwest Section, AWWA. Only assemblies specifically approved by the City's designated representative for vertical installation may be installed vertically.

-
- D. Minimum Clearance Specifications: All assemblies shall be readily accessible with adequate room for maintenance and testing. The minimum clearance specified by the manufacturer's installation instructions shall be closely followed.
 - E. Installation Kept on File: Upon completion of installation, the City shall be notified and all backflow protection assemblies inspected by the City's designated representative. Each backflow prevention assembly shall be kept on file with the City. The file shall consist of date of installation, location, make, model, size and serial number of the assembly and initial test report.
 - F. Pipe Joints: All pipe joints shall be restrained.
 - G. Assembly Tested: The assembly shall be tested upon installation by a State of Oregon certified tester and at least annually thereafter.

7-6-7: TESTING:

- A. Water User to Have Inspections; User's Expense: It shall be the responsibility of the customer user at any premises where backflow prevention assemblies are installed to have certified inspections and operational tests made at least once per year. In those instances where the City's designated representative deems the hazard to be great enough he may require certified inspections at more frequent intervals. These inspections and tests shall be at the sole expense of the water customer user. The customer user shall notify the City in advance when tests are to be undertaken so that an official representative of the City may witness the tests if so desired. The repair, overhaul or replacement of any assemblies found defective shall be at the sole expense of the customer user. The results of such testing shall be forwarded to the Oregon State Health Division and the City within ten days of the date of installation and 30 days of the anniversary date for the annual testing.
- B. Failure to Test Assemblies: If a water customer user fails to have such tests performed as required by subsection 7-6-7A the City may upon written notification within ten days, order such required tests be performed by a certified tester and all costs added to the customer user's water bill.

(Ord. No. 89-58-5, 5-23-89)

APPENDIX F

RECYCLED WATER BENEFICIAL PURPOSES TABLE

Recycled Water Beneficial Purposes

Beneficial Purpose	Class A	Class B	Class C	Class D	Nondisinfected
Irrigation					
Fodder, fiber, seed crops not intended for human ingestion, commercial timber	Yes	Yes	Yes	Yes	Yes
Firewood, ornamental nursery stock, Christmas trees	Yes	Yes	Yes	Yes	No
Sod	Yes	Yes	Yes	Yes	No
Pasture for animals	Yes	Yes	Yes	Yes	No
Processed food crops	Yes	Yes	Yes	No	No
Orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil	Yes	Yes	Yes	No	No
Golf courses, cemeteries, highway medians, industrial or business campuses	Yes	Yes	Yes	No	No
Any agricultural or horticultural use	Yes	No	No	No	No
Parks, playgrounds, school yards, residential landscapes, other landscapes accessible to the public	Yes	No	No	No	No
Industrial, Commercial, or Construction					
Industrial cooling	Yes	Yes	Yes	No	No
Rock crushing, aggregate washing, mixing concrete	Yes	Yes	Yes	No	No
Dust control	Yes	Yes	Yes	No	No
Nonstructural fire fighting using aircraft	Yes	Yes	Yes	No	No
Street sweeping or sanitary sewer flushing	Yes	Yes	Yes	No	No
Stand alone fire suppression systems in commercial and residential buildings	Yes	Yes	No	No	No
Non-residential toilet or urinal flushing, floor drain trap priming	Yes	Yes	No	No	No
Commercial car washing	Yes	No	No	No	No
Fountains when the water is not intended for human consumption	Yes	No	No	No	No

Beneficial Purpose	Class A	Class B	Class C	Class D	Nondisinfected
Impoundments or Artificial Groundwater Recharge					
Water supply for landscape impoundments including, but not limited to, golf course water ponds and non-residential landscape ponds	Yes	Yes	Yes	No	No
Restricted recreational impoundments	Yes	Yes	No	No	No
Nonrestricted recreational impoundments including, but not limited to, recreational lakes, water features accessible to the public, and public fishing ponds	Yes	No	No	No	No
Artificial groundwater recharge	Yes	No	No	No	No