APPROVED

Recycled Water Use Plan

Metropolitan Wastewater Management Commission (MWMC)

Metropolitan Wastewater
MANAGEMENT COMMISSION

partners in wastewater management

November 2021

Contents

Appendices

Tables

Figures

Section 1

Introduction

The Metropolitan Wastewater Management Commission - Eugene/Springfield Water Pollution Control Facility Recycled Water Use Plan describes the intended use and operation of Recycled Water. The plan has been written to comply with all the requirements of OAR 340 Division 55.

The objectives of this plan are to:

- Provide the Department of Environmental Quality (DEQ) with the required information on the origin and fate of the Recycled Water from the Metropolitan Wastewater Management Commission (MWMC) Eugene/Springfield Water Pollution Control Facility (E/S WPCF).
- Facilitate land application of Recycled Water with minimum environmental and health risk.
- Provide Recycled Water application site and site management information.
- Describe the format and content of an annual monitoring report.

Once approved by DEQ, this plan will remain in effect until additional reuse facilities, process changes, or end uses are developed by the MWMC. The E/S WPCF will initiate updates to the plan as it deems necessary or upon request by DEQ.

The goals of using Recycled Water from the E/S WPCF include:

- Providing supplemental water supplies for crop irrigation.
- Supplementing water supplies for current or future facility operations, including providing water to external parties.
- Providing potential temperature management benefits.

The benefits of using Recycled Water include:

- Reducing the amount of treated effluent discharged from the E/S WPCF into the Willamette River to help improve water quality.
- Conserving fresh water resources by replacing the fresh water source that would normally be used for irrigation and facility operation.
- Reducing the need for inorganic fertilizers for crops as nutrients in the Recycled Water will replace some of the nutrients in fertilizers.

System Overview:

The E/S WPCF treatment process is advanced secondary activated sludge with biological nutrient removal and anaerobic digestion. Following primary and secondary treatment, the effluent is chlorinated (disinfected) and de-chlorinated before discharge into the Willamette River. Recycled water is drawn off prior to de-chlorination and used as Class D recycled water.

Wastewater treated and discharged from the E/S WPCF complies with the treatment standards as dictated by the National Pollutant Discharge Elimination System (NPDES) Permit issued by the Oregon DEQ and Class D recycled water standards.

Recycled water is pumped from the E/S WPCF to the Biosolids Management Facility (BMF) and Biocycle Farm, located at 29689 Awbrey Lane, Eugene, Oregon, through a 5.5 mile force main.

The Recycled water line surfaces at the BMF and can be directed to a booster pump for use as process water for the dewatering operation or directed to the Reuse pump station located at the BMF and onto the Biocycle Farm through a 5.5 mile force main. Recycled water can be routed to any of 156 riser valves which are connection points for any of 10 Hard Hose Reel irrigators. The hose reel irrigation carts are extended up to 1450 feet with farm tractors and reeled in at controlled speeds to supply the desired irrigation application rates.

The irrigation conveyance and application equipment are designed to distribute both Recycled Water (regulated under OAR Chapter 340, Div. 55) and liquid biosolids (regulated under OAR Chapter 340, Div. 50) through the same equipment and distribution lines to the Biocycle Farm. Each activity will be operated, managed, and regulated under the requirements of the E/S WPCF NPDES Permit and operated under Oregon DEQ approved operational plans.

The irrigation conveyance and distribution system will be flushed with recycled water after each biosolids land application activity, and prior to monitoring and recordkeeping activities associated with Recycled Water Reuse application.

Section 2

Wastewater Processing

2.1 Overview of Existing Facility

The facility's average design dry weather flow is 49 million gallons per day (MGD) which is the current rated capacity in the E/S WPCF's National NPDES Permit. The Design Average Wet Weather Flow (DAWWF) is 68 MGD and the treatment plant is rated for a 277 MGD hydraulic peak hour flow (MWMC Partial Facilities Plan Update (PFPU), CH2MHill, June 2014). Actual flows during the 2020 dry season averaged 23.7 MGD and during the 2020 – 2021 wet season averaged 37.3 MGD. The origin of the wastewater processed is approximately 97 percent domestic, 2.9 percent industrial, and 0.01 percent from mobile waste haulers that primarily haul septage waste.

The facility receives and treats wastewater from Eugene, Springfield, and areas of Lane County. The existing treatment processes at the facility consist of pretreatment, primary treatment, secondary treatment, final treatment, and sludge processing. Figure 2.1-1 shows the location of each of the regional wastewater treatment facilities. The E/S WPCF process diagram of the facility is shown in Figures 2.1-2.

Figure 2.1-1

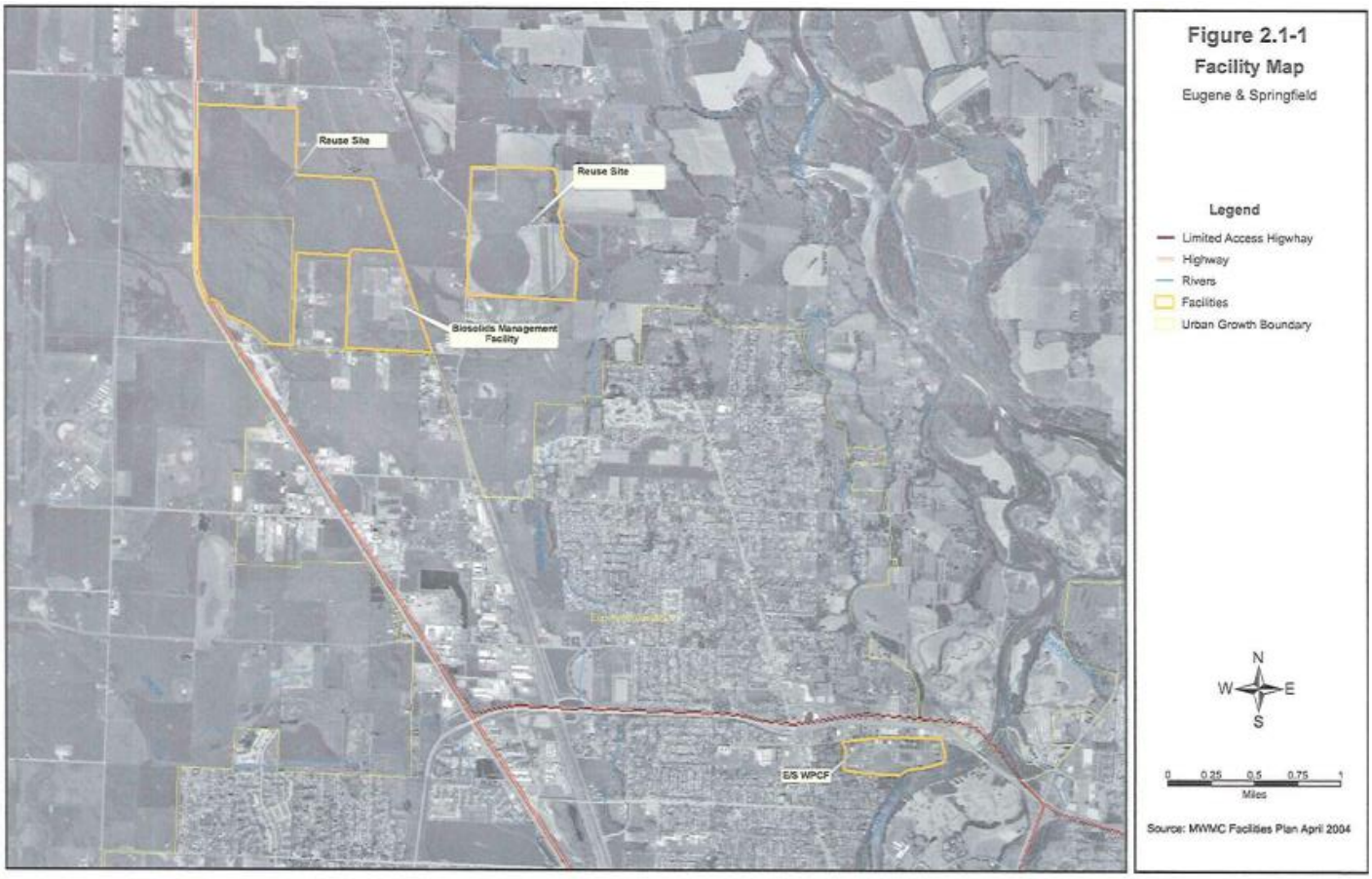
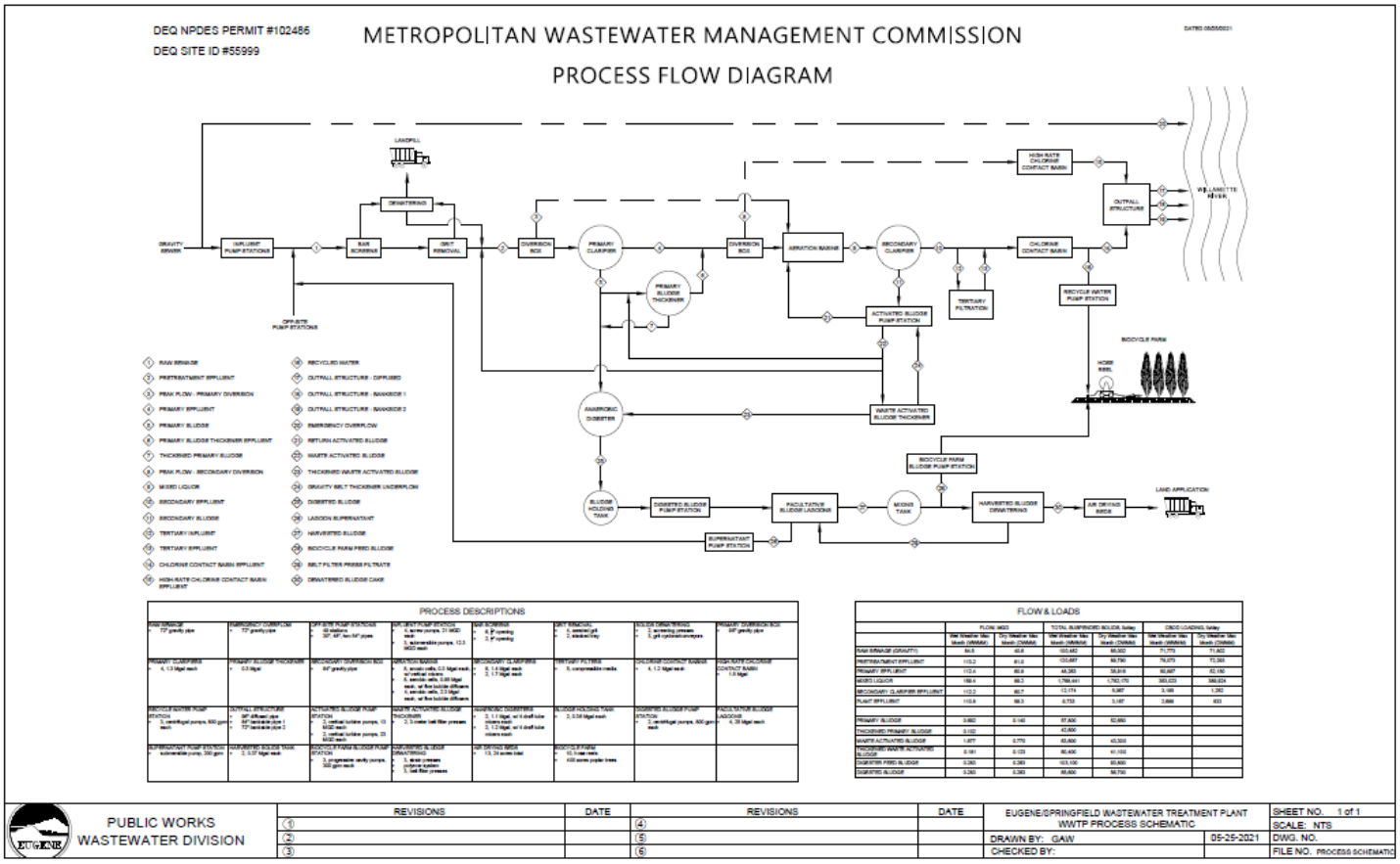


Figure 2.1-2



2.2 Facilities Planning

The approved 2014 MWMC PFPU provides an analysis of the critical wastewater treatment process capacities relative to estimates of influent flows and loads as well as recent and anticipated regulatory changes. While not a comprehensive planning document, the information developed in the PFPU is intended to provide a technical basis for planning decisions.

The Recycled Water Plan will be updated as necessary to reflect any changes in wastewater treatment and the end uses of Recycled Water.

2.3 Current Treatment Plant Processes

2.3.1 Pretreatment

Raw sewage enters the pretreatment facility where sand, debris and other solids not suitable for downstream treatment are removed. In addition, the wastewater is aerated to remove odorous gases. Screenings and grit are dewatered in a separate building through screenings washer/compactors and grit separation.

2.3.2 Primary Treatment

The pretreatment effluent then flows into primary clarifiers to remove sludge and scum from the wastewater. There are four clarifiers which remove approximately 60 percent of the solids in the waste stream. Each clarifier receives effluent from the facility's pretreatment system through a 60 inch diameter pipe. Each clarifier has 41.25 MGD capacity (for 165 MGD total). Primary sludge is thickened to 4 to 5 percent solids at the bottom of the clarifier and then pumped to any of four anerobic digesters.

2.4 Processes Specific to the Production of Disinfected Class D Recycled Water

2.4.1 Secondary Treatment

The E/S WPCF has a total of eight activated sludge basins to provide biological secondary treatment. There are four fine bubble aeration basins with two anoxic cells per basin, and four additional fine bubble aeration basins. They can be operated in complete mix, plug flow, step feed, or contact stabilization modes. The aeration basins are primarily operated in step feed mode. When flows exceed 100 MGD, contact stabilization is used. The sludge retention time is between 7 and 9 days.

The aeration basin effluent flows into the secondary clarification process. There are ten secondary clarifiers with a total capacity of 167 MGD. Each clarifier contains a rapid sludge removal (RSR) mechanism that draws return sludge from the bottom of the clarifier. Secondary scum is also removed from the surface of the clarifier and flows to the secondary scum pump station. The return sludge flows by gravity to the return activated sludge (RAS) pump station where the RAS is then distributed back to the aeration basins. The waste activated sludge (WAS) flows by gravity to the Gravity Belt Thickener (GBT) and then on to anaerobic digesters.

2.4.2 Disinfection

From the secondary clarification process, the wastewater discharges to the Final Treatment Facility for disinfection. Sodium hypochlorite is injected into the influent of the Final Treatment Facility through a diffuser located just prior to the chlorine contact basins. There are four chlorine contact basins. The current disinfection capacity is estimated at 175 MGD. Following chlorine injection, the flow passes through the basins to achieve the desired detention time.

At the end of the contact chamber, the Recycled Water is pumped by one of three Recycled Water pumps to the BMF as Disinfected Class D Recycled Water that meets secondary treatment standards, for use as process water in the dewatering operation and as the primary irrigation source for Biocycle Farm.

After the wastewater has been de-chlorinated with Sodium Bisulfite, the treated wastewater is discharged into the Willamette River at River Mile 178.

Section 3

General Information

3.1 Alarm System

The E/S WPCF is monitored 24 hours a day, 7 days a week and has alarms on all equipment vital to processes throughout the plant. Alarms specific to the Recycled Water System include the following:

- Cl_2 Leak Alarm
- Cl_2 empty, not feeding
- W2 Pump System Failure
- Power Fail

3.2 Redundant Systems

The E/S WPCF has sufficient redundancy (including power back-up) and auxiliary facilities required to achieve compliance with the conditions of the NPDES permit. Plant operation personnel will monitor the Recycled Water System via the Distributed Control System (DCS) running advanced process control software which is operated from either the main operation control center or wireless tablets anywhere in the facility.

Providing Recycled Water is a secondary priority to treatment and discharge to the Willamette River, and if wastewater treatment is disrupted for any reason, the Recycled Water system can be shut down without environmental or public health consequences until recycled water system operation can be resumed.

3.3 Safety Precautions

All staff involved in the operations and maintenance of the Recycled Water System are informed of the potential presence of pathogenic organisms. Staff are advised of general safety precautions such as the need to avoid inhalation and ingestion. Wash up and sanitary facilities will be provided to staff for use in-the-field. Showers and additional sanitary facilities are available at the BMF.

Personal protective equipment, such as rain gear, gloves, clothing, boots, and face shields are provided and made available as necessary. These precautions are common to most agricultural practices.

3.4 Restricted Access

Unauthorized site access is prevented through the use of physical barriers, signage, and site management practices.

The main entrance to the Biocycle Farm is through the Biosolids Management Facility. Signage is posted at the entrance of the BMF that instructs all visitors to stop and report to the main office. Signage at the entrance to the Biocycle Farm indicates the use of Recycled Water, and informs regional staff of the use of Recycled Water, No Drinking. The BMF is fenced, gated, and is locked and secured when unattended.

Informational signage indicating *No Trespassing*, the use of *Recycled Water*, and *Do Not Drink* is posted every 500 ft. along the length of the perimeter fencing. A fence with a minimum height of 4 feet has been constructed along the property line of the Biocycle Farm.

All gates on the site are locked and posted with *No Trespassing* signs.

3.5 Site Specific Information

Name: MWMC Eugene/Springfield Water Pollution Control Facility
Mailing Address: 410 River Avenue, Eugene, Oregon 97404

Biocycle Farm Location Address: 29689 Awbrey Lane, Eugene, Oregon 97402

Legal Description: Township 16, Range 4, Section 34 WM

Telephone: (541) 682-8660
Contact: Randy Gray, Residuals Supervisor

The Biocycle Farm site is located adjacent to, and northwest of, the MWMC Eugene/Springfield Biosolids Management Facility.

Section 4

Effluent Reclamation System

4.1 Effluent Reuse Regulations

The standards for effluent reuse in Oregon are established by DEQ through OAR 340-55 (see Appendix A for a complete copy of the regulations).

4.2 Treatment and Monitoring Requirements

Through OAR 340-55, the DEQ established treatment and monitoring requirements for potential agricultural and nonagricultural uses of treated effluent. The DEQ has classified recycled water into four categories and designated a minimum degree of treatment required. Table 4-1 lists the four categories and associated requirements.

Table 4-1 Reuse Category Class
Minimum Degree of Treatment Required

Water Quality Parameter	A Must be oxidized, filtered, and disinfected	B Must be oxidized and disinfected wastewater	C Must be oxidized and disinfected wastewater	D Must be oxidized and disinfected wastewater
E.coli (#/100 mL)				
30 day log mean				126
Maximum in single sample				406
Total Coliform (#100) 7 day-median	2.2	2.2	23	
And in any two consecutive samples.		23	240	
Any single sample	23			
Turbidity (NTU)				
24-hour mean	2	No limit	No limit	No limit
5% of the time during any 24-hour period	5	No limit	No limit	No limit
At any time	10			
Minimum Monitoring Requirements				
E.Coli				Once/week
Total Coliform	Daily	Three times/week	Once/week	
Turbidity	Hourly			

* From OAR 340-55

Additional system monitoring and recordkeeping requirements are detailed in Section 12.

4.3 Recycled Water Characteristics

The results for effluent quality analysis by the E/S WPCF are presented in Table 4-2.

Table 4-2 Recycled Water Characteristics

Historical Data Set Includes **Months: May through October; Years: 2010 through 2020**						
***Plant Effluent Analyte**	**Mean**	**Median**	**Min**	**Max**	**Reporting Limit**	**Units**
Ammonia - as Nitrogen	7.7	7.2	1.4	20	0.1	mg/L
Carbonaceous Biochemical Oxygen Demand	4	3	<2	2	2	mg/L
Residual Chlorine	0.31	0.28	0.19	0.70	0.02	mg/L
Escherichia coli	7	3	<1	230	1	colonies/100 mL
Escherichia coli (Log Mean of Resamples)	15	16	3	24	1	colonies/100 mL
Nitrate + Nitrite - as Nitrogen	6.7	6.5	1.8	13	0.02	mg/L
Total Kjeldahl Nitrogen	9.7	9.0	3.4	21	0.2	mg/L
pH	7.06	7.10	6.20	8.30	N/A	Units
Phosphorus – Total	2.4	2.2	0.22	6.8	0.01	mg/L
Total Suspended Solids	6	6	2	62	1	mg/L
Calcium – Total	16	16	13	26	1	mg/L
Magnesium – Total	5.4	5.5	3.6	8.2	0.5	mg/L
Hardness	63	62	50	90	5	mg/L
*Data values recorded as less than the Reporting Limit were analyzed as one-half the reporting limit; statistic shown as censored result (i.e., "<") if computed value is less than Reporting Limit.						

Section 5

Recycled Water Conveyance and Distribution

Three Recycled Water pumps located at the E/S WPCF are used to pump Recycled Water for various processes and other uses throughout the plant. One pump is the lead pump, one is a lag pump, and one pump is a redundant (back-up) pump. The redundant Recycled Water pump has been designated as the primary pump for providing Recycled Water to the BMF. In the event the lead, or lag pump fails, the redundant pump is placed into service and is not used for Recycled Water for the duration of the outage.

5.1 Recycled Water Conveyance System

The primary purpose of the Recycled Water Conveyance System (RWCS) is to convey Recycled Water from the Recycled Water pump station at the E/S WPCF to the BMF for use in the following operations:

1. Irrigation of Recycled Water to the Biocycle Farm
2. Wash water for the belt filter presses (BFP) at the BMF Dewatering Facility

The RWCS as described herein includes equipment, piping, and instrumentation and controls between an existing Recycled Water pump at the E/S WPCF and the BMF. The Recycled Water Conveyance System consists of the following components:

- Recycled Water (W-2) pump at the WPCF (1)
- 16-inch pipeline (RWCP) between the WPCF and the BMF
- Butterfly valves (3)
- Surge relief valve (1)
- Double check valve (1)
- Flow meters (2)
- Pressure indicator/transmitters (2)
- Isolation valves (plug valves)
- Air/vacuum valves (8)

Each of the above components is briefly described below.

5.1.1 Recycled Water (W-2) Pump

An pump at the Recycled Water pump station is used to pump Recycled Water from the E/S WPCF to the BMF. A Variable Frequency Drive (VFD) on the pump is used to control the speed of the pump. The pump discharge piping is configured to allow flow to be directed to either the BMF or the E/S WPCF.

The Recycled Water pump is capable of providing the maximum design flow of 2,800 gallons per minute (gpm). The new portions of the RWCP were designed for a maximum flow of 2,800 gpm and 150 psi. However, at 2,800 gpm pressure will exceed the pressure rating of the combined pipeline. It is estimated that a maximum flow of 1,950 gpm can be conveyed to the BMF without exceeding the pressure rating of the conveyance line. The speed of the Recycled Water pump will be limited to keep the operating pressure in the existing combined pipeline below 100 psi measured at a pressure transmitter on the RWCP at the E/S WPCF.

5.1.2 Recycled Water Conveyance Pipeline

The RWCP is approximately 27,000 feet of 10-inch and 16-inch pipe between the Recycled Water pump station at the E/S WPCF and the Reuse Mix Tank at the BMF. The RWCP is primarily composed of 16-inch (15.3-inch ID) polyvinyl chloride (PVC) pipe with a few short sections of HDPE pipe. The existing 10-inch PVC pipeline makes up approximately 11,200 feet of the RWCP. The RWCP connects to the existing pipeline at two locations, Northwest Expressway/Bushnell Drive and Prairie Road/Awbrey Lane. The above-grade portions of the RWCP are composed of ductile iron (DI) pipe.

5.1.3 Butterfly Valves

Two, 10-inch electronically actuated butterfly valves are located on the discharge header of the Recycled Water pump, and are used to direct flow to either the E/S WPCF or the BMF.

A 10-inch bypass pipe, and electronically actuated butterfly valve on the RWCP allow flows in excess of what is needed at the BMF to be discharged back to the WPCF chorine contact channel. The valve modulates, as needed, to meet the RWCP flow requirements.

5.1.4 Surge Relief Valve

An 8-inch surge relief valve located at the E/S WPCF, prevents over-pressurizing of the RWCP. The surge relief valve discharges to the 10-inch bypass pipe to the chlorine contact channel.

5.1.5 Double Check Valve

A 10-inch double check valve on the RWCP at the E/S WPCF prevents struvite cleaning water from reaching the Recycled Water pump and associated valves and instruments.

5.1.6 Flow Meters

Total flow to the BMF is metered with a 10-inch flow meter located above grade at the E/S WPCF. Flow to the Reuse Mix Tank is also metered with a 16-inch flow meter located above grade at the BMF. The difference in the two flow meters indicates the amount of flow being used for wash water on the Belt Filter Presses (BFPs). The measured flow rate for each flow meter is available through local readout at the instrument panel, the PLC Panelview display, and in the Operations control room.

5.1.7 Pressure Indicators/Transmitters

The pressure of the RWCP at the E/S WPCF is measured by a pressure indicator/transmitter located on the discharge header of the pump. A high pressure set point is used to limit the speed of the Recycled Water (W-2) pump to prevent over-pressurization of the RWCP. The measured pressure is available through local readout at the instrument panel, the PanelView display, and the Operations control room.

A pressure indicator/transmitter located on the above grade portion of the RWCP at the BMF, measures the RWCP pipeline pressure at the BMF. The pressure indicator/transmitter is used to control the speed of the Recycled Water (W-2) pump to provide the flow and pressure needed at the BMF. The measured pressure is available through local readout at the instrument panel, the PanelView display, and operations control room.

5.1.8 Isolation Valves (Plug Valves)

Numerous isolation valves are located on the RWCP between the WPCF and the Harvested Solids Storage Tanks (HSST) at the BMF. The following table lists each valve, its location, and function.

Table 5-1 Conveyance Line Valve Functions

Valve Location	Valve Tag Number	Function
NW Expressway/ Bushnell	33HV14-02	
Prairie Road/ Awbrey Lane	33HV14-03	
Prairie Road/ Awbrey Lane	33HV14-04	
Prairie Road/ Awbrey Lane	33HV14-05	When open, allows flow to go to the SIW facility
Irving Road/NW Expressway	33HV16-04	When open, allows flow to go between the WPCF and BMF; when closed isolates a portion of the RWCP for struvite cleaning

5.1.9 Air/Vacuum Valves

Eight Vent-O-Mat Series RGX air release and vacuum break valves are located at high points of the RWCP. Five of these valves are located on the new portion of the RWCP, and three of these valves are located on rehabilitated sections of the line. Each valve is located in a small vault or manhole.

5.2 Distribution

From the Reuse Pump Station, the Recycled Water is pumped through an irrigation supply pipeline. The 4.5 mile, 16-inch pipeline loop includes 156 4-inch risers with valves spaced throughout the farm in various management units. There is approximately one riser for every four tree rows in each management unit. Up to 10 hose reels may be connected at one time to any of these risers and operated simultaneously at a constant and equal flow rate of 250 gpm per hose reel, at 40 psi at the irrigation nozzles.

The pipeline is constructed in a continuous loop to ensure a constant and equal pressure and flow rate at each irrigation riser. The desired line pressure set point is monitored and regulated at the Reuse pump station by how many the pumps are on line (up to three), and the speed of each pumps, controlled through the use of variable frequency drives. The flow is monitored with magnetic flow meters and recorded to confirm calculated application rates.

5.3 Cross Connections

There is no potential for backflow/contamination with potable water since there are no cross connections to potable water systems.

5.4 Cross-connection Control System

The construction and marking of piping, valves and other portions of the Recycled Water system conform to requirements outlined in the "Guidelines for Distribution of Non-Potable Water" of the California-Nevada Section of the American Water Works Association, as revised September 14, 1983.

All exposed Recycled Water conveyance pipelines are painted purple to designate them as Recycled Water.

Section 6

Biocycle Farm - Types of Reuse

6.1 Irrigation

The Reuse of Recycled Water at the Biocycle Farm will include irrigation of Class D Recycled Water, as defined in OAR Chapter 340 - Division 55, to 395-acres of hybrid poplar trees, inter-planted between tree rows with annual or perennial grasses.

6.2 Process Water

Up to 400 gpm of Recycled Water can be used for process water at the BMF dewatering operation, supplying belt filter press wash water.

6.3 Plan Does Not Apply To Biosolids Land Application

This Plan does not apply to biosolids land application at the Biocycle Farm. Biosolids is managed and regulated through the E/S WPCF NPDES Permit and OAR Chapter 340 - Div. 50. The land application of biosolids on the Biocycle Farm is operated under a DEQ approved Biosolids Management Plan for the MWMC.

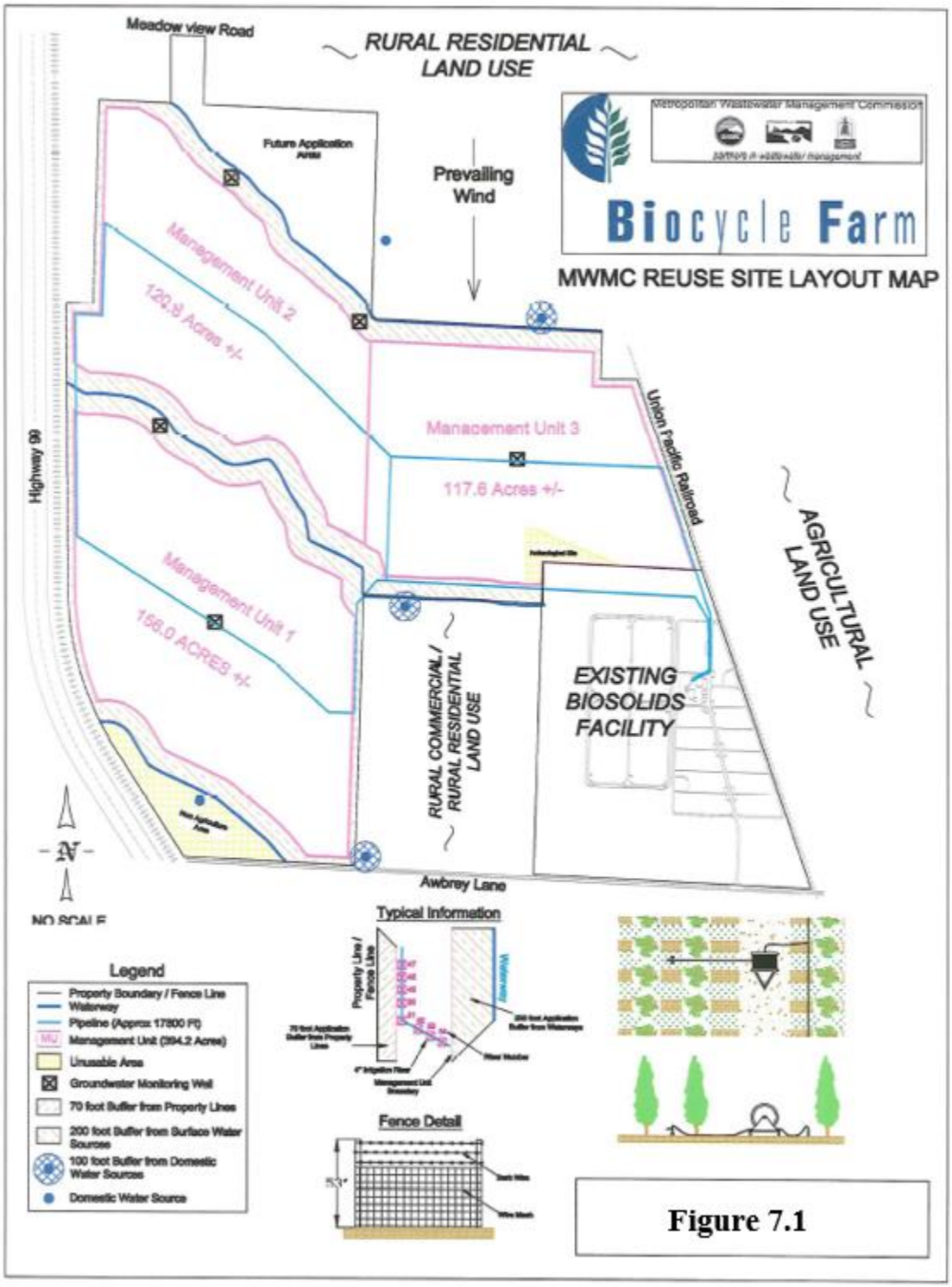
Section 7

Biocycle Farm - Site Characteristics

7.1 Planting Strategy

The Biocycle Farm is a hybrid-poplar tree plantation established to maximize the benefits of the application of Reuse Water and the land application of biosolids. This site includes Management Unit 1, which consists of approximately 156 acres. Management Unit 2 consists of approximately 122 acres. Management Unit 3 consists of approximately 117.6 acres (see Figure 7.1, Biocycle Farm MWMC Reuse Site Layout Map).

Nutrients in the form of nitrogen, are regulated through the E/S WPCF NPDES Permit Biosolids Management Plan, and site authorization letter. Nutrients supplied from the irrigation of Recycled Water is monitored and tracked with an operation spreadsheet, and included in the total nitrogen application calculations to maintain nutrient loadings at or below DEQ approved application rates (spreadsheet example is located in Appendix B).



7.2 Performance-Based Management

The Biocycle Farm will be managed adaptively on the basis of its performance. Biocycle Farm nutrient and hydraulic loadings will be reviewed by the MWMC staff and compared to regional silviculture data (OSU/WSU for instance). Loading rates may be adjusted based on monitoring results and reported through the annual report.

All hybrid poplar management units irrigated with recycled water will be managed for fiber production.

7.3 Topographic Characteristics

The site topography is relatively flat, ranging from 350-360 foot elevation. The site spans the watershed divide of two regional surface drainages. Therefore, little runoff is expected off-site, and any flooding should be limited to small areas immediately adjacent to the intermittent drainage ways on the site. Three ephemeral streams pass through the site. These seasonal streams drain the site and neighboring areas from the southeast to the northwest. 200 foot buffer zones have been provided for all streams.

Landslides or other slope instability are not an issue and runoff from the site can be easily prevented with proper management of application rates.

Application periods of Recycled Water will be restricted to the dry season (May-October), when major rainfall events are generally infrequent and of short duration. Application of Recycled Water will not be conducted on any saturated soils or flooded lands.

7.4 Climatic Data

Table 7-1 shows the historical average monthly temperatures, precipitation and typical prevailing wind direction for the Eugene/Springfield area. This data represents the climatic conditions for the Biocycle Farm.

Table 7-1 Historical Climate Data for Eugene, Oregon (1961-1990) ***National Weather Service, Portland Oregon***

Month	Average Maximum Temperature (F)	Average Minimum Temperature (F)	Average Precipitation (Inches)	Prevailing Wind Direction (From the)
January	46.4	35.2	7.9	South
February	51.4	37.0	5.6	South
March	55.9	38.9	5.2	South
April	60.5	40.6	3.1	South
May	67.1	44.5	2.2	North
June	74.2	49.7	1.4	North
July	81.7	52.3	0.5	North
August	81.8	53.2	1.1	North
September	76.2	49.3	1.7	North
October	64.6	43.5	3.4	South
November	52.4	39.7	8.3	South
December	46.2	35.9	8.6	South
Total			**49.0**	

7.5 Soils Analysis

A detailed soils evaluation was conducted by CH2MHill in 2000. The application site is comprised of approximately 596-acres of soils series complex (5-Awbrig silty clay loam, 31-Coburg silty clay loam, Holcomb silty clay loam). The silty clay loam should prevent rapid leaching of applied liquids.

The soils evaluation is consistent with the mapping unit descriptions of the soil survey (USDA/NRCS, 1987) and the Official Series Descriptions (OSD). A soil map of the Biocycle Farm is included in Figure 7.2.5-1. Map unit descriptions for soils according to the soil survey (USDA/NRCS1987) are summarized in Table 7-2.

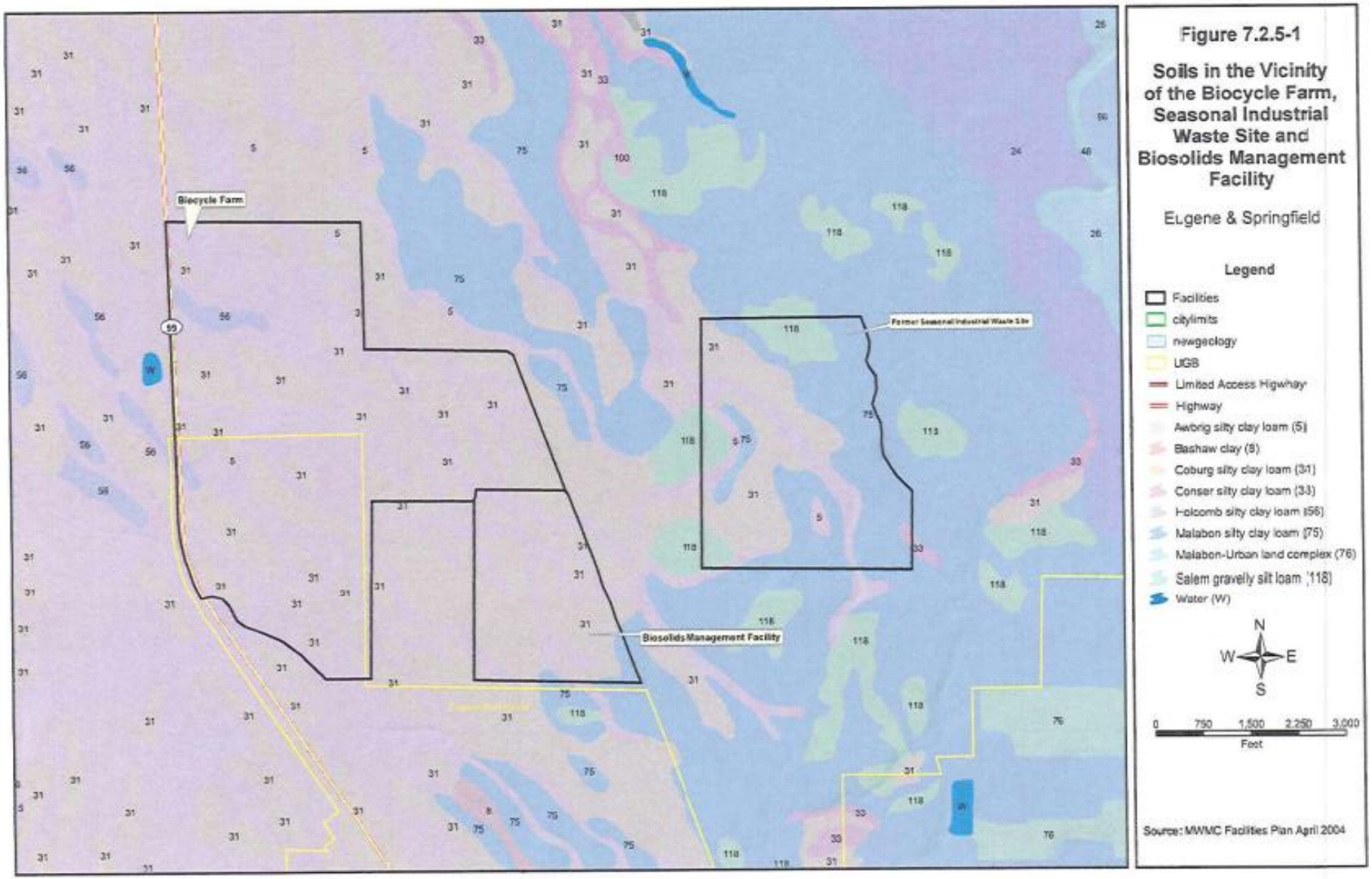

Biocycle Farm
Former Seasonal Industrial Waste Site
Biosolids Management Facility
Figure 7.2.5-1
Soils in the Vicinity of the Biocycle Farm, Seasonal Industrial Waste Site and Biosolids Management Facility
Eugene & Springfield
Legend
Facilities
citylimits
newgeology
UGB
Limited Access Highway
Highway
Awbrig silty clay loam (5)
Bashaw clay (8)
Coburg silty clay loam (31)
Conser silty clay loam (33)
Holcomb silty clay loam (56)
Malabon silty clay loam (75)
Malabon-Urban land complex (76)
Salem gravelly silt loam (118)
Water (W)
N
W
E
S
0 750 1,500 2,250 3,000
Feet
Source: MWMC Facilities Plan April 2004

Table 7-2 Mapping Unit Descriptions and Characteristics

Mapping Unit	Approximate Area (%)	Description and Characteristics*
5	69	**Awbrig silty clay loam- 0-2 percent slopes** • Poorly drained • Formed from mixed clayey and silty alluvium • Occurs on plane to concave areas on stream terraces and in drainageways • Surface is 7 inches of very dark graying brown silty clay loam is underlain by 22 inches of very dark gray clay and silty clay that is underlain by 19 inches of silty clay loam. The substratum is clay loam to a depth of 60 inches or more. • Permeability is very slow • Runoff is very slow • Erosion hazard is slight to none • Effective rooting depth for many crops is limited by high water table at a depth of 0 to 12 inches from November to May
31	38	**Coburg silty clay loam – 0 to 3 percent slopes** • Moderately well drained • Formed from silty and clayey mixed alluvium • Occurs on low stream terraces • Surface is 18 inches of very dark graying brown silty clay loam underlain by 35 inches of dark brown mottled silty clay loam and silty clay. The substratum to a depth of 65 inches or more is dark brown, mottled fine sandy loam. • Permeability is moderately slow • Runoff is slow • Erosion hazard is slight • Effective rooting depth is more than 60 inches • From November to May, water table is at 1.5 to 2.5 feet
56	2	**Holcomb silty clay loam – 0 to 3 percent slopes** • Poorly drained • Formed on stratified, silty and clayey alluvium • Occurs on valley terraces • Surface layer is very dark grayish brown and very dark brown silty clay loam about 10 inches thick; subsurface layer is mottled, very dark grayish brown silty clay loam about 9 inches thick • Permeability is very slow • Runoff is slow • Erosion hazard is slight • Effective rooting depth for many crops is limited by a high water table that is at a depth of 1 foot to 1.5 feet from November to May

* Information from the Soil Survey of Lane County, Oregon and the Official Series Descriptions.

7.6 Groundwater

The groundwater aquifer in this area is unconfined and is interconnected with surface water features. Movement of groundwater in the water table aquifer beneath the site is north-northwest (USGS, 1973). Groundwater levels on the site vary from approximately 6 to 25 feet below the surface during the dry season (approximately May through October). The groundwater level rises considerably during the wet season with depths to the water table in the range of 1 to 12 feet over most of the area by early spring.

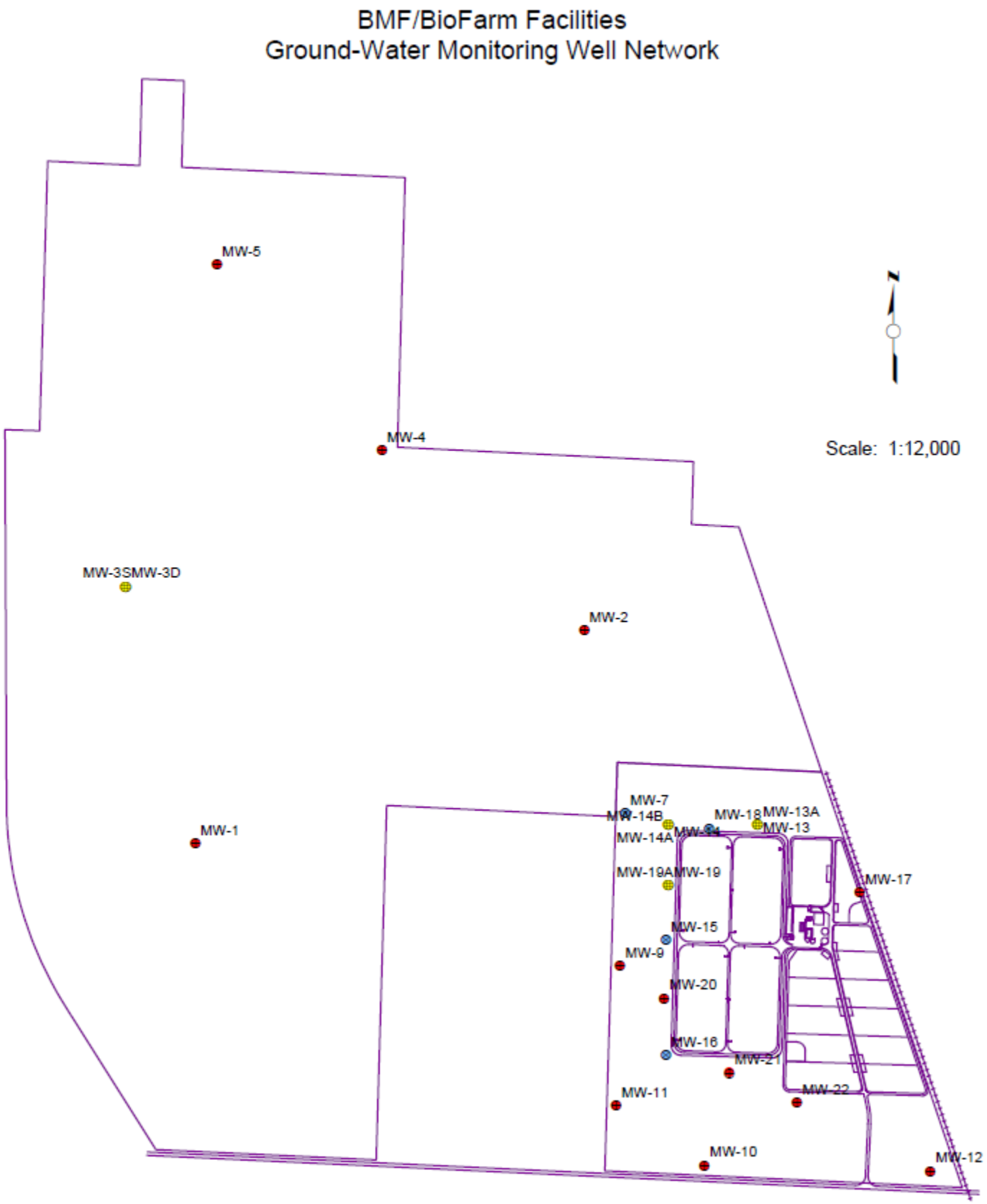
Depth to groundwater from on-site monitoring wells is detailed in Table 7-3. Location of monitoring wells is detailed in Figure 7.3

Table 7-3 Depth to Groundwater on Biocycle Farm during Irrigation Season

Data set: May 2010 to October 2020

Well #	Minimum Depth to Groundwater	Maximum Depth to Groundwater	Average Depth to Groundwater
	Feet	Feet	Feet
1	2.90	11.78	7.29
2	4.48	14.90	9.16
3S	2.94	9.85	5.12
3D	3.14	11.15	7.12
4	3.12	13.50	7.26
5	3.35	12.60	7.22

Figure 7.3


BMF/BioFarm Facilities
Ground-Water Monitoring Well Network
N
Scale: 1:12,000
MW-5
MW-4
MW-3SMW-3D
MW-2
MW-1
MW-7
MW-14B
MW-18
MW-13A
MW-13
MW-14A
MW-14
MW-19A
MW-19
MW-17
MW-15
MW-9
MW-20
MW-16
MW-21
MW-11
MW-22
MW-10
MW-12

7.7 Gross and Net Site Acreage

The gross acreage of the site is 596-acres. The net acreage that will receive Recycled Water is 395-acres. The difference in acreage is made up of setbacks, buffers, roadways, and set aside areas.

7.8 Irrigation Site Buffer Zones and Setbacks

Figure 7-1 details the buffers and setbacks

Property boundaries: The minimum distance from the irrigation area to the property boundary is 70-feet. Most of the site has a minimum of 100-foot setbacks from the irrigation area to the property boundaries. The 70-foot set back area, which is less than a few hundred feet in length, is located on the south west corner of the property, bordered by the union pacific rail line and state highway 99, directly to the west.

Surface water: A minimum 200-foot set back is maintained from the irrigated area to all permanent surface water drainage ditches.

Domestic wells: A minimum 100-foot set back is maintained from the irrigated area to all domestic water source wells.

Section 8

Annual Application Rates

8.1 Hydraulic Loading Rates

One of the goals of the wastewater Recycled Water Reuse program is to beneficially manage the use of treated effluent as a resource to showcase that wastes can, and should, be beneficially reused. Application of Recycled Water will be limited to the period of May through October as stipulated in the NPDES Permit for the E/S WPCF.

The gross irrigation requirements of grass and hybrid-poplars for the Biocycle Farm were provided by a CH2MHill study conducted for the MWMC (*Biosolids Land Application Farm and Site Feasibility and Conceptual Design*, April 2000). Table 8-1 summarizes the gross irrigation requirements of grass and poplars for the Willamette Valley Region. The net irrigation requirement for grass was obtained from the Oregon State University (OSU) report *Oregon Crop Water Use and Irrigation Requirements*, October 1992. This report utilizes the modified Blaney-Criddle water balance model to determine irrigation requirements. Water needs for the poplar trees and grass reuse system were developed and the results are presented in Table 8-1.

Evapotranspiration normally exceeds rainfall from April through October, drying the soil and increasing its capacity to store water. Initial operating strategy calls for deficit irrigation (typical irrigation rate is 9 inches/acre/year) practices at the site which will encourage deep rooting and the use of groundwater, minimizing the potential of leaching nutrients to groundwater. Deep percolation of some fraction of the Recycled Water mixed with rainwater will occur in the dormant season, but proper nitrogen management will minimize the amount of residual nitrogen remaining in the soil as the wet season begins.

The gross irrigation requirement is the total crop water demand adjusted for effective precipitation and irrigation efficiency. The net irrigation amount was calculated from the gross irrigation requirement with 85 percent efficiency.

The precipitation data used was 3 years of monthly data as recorded from the Eugene Airport. Effective precipitation for each month was estimated using a procedure developed by the Soil Conservation Service (Hydrological Engineering Inc., 1997)

The net irrigation requirement for grass was obtained from the Oregon State University (OSU) report *Oregon Crop Water Use and Irrigation Requirements,* October 1992, One- and- two-year old poplar tree water requirements were obtained from Gochis and Cuenca (1999), documenting results from seasonal hybrid polar plant water use in Boardman, Oregon. The combined irrigation requirement for poplars with a grass understory in the first two years was determined relative to the planting spacing and the mix of grass and 1- or 2-year-old poplar tree water use.

The trees on the Biocycle Farm are planted on a 14- by-14 foot grid. A grass stand will be maintained between the tree rows.

The irrigation requirements for the first 2-years was calculated as approximately five-sevenths of the Willamette Valley grass irrigation requirement and two-sevenths of 1- or-2-year old poplar tree uptake.

The net irrigation requirements for 2- and 4-year old poplars were estimated by Hydrological Engineering in a study conducted for the City of Woodburn (Hydrological Engineering, 1998)

Table 8-1 - Gross Irrigation Requirements of Grass and Poplars for the Willamette Valley Region*
(ac-in/ac)

Month	Grass	1 –Year Old Poplar and Grass	2-Year Old Poplar and Grass	3-Year Old Poplar	4-10 Year Old Poplar
January	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0
April	0.3	0.7	0.7	0.7	0.7
May	2.2	1.6	1.7	1.7	1.9
June	4.2	2.9	2.9	4.1	4.5
July	7.7	4.8	5.0	8.0	8.5
August	6.1	3.7	4.1	10.4	10.4
September	2.9	2.3	2.6	3.9	4.3
October	0.2	1.5	1.3	1.4	1.5
November	0.0	0.2	0.2	0.2	0.2
December	0.0	0.0	0.0	0.0	0.0
Total	**23.6**	**17.7**	**18.5**	**30.4**	**32**

* Data provided by CH2MHill report, *Biosolids Land Application Farm and Site Feasibility and Conceptual Design*, April 2000.
Notes:

1. *Net irrigation requirement is based on OSU Oregon Crop Water Use and Irrigation Requirements, October 1992;*
2. *Estimation of Plant Water Use and Crop Curves for Hybrid Poplars by Gotchis and Cuenca and report by Hydrologic Engineering, Inc. 1997*
3. *Irrigation efficiency = 85 percent*
4. *Gross irrigation required = Net Irrigation Required/Efficiency*

The goal of irrigation operations is to:

- Prevent percolation of water below the root zone during the irrigation season.
- Provide irrigation in the months of May through October when the hose reel system is also applying liquid biosolids*.
- Provide irrigation to maximize growth potential of the crop and biosolids nutrient use.

** Some of the crop water requirement will also be met through liquid biosolids application. Some irrigation may be required in April for new plantation plantings.*

During the irrigation season, soil moisture monitoring will confirm design application rates. Soil samples from several locations representative of soil conditions and soil types will be collected to observe and monitor for Soil Feel and Appearance (see appendix C, Soil moisture data). The procedure involves the use of a soil core sampler to obtain soil samples at 1 foot depth. of the rooting zone to access soil water status. Collected samples are compared to the information in Table 8-2, which gives the characteristics of the soil texture in terms of feel and appearance at different water content (samples are generally collected prior to each irrigation pass).

Table 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
100 % (Field Capacity	Appears Very Dark, leaves wet outline on hand: will ribbon out about 1-inch	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
70% - 80%	Quite Dark: makes tight ball: ribbons out about ½-inch	Quite Dark: ribbons and slicks easily: makes plastic ball
60% - 65%	Fairly Dark: forms firm ball: barley ribbons	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

8.2 Nitrogen Loading Rates

Nutrient application rates are based on deficit agronomic rates for the crop nitrogen requirements. The percent of the nitrogen available for plant uptake for the different nitrogen types are summarized in Table 8-3. These percentages are applied to regular analyses of the Recycled Water and biosolids nitrogen content to determine the amount of plant available nitrogen (PAN) in the source material. The PAN in the applied material is used in combination with the amount of material applied to determine the site nitrogen loading in pounds of PAN per acre (lb-N/acre). The annual nitrogen loading is monitored for each management unit within the site.

The loading rates are calculated and updated daily during the irrigation season on the operations spreadsheet (Appendix B). Nutrient and, or hydraulic loadings will be discontinued for the year when the annual loading rate reaches the management unit capacity for the year.

Table 8-3 Available Nitrogen Assumptions for Loading Rate Calculations for Biocycle Farm

Nitrogen Source	Percent of Nitrogen Available for Plant Uptake
Reclaimed Water	
Organic nitrogen	20 percent
Ammonia Nitrogen	85 percent
Nitrate and Nitrite Nitrogen	100 percent
Class B Cake Biosolids	
Organic Nitrogen	15 percent
Ammonia Nitrogen	50 percent
Nitrate and Nitrite Nitrogen	100 percent
Class B Liquid Biosolids and Filtrate	
Organic Nitrogen	20 percent
Ammonia Nitrogen	50 percent
Nitrate and Nitrite Nitrogen	100 percent

The agronomic nutrient requirement is the amount of fertilizer such as available nitrogen, phosphorus, and potassium, which is needed to obtain an optimum crop yield. The total available nitrogen needed for mature hybrid-poplar trees is assumed to be 260 lb/ac/yr and 150 lb/ac/yr for grass. However, the biosolids distribution system limits the nutrient and hydraulic loading available on site; resulting in crop nutrient and irrigation

requirements not be fully met. This will reduce the tree and grass uptake of nitrogen to approximately 220 lb/acre for trees and 120 lb/acre for grass.

Table 8-4 Annual Nitrogen Loading Rate for Poplar Tree and Grass Crops at Biocycle Farm, Lbs/PAN/acre

	1 year-old	2 year-old	3 year-old	Beyond 3 year-old
Poplar Trees	150	180	200	220
Grass	120	120	120	120

These nutrient loading rates are less than the prescribed agronomic uptake for these crops. The crops will, in effect, be under-fertilized and will attempt to extract nitrogen available in the near surface soil pore water. When the shallow pools of available nitrogen have been exhausted, the poplar trees will attempt to access deeper sources of water to obtain nitrogen. The deeper zones will include the upper few feet of the groundwater table. Because the poplars will still desire nutrients, the trees will extract additional available nutrients from the upper aquifer, if present. This will help limit potential leaching to groundwater below areas of direct biosolids and reclaimed water applications.

Soils and monitoring wells at the site will be regularly monitored (see Section 12.2) to determine if excess leaching of nitrogen is occurring. If the monitoring suggests that the site is being over or under-loaded, these initial estimates for crop capacity will be re-evaluated and recommendations of adjustment to loading rates will be made.

Section 9

System Operation

9.1 Irrigation System Controls

Three Recycled Water Irrigation Pumps are used to pump recycled water from the Reuse Mix Tank to the Biocycle Farm. The Irrigation Pumps are horizontal, end-suction, centrifugal pumps, operated by 60 horsepower motors that are controlled by VFDs. The pumps are located on the West side of the ground floor of the Reuse pump station. Each pump has a capacity of 300 to 800 gpm at 80-100 psi.

Each Irrigation Pump has a 6-inch manual plug valve on the suction piping and an 8-inch manual plug valve on the discharge piping. The valves are used to isolate a pump for maintenance. An 8-inch check valve is located on the discharge piping of each pump between the pump and the isolation valve. The check valve prevents reversal of flow in the pump discharge piping.

Pressure indicators on the discharge piping provide a local indication of the pump discharge pressure.

An 8-inch magnetic flow meter is located on the discharge piping of each Irrigation Pump. Each flow meter measures the flow from each Irrigation Pump. The measured flow rate for each flow meter is available through local readout at the instrument panel and the PLC PanelView.

A pressure indicator/transmitter located on the Irrigation Pumps discharge header monitors the pressure to the Biocycle Farm and inputs the pressure to the PLC. The PLC control logic uses low and high pressure set points to control the Irrigation Pumps. The measured pressure is available through local readout at the instrument panel, the PLC PanelView, and in the operations control room.

An ultrasonic type level sensor measures the liquid level in the HSST and inputs the level to the PLC. The PLC control logic alarms when a high level setpoint is reached and shuts down the Irrigation Pumps based on low level. The measured level is available through local readout at the instrument panel, the PLC PanelView in the Reuse Mix Tank control building, and the operations control room.

A level switch low and level switch high also monitor the liquid level in the Reuse Mix Tank and alarm low level and high levels to the PLC. The level switches provide redundancy and provide hardwired interlocks to shut down the Irrigation Pumps based on low level.

A combination air valve is located on the high point of the Recycled Water conveyance line and Irrigation Discharge Header. These valves consist of both a large and small orifices. The large orifice allows large volumes of air to escape when the pipe is filling (pumps start up) and allows large volumes of air to enter the pipe during drainage (when pumps are shut down). The small orifice allows small intermittent pockets of air to escape as needed when the large orifice is closed.

Each of the Irrigation Pumps are equipped with an emergency stop button. These buttons are used to immediately stop the respective equipment in an emergency. The emergency stop buttons are red buttons located adjacent to each piece of equipment. Each emergency stop button is hardwire interlocked with the

respective piece of equipment. The emergency stop buttons are "maintained" contacts which require the push button to be pulled back out to restart the respective piece of equipment.

9.1.2 Motor Control Center (MCC)

A Motor Control Center (MCC) is located in the Reuse Mix Tank Control Building and distributes 480V, 3 phase power to the pump station components. The MCC also houses the VFDs for the Recycled Water Irrigation Pumps.

9.1.3 Programmable Logic Controller (PLC)

An Allen-Bradley PLC is located on the north exterior wall of the Reuse Mix Tank Control Building. This PLC automatically controls the pump station components based on operator initiation and input. An operator may also manually control equipment from the PLC PanelView and Operations control console in the operations control room.

9.2 Recycled Water Mode

The Recycled Water line surfaces at the Reuse Pump Station and flows through a 16-inch Magnetic flow meter and is discharged directly to the Biocycle Farm when operating fewer than three hose reels, or directed to the Reuse Pump Station at BMF and then discharged to the Biocycle Farm when operating more than three hose reels. The flow meter readings are recorded for each day Recycled Water is applied for irrigation to the Biocycle Farm. The flow meter is be serviced/calibrated a minimum of once each year.

The Reuse Pump Station is designed to provide water for up to 10 Hard Hose Reels, approximately 2500 gpm. When operating three or fewer hose reels, the water is discharged into a 50,000 gallon mix tank which serves as a wet well for three irrigation pumps. The Reuse Pump Station design capacity is 2500 gpm (833 gpm each). However, due to the capacity issues related to the smaller (12-inch) conveyance pipeline, the pump station is currently limited to 1800-2000 gpm. It is anticipated that, if/when the 12-inch pipeline is replaced with a 16-inch or larger pipe, the Recycled Water line capacity will be 2500 gpm.

9.3 Liquid Biosolids Mode

Liquid Class B biosolids, at approximately 2-5 percent solids, is pumped by dredge via an enclosed pipe system from the FSLs to one of two 360,000 gallon storage tanks. The liquid biosolids are then transferred into the 50,000 gallon Reuse Mix Tank which serves as a wet well for the three irrigation pumps. The design capacity of the Reuse mixed solids transfer pumps are 900 gpm (300 gpm each). The design capacity of the Reuse irrigation pumps is 2500 gpm (833 gpm each).

Liquid biosolids is pumped through the same supply pipeline as the Recycled Water, to one or more pipeline laterals, which in turn delivers the flow to one of the management units on the site. Within the management units, Hard Hose Reel application equipment is used to apply the liquid biosolids to the land surface. The Hard Hose Reel units may be connected to any of a series of risers from the pipeline laterals.

9.4 Flushing Mode

After a liquid biosolids application has been completed, the Reuse pumps and pipeline system will be flushed with approximately three pipeline volumes of recycled water (estimated at 750,000 gallons) prior to reinitiating recycled water monitoring and recordkeeping.

The 16-inch diameter, 4.5-mile Biocycle Farm irrigation supply pipeline has a hydraulic capacity of approximately 250,000 gallons (see appendix D SOP for flushing irrigation line).

9.5 Irrigation System Description

From the Reuse Pump Station, the Recycled Water will be pumped through an irrigation supply pipeline. The 4.5-mile pipeline loop includes 156 4-inch risers with valves spaced throughout the farm in various management units. There is approximately one riser for every four tree rows in each management unit. Up to 10 hose reels may be connected to any of these risers and operated simultaneously at a constant and equal flow rate of approximately 250 gpm per hose reel.

A constant and consistent pressure, and thus equally distributed flow to each riser is maintained in two ways. A pressure indicating controller mounted on the irrigation header input sends a pressure reading to the PLC, the PLC in turn controls the speed of the irrigation and the number of pumps on-line to maintain the set point pressure. Secondly, the Irrigation distribution line is constructed with a connection loop (see Figures 9.1 and 9.2) so that the entire distribution line is under identical operating conditions, regardless of the point on the line or the number of irrigation risers in the open position.

Figure 9.1

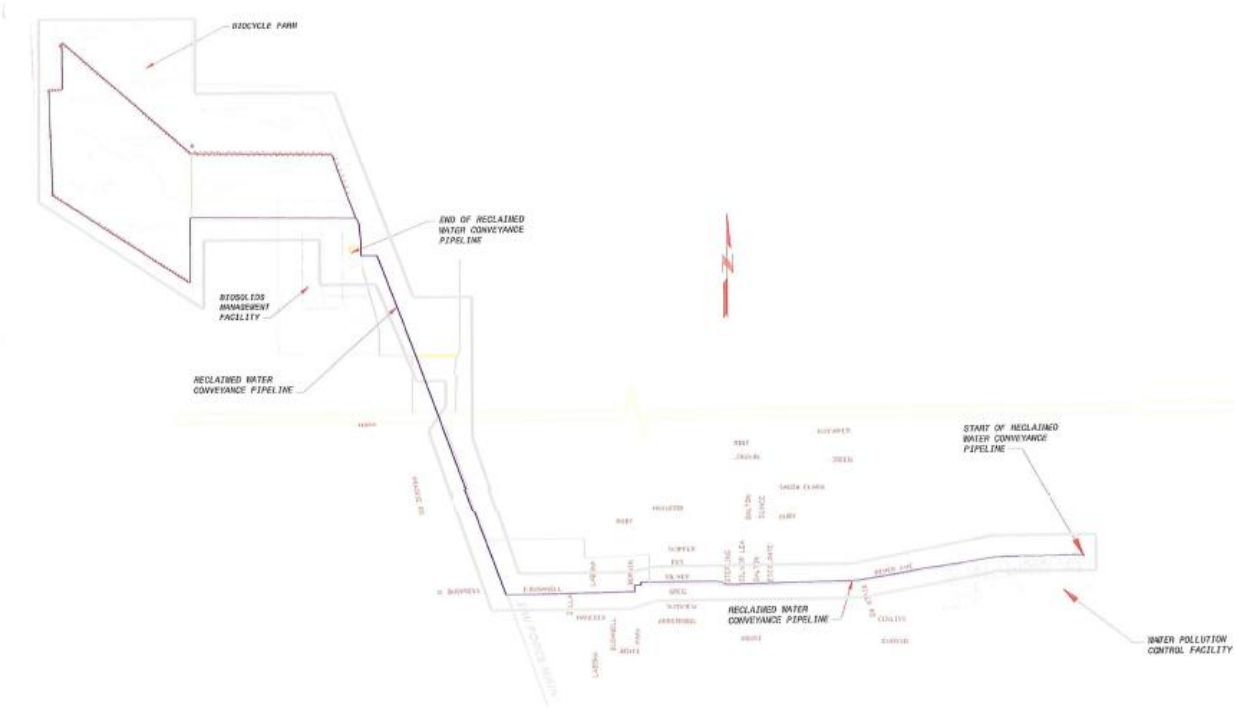


Figure 9.2

Figure 9-3 Hose Reel

Figure 9-4 Irrigation Cart

Within the management units, Hard Hose Reel application equipment will be used to apply the water to the land surface.

Figure 9-3 is a photo of the Hard Hose Reel units. These units may be connected to any series of risers from the pipeline laterals. Each pass of the Hard Hose Reel irrigation cart will cover a 56-foot path, or four tree rows (two rows on each side of the irrigation cart). A photo of a Hard Hose Reel irrigation cart is shown in Figure 9-4.

The irrigation cart includes two fan nozzles each rated at 150 gpm, and at 40 psi. The nozzles are attached to the irrigation cart approximately 18-inches above the ground surface and are oriented at 18°. The 18° orientation, combined with a flow rate of 150 gpm and line pressure of 40 psi, produces a 56-foot spread width with maximum trajectory height of 6-feet.

The combination of low water pressure, low trajectory fan nozzles, and large water droplets controls aerosol drift. Prevailing winds during the irrigation season (May-September) are from the north to the south. The south end of the Biocycle Farm includes a minimum of 200-foot buffer setbacks from water ways, roadways, and other land uses.

At the beginning of the irrigation cycle, the operator uses a tractor to transport the hose reel and irrigation cart to the desired riser location. The hose reel and irrigation cart are aligned with the selected tree row and the cart and irrigation line is pulled out with the tractor to the end of the tree row (a maximum of 1450 feet). The recycled water line is connected to the hose reel with a flexible pressure line, and a hand operated control valve is opened to provide recycled water to the hose reel and irrigation cart.

Application rates are controlled by adjusting the retraction rate of the hose cart. Records of daily retraction rates are recorded on the Biocycle Farm irrigation spread sheet. A computerized controller located on the hose reel keeps the operator selected retraction rate constant throughout pipe retraction.

As the cart approaches the hose reel at the end of the irrigation cycle it contacts a lever which activates the automatic shut-down sequence, closing the recycled water line valve located on the hose reel, and shutting off the hose reel retraction. The operator then rotates the hose reel 180-degrees and extends the irrigation line and irrigation cart down the opposite tree row, or moves the hose reel and irrigation cart to the next set of four tree rows and repeats the cycle.

There is a wireless interface between the hose reels and the SCADA system located at the BMF, designed to assist with remote monitoring of the system. As previously mentioned, the hose reels have a LCD display, keypad to input various operations of the hose reel, e.g. retraction speed, length of pipe, battery voltage, temperature, etc. The hose reels also have a separate controller that allows external devices to communicate.

Each reel is also equipped with a Global Positioning System (GPS) receiver that provides location data to the controller. The controller located on the hose reel receives reel status and GPS location data. The controller utilizes a spread spectrum license free wireless radio transmitter.

A master controller polls the data collected from each hose reel and is capable of sending an on/off command as well as several set points. This data is converted through Allen Bradley controllers and fed to the SCADA graphic display.

Displayed information includes:

- Hose reel is located on Biocycle Farm
- Direction hose reel is facing
- Power on/off

- Battery voltage
- Temperature
- Retraction speed
- Stop time
- Hose extension distance
- Digital status to Master controller

9.6 Design Parameters and Criteria

The pump station and irrigation system design for the Biocycle Farm is based on the following parameters listed in Table 9-6

Table 9-6 – Design Parameters and Criteria

Parameter	Criteria
Production Purpose	Manage trees for reuse and appropriate markets: minimum 20-acre harvest block.
Crop Type	Hybrid-Poplar Trees
Total Irrigated Acreage	395
Tree Spacing	
Between Trees	14 feet
Between Rows	14 feet
Understory	Grass cover crop during first 2-3 years of tree growth; irrigation management to maximize nitrogen use.
Moisture Replaced each irrigation cycle	Varies, typical 1.0 inch/acre
Primary Recycle System Components	
Pump Station	
Peak Pumping Capacity	2500 gpm
Distribution Pipeline	
Material	PVC
Design Flow	2500 gpm
Head Loss	Minimal loss until water reaches Hard Hose Reel
Field Distribution Risers	Ag type 4-inch hose valves with butterfly valve
Irrigation Frequency	Daily
Hose Reels	10
Risers	152
Infield Application System	
Type	Twin Nelson "Bete" Fan Nozzles mounted approximately 18 inches above ground
Flow	250 gpm total (125gpm/nozzle) - Low flow to minimize
Pressure	ponding
Hose Extension Method	Low pressure: 35 to 40 psi 135 hp 4 WD tractor
Central Monitoring and Control	Match pump and field flow

Section 10

Site Buffers and Setbacks

Biocycle Farm utilizes three different buffers and setback distances to ensure public safety and protection of the environment.

10.1 Property lines

A 70-foot setback is maintained from the nearest property boundary to the irrigated area. Typical set back is 100-feet. This minimum set back section of the property is located on the southwest corner of the property, which borders an active freight railroad line and State Highway 99. Neither manmade area is subject to frequent public access or human activities.

10.2 Permanent Surface waterways

A 200-foot buffer is maintained between all permanent surface water ditches and the irrigated area

10.3 Domestic water sources

A 100-foot set back is maintained between all domestic water sources and the irrigated area.

Section 11

Start-Up

11.1 Start-up, Shut-Down, and Seasonal Operations

The Biocycle Farm irrigation system is operated according to an O&M manual developed for the site and standard operating procedures developed to define specific tasks of site operations and maintenance. Because of the seasonal nature of the system, specific procedures have been developed to provide operations staff with start-up, shut-down, and winterization procedures to provide freeze protection of the equipment.

A computerized maintenance management program is utilized to track and perform corrective and preventative maintenance tasks on equipment used for the Biocycle Farm irrigation system. An initial preventative maintenance (PM) schedule has been developed based on manufacturer's recommendations. Subsequent PM schedules may be modified, either increased or decreased in frequency, based on operating experiences.

Section 12

Monitoring, Recordkeeping, and Reporting

12.1 Monitoring Requirements

The Recycled Water is treated to meet Class D requirements, as defined in OAR chapter 340, Division 55, with the added benefit of chlorination to meet secondary effluent criteria.

Sampling and compliance monitoring for all Recycled Water irrigated onto the Biocycle Farm is collected at the E/S WPCF, located at 410 River Avenue, Eugene, Oregon.

The Recycled Water is sampled for all compliance and system monitoring requirements at the E/S WPCF, after chlorination, but prior to the addition of sodium bisulfite, and discharged into the Recycled Water conveyance line for all the parameters listed in the NPDES Permit.

12.2 System Monitoring for Biocycle Farm

At the beginning of each application season, a tentative recycled water and biosolids application schedule will be developed based on expected recycled water and biosolids quality and site nutrient loading capacity. This schedule may be adjusted during the season according to the actual quality as determined through regular monitoring.

Records of application volumes and quality are entered daily into a spreadsheet used to calculate the total nitrogen loading for the management units and to determine when annual loadings begin to approach the design site nitrogen and hydraulic loading capacity. An example of this spreadsheet and a listing of the calculations used to determine application rates, is located in Appendix B. All records will be available for inspection by the Department upon request.

12.3 Recordkeeping

The following records will be kept on file and will be available for inspection by the Department at all times:

1. A DEQ approved copy of the Recycled Water Use Plan
2. Copies of maps and drawings for the site
3. Monthly meter reading data and site inspection reports
4. Monthly spread sheet for Recycled Water characteristics and flow records
5. Reports of any problems related to the production and/or distribution of Recycled Water

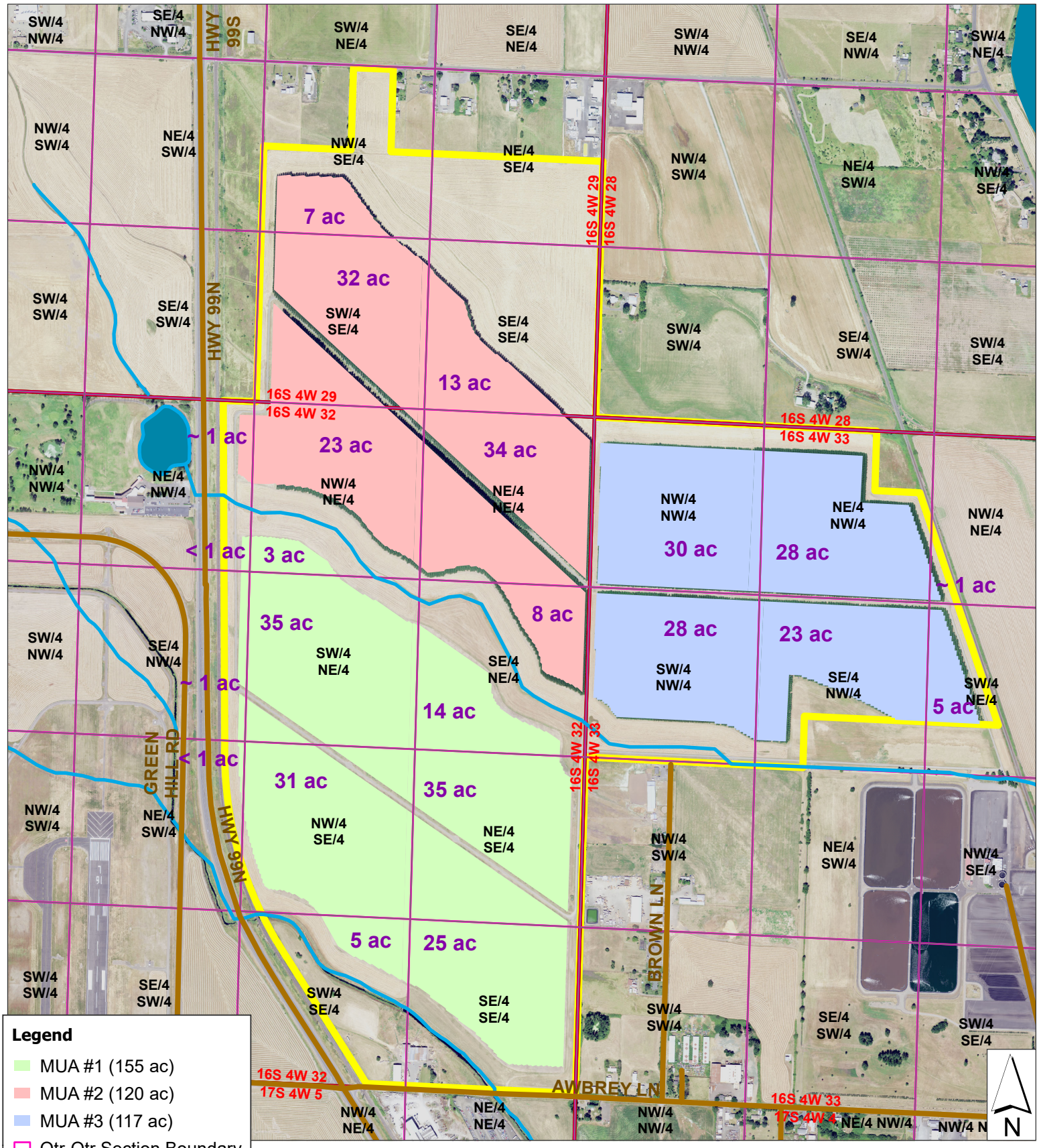
12.4 Reporting

A report of MWMC Recycled Water activities for the previous calendar year will be prepared and submitted to the DEQ annually, on or before January 31 of the following year. MWMC will utilize the electronic reporting form provided by DEQ.

From a performance-based perspective, the annual report is the mechanism for changing site operations. The operations plan will be evaluated, and operational changes for the upcoming year will be proposed and explained. The loading or application rates may change in response to results from the performance-based monitoring and projected effluent volume for the upcoming year at the Biocycle Farm.

Recommendations to revise the monitoring plan, which may include an increase, or a reduction in monitoring frequency and monitoring constituents, will be addressed in the report.

Metropolitan Wastewater Management Commission
Biocycle Farm Reuse Water Irrigation Application Areas



Legend

- MUA #1 (155 ac)
- MUA #2 (120 ac)
- MUA #3 (117 ac)
- Qtr-Qtr Section Boundary
- Section Boundary
- Biocycle Farm Boundary
- Creek/Stream/Waterbody
- Streets

0 360 720 1440 Ft

Caution:
This map is based on imprecise source data, subject to change, and for general reference only.

15 Jan 2020

Eugene

Department of Environmental Quality

Chapter 340

Division 55
RECYCLED WATER USE

340-055-0005
Purpose

These rules (OAR 340-055-0005 to 340-055-0030) prescribe requirements for the use of recycled water for beneficial purposes. The purpose of this division is to protect the environment and public health in the State of Oregon.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.015 & 468B.020
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0007
Policy

It is the policy of the Environmental Quality Commission to encourage the use of recycled water for domestic, agricultural, industrial, recreational, and other beneficial purposes in a manner which protects public health and the environment of the state. The use of recycled water for beneficial purposes will improve water quality by reducing discharge of treated effluent to surface waters, reduce the demand on drinking water sources for uses not requiring potable water, and may conserve stream flows by reducing withdrawal for out-of-stream use.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.015
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0010
Definitions

The following definitions apply to this division of rules:

(1) “Artificial Groundwater Recharge” means the intentional addition of water diverted from another source to a groundwater reservoir.

(2) "Beneficial Purpose" means a purpose where recycled water is utilized for a resource value, such as nutrient content or moisture, to increase productivity or to conserve other sources of water.

(3) “Department” means the Oregon Department of Environmental Quality.

(4) "Disinfected Wastewater" means wastewater that has been treated by a chemical, physical or biological process and meets the criteria if applicable to its classification for use as recycled water.

(5) “Filtered Wastewater” means an oxidized wastewater that meets the criteria defined in OAR 340-055-0012(7)(c).

(6) “Human Consumption” means water used for drinking, personal or oral hygiene, bathing, showering, cooking, or dishwashing.

(7) "Landscape Impoundment" means a body of water used for aesthetic purposes or other function that does not include public contact through activities such as boating, fishing, or body-contact recreation. Landscape impoundments include, but are not limited to, golf course water ponds or non-residential landscape ponds.

(8) "Nonrestricted Recreational Impoundment" means a constructed body of water for which there are no limitations on body-contact water recreation activities. Nonrestricted recreational impoundments include, but are not limited to, recreational lakes, water features accessible to the public, and public fishing ponds.

(9) "NPDES Permit" means a National Pollutant Discharge Elimination System permit as defined in OAR chapter 340, division 45.

(10) "Oxidized Wastewater" means a treated wastewater in which the organic matter is stabilized and nonputrescible, and which contains dissolved oxygen.

(11) "Person" means the United States and agencies thereof, any state, any individual, public or private corporation, political subdivision, governmental agency, municipality, copartnership, association, firm, trust estate, or any other legal entity.

(12) “Processed Food Crops” means those crops that undergo thermoprocessing sufficient to kill spores of Clostridium botulinum.

(13) “Recycled Water” means treated effluent from a wastewater treatment system which as a result of treatment is suitable for a direct beneficial purpose. Recycled water includes reclaimed water as defined in ORS 537.131.

(14) "Restricted Recreational Impoundment" means a constructed body of water that is limited to fishing, boating, and other non-body contact water recreation activities.

(15) “Sprinkler Irrigation” means the act of applying water by means of perforated pipes or nozzles operated under pressure so as to form a spray pattern.

(16) “Wastewater” or "Sewage" means the water-carried human or animal waste from residences, buildings, industrial establishments or other places, together with such groundwater infiltration and surface water as may be present. The admixture with sewage of wastes or industrial wastes shall also be considered “wastewater” within the meaning of this division.

(17) “Wastewater Treatment System” or "Sewage Treatment System" means an approved facility or equipment used to alter the quality of wastewater by physical, chemical or biological means or a combination thereof that reduces the tendency of the wastewater to degrade water quality or other environmental conditions.

(18) “Waters of the State” means lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the

State of Oregon, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters) that are located wholly or partially within or bordering the state or within its jurisdiction.

(19) "WPCF Permit" means a Water Pollution Control Facilities permit as defined in OAR chapter 340, division 45.

(20) “Wetlands” means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.005, 468B.030 & 468B.050
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0012
Recycled Water Quality Standards and Requirements

(1) Any person having control over the treatment or distribution or both of recycled water may distribute recycled water only for the beneficial purposes described in this rule, and must take all reasonable steps to ensure that the recycled water is used only in accordance with the standards and requirements of the rules of this division.

(2) Any person who uses recycled water may use recycled water only for the beneficial purposes described in this rule, and must comply with the standards and requirements of this rule and the rules of this division.

(3) The following requirements apply to nondisinfected recycled water.

(a) Beneficial Purposes. Nondisinfected recycled water may be used only for the following beneficial purposes and only if the rules of this division are met:

(A) Irrigation for growing fodder, fiber, seed crops not intended for human ingestion, or commercial timber; and

(B) Any beneficial purpose authorized in writing by the department pursuant to OAR 340-055-0016(6).

(b) Treatment. Nondisinfected recycled water must be an oxidized wastewater.

(c) Criteria. There are no disinfection criteria for nondisinfected recycled water.

(d) Monitoring. Monitoring must be in accordance with the wastewater treatment system owner’s NPDES or WPCF permit.

(e) Setback Distances. There must be a minimum of 150 feet from the edge of the irrigation site to a water supply source used for human consumption. Other site specific setback distances for irrigation necessary to protect public health and the environment must be established in the recycled water use plan and must be met when irrigating.

(f) Access and Exposure. Public access to the irrigation site must be prevented.

(g) Site Management.

(A) Irrigation with recycled water is prohibited for 30 days before harvesting.

(B) Sprinkler irrigation is prohibited unless authorized in advance and in writing by the department based on demonstration that public health and the environment will be adequately protected from aerosols.

(4) The following requirements apply to Class D recycled water.

(a) Beneficial Purposes. Class D recycled water may be used only for the following beneficial purposes and only if the rules of this division are met:

(A) Any beneficial purpose defined in subsection (3)(a) of this rule;

(B) Irrigation of firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals; and

(C) Any beneficial purpose authorized in writing by the department pursuant to OAR 340-055-0016(6).

(b) Treatment. Class D recycled water must be an oxidized and disinfected wastewater that meets the numeric criteria in subsection (c) of this section.

(c) Criteria. Class D recycled water must not exceed a 30-day log mean of 126 E. coli organisms per 100 milliliters and 406 E. coli organisms per 100 milliliters in any single sample.

(d) Monitoring. Monitoring for E. coli organisms must occur once per week at a minimum.

(e) Setback Distances.

(A) Where an irrigation method is used to apply recycled water directly to the soil, there must be a minimum of 10 feet from the edge of the site used for irrigation and the site property line.

(B) Where sprinkler irrigation is used, there must be a minimum of 100 feet from the edge of the site used for irrigation and the site property line.

(C) There must be a minimum of 100 feet from the edge of an irrigation site to a water supply source used for human consumption.

(D) Where sprinkler irrigation is used, recycled water must not be sprayed within 70 feet of an area where food is prepared or served, or where a drinking fountain is located.

(f) Access and Exposure.

(A) Animals used for production of milk must be restricted from direct contact with the recycled water.

(B) When using recycled water for irrigation of sod, ornamental nursery stock, or Christmas trees, the personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. The recycled water use plan must specify how notification will be provided.

(g) Site Management.

(A) When irrigating, signs must be posted around the perimeter of the irrigation site stating recycled water is used and is not safe for drinking.

(B) Irrigation of fodder, fiber, seed crops not intended for human ingestion, sod, commercial timber, firewood, ornamental nursery stock, or Christmas trees is prohibited for three days before harvesting.

(5) The following requirements apply to Class C recycled water.

(a) Beneficial Purposes. Class C recycled water may be used only for the following beneficial purposes and only if the rules of this division are met:

(A) Any beneficial purpose defined in subsection (4)(a) of this rule;

(B) Irrigation of processed food crops;

(C) Irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil;

(D) Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses;

(E) Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing;

(F) Water supply source for landscape impoundments; and

(G) Any beneficial purpose authorized in writing by the department pursuant to OAR 340-055-0016(6).

(b) Treatment. Class C recycled water must be an oxidized and disinfected wastewater that meets the numeric criteria in subsection (c) of this section.

(c) Criteria. Class C recycled water must not exceed a median of 23 total coliform organisms per 100 milliliters, based on results of the last seven days that analyses have been completed, and 240 total coliform organisms per 100 milliliters in any two consecutive samples.

(d) Monitoring. Monitoring for total coliform organisms must occur once per week at a minimum.

(e) Setback Distances.

(A) Where an irrigation method is used to apply recycled water directly to the soil, there must be a minimum of 10 feet from the edge of the site used for irrigation and the site property line.

(B) Where sprinkler irrigation is used, there must be a minimum of 70 feet from the edge of the site used for irrigation and the site property line.

(C) There must be a minimum of 100 feet from the edge of an irrigation site to a water supply source used for human consumption.

(D) Where sprinkler irrigation is used, recycled water must not be sprayed within 70 feet of an area where food is being prepared or served, or where a drinking fountain is located.

(f) Access and Exposure.

(A) When irrigating for a beneficial purpose defined in subsection (4)(a) of this rule, the access and exposure requirements defined in subsection (4)(f) of this rule must be met.

(B) During irrigation of a golf course, a cemetery, a highway median, or an industrial or business campus, the public must be restricted from direct contact with the recycled water.

(C) If aerosols are generated when using recycled water for an industrial, commercial, or construction purpose, the aerosols must not create a public health hazard.

(D) When using recycled water for an agricultural or horticultural purpose where sprinkler irrigation is used, or an industrial, commercial, or construction purpose, the public and personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. The recycled water use plan must specify how notification will be provided.

(g) Site Management.

(A) When irrigating for a beneficial purpose defined in subsection (4)(a) of this rule, the site management requirements defined in subsection (4)(g) of this rule must be met.

(B) When using recycled water for a landscape impoundment or for irrigating a golf course, cemetery, highway median, or industrial or business campus, signs must be posted at the use area and be visible to the public. The signs must state that recycled water is used and is not safe for drinking.

(C) Irrigation of processed food crops is prohibited for three days before harvesting.

(D) When irrigating an orchard or vineyard, the edible portion of the crop must not contact the ground, and fruit or nuts may not be harvested off the ground.

(E) When using recycled water for a landscape impoundment, aerators or decorative fixtures that may generate aerosols are allowed only if authorized in writing by the department.

(6) The following requirements apply to Class B recycled water.

(a) Beneficial Purposes. Class B recycled water may be used only for the following beneficial purposes and only if the rules of this division are met:

(A) Any beneficial purpose defined in subsection (5)(a) of this rule;

(B) Stand-alone fire suppression systems in commercial and residential buildings, non-residential toilet or urinal flushing, or floor drain trap priming;

(C) Water supply source for restricted recreational impoundments; and

(D) Any beneficial purpose authorized in writing by the department pursuant to OAR 340-055-0016(6).

(b) Treatment. Class B recycled water must be an oxidized and disinfected wastewater that meets the numeric criteria in subsection (c) of this section.

(c) Criteria. Class B recycled water must not exceed a median of 2.2 total coliform organisms per 100 milliliters, based on results of the last seven days that analyses have been completed, and 23 total coliform organisms per 100 milliliters in any single sample.

(d) Monitoring. Monitoring for total coliform organisms must occur three times per week at a minimum.

(e) Setback Distances.

(A) Where an irrigation method is used to apply recycled water directly to the soil, there are no setback requirements.

(B) Where sprinkler irrigation is used, there must be a minimum of 10 feet from the edge of the site used for irrigation and the site property line.

(C) There must be a minimum of 50 feet from the edge of the irrigation site to a water supply source used for human consumption.

(D) Where sprinkler irrigation is used, recycled water must not be sprayed within 10 feet of an area where food is being prepared or served, or where a drinking fountain is located.

(f) Access and Exposure.

(A) During irrigation of a golf course, the public must be restricted from direct contact with the recycled water.

(B) If aerosols are generated when using recycled water for an industrial, commercial, or construction purpose, the aerosols must not create a public health hazard.

(C) When using recycled water for an agricultural or horticultural purpose where sprinkler irrigation is used, or an industrial, commercial, or construction purpose, the public and personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. The recycled water use plan must specify how notification will be provided.

(g) Site Management.

(A) When irrigating for a beneficial purpose defined in subsection (4)(a) of this rule, the site management requirements defined in subsection (4)(g) of this rule must be met.

(B) When using recycled water for a landscape impoundment or for irrigating a golf course, cemetery, highway median, or industrial or business campus, signs must be posted at the use area and be visible to the public. The signs must state recycled water is used and is not safe for drinking.

(C) Irrigation of processed food crops is prohibited for three days before harvesting.

(D) When irrigating an orchard or vineyard, the edible portion of the crop must not contact the ground, and fruit or nuts may not be harvested off the ground.

(7) The following requirements apply to Class A recycled water.

(a) Beneficial Purposes. Class A recycled water may be used only for the following beneficial purposes and only if the rules of this division are met:

(A) Any beneficial purpose defined in subsection (6)(a) of this rule;

(B) Irrigation for any agricultural or horticultural use;

(C) Landscape irrigation of parks, playgrounds, school yards, residential landscapes, or other landscapes accessible to the public;

(D) Commercial car washing or fountains when the water is not intended for human consumption;

(E) Water supply source for nonrestricted recreational impoundments;

(F) Artificial groundwater recharge by surface infiltration methods or by subsurface injection in accordance with OAR chapter 340, division 44. Direct injection into an underground source of drinking water is prohibited unless allowed by OAR chapter 340, division 44; and

(G) Any beneficial purpose authorized in writing by the department pursuant to OAR 340-055-0016(6).

(b) Treatment. Class A recycled water must be an oxidized, filtered and disinfected wastewater that meets the numeric criteria in subsection (c) of this section are met.

(c) Criteria. Class A recycled water must not exceed the following criteria:

(A) Before disinfection, unless otherwise approved in writing by the department, the wastewater must be treated with a filtration process, and the turbidity must not exceed an average of 2 nephelometric turbidity units (NTU) within a 24-hour period, 5 NTU more than five percent of the time within a 24-hour period, and 10 NTU at any time, and

(B) After disinfection, Class A recycled water must not exceed a median of 2.2 total coliform organisms per 100 milliliters, based on results of the last seven days that analyses have been completed, and 23 total coliform organisms per 100 milliliters in any single sample.

(d) Monitoring.

(A) Monitoring for total coliform organisms must occur once per day at a minimum.

(B) Monitoring for turbidity must occur on an hourly basis at a minimum.

(e) Setback Distances. Where sprinkler irrigation is used, recycled water must not be sprayed onto an area where food is being prepared or served, or onto a drinking fountain.

(f) Access and Exposure. When using recycled water for an agricultural or horticultural purpose where spray irrigation is used, or an industrial, commercial, or construction purpose, the public and personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. The recycled water use plan must specify how notification will be provided.

(g) Site Management. When using recycled water for a landscape impoundment, restricted recreational impoundment, nonrestricted recreational impoundment, or for irrigating a golf course, cemetery, highway median, industrial or business campus, park, playground, school yard, residential landscape, or other landscapes accessible to the public, signs must be posted at the use area or notification must be made to the public at the use area indicating recycled water is used and is not safe for drinking. The recycled water use plan must specify how notification will be provided.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
Renumbered from 340-055-0015, DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0013
Exempted Use of Recycled Water

Recycled water used by a wastewater treatment system owner for landscape irrigation or for in plant processes at a wastewater treatment system is exempt from the rules of this division if:

(1) The recycled water is an oxidized and disinfected wastewater;

(2) 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. Contiguous property to the parcel of land upon which the treatment system is located is considered the wastewater treatment system site if under the same ownership;

(3) Spray or drift or both from the use does not occur off the site; and

(4) Public access to the site is restricted.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.050
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0016
General Requirements for Permitting the Use of Recycled Water

(1) NPDES or WPCF permit. A wastewater treatment system owner may not provide any recycled water for use unless authorized by a NPDES or WPCF permit issued by the department pursuant to OAR chapter 340, division 045.

(2) Recycled water use plan.

(a) Except for use of recycled water authorized by a NPDES or WPCF permit, a wastewater treatment system owner may not provide any recycled water for distribution or use or both until a recycled water use plan meeting the requirements of OAR 340-055-0025 has been approved in writing by the department. Upon approval of the plan, the permittee must comply with the conditions of the plan.

(b) Before approving or modifying any plan for the use of Class C, Class D, or nondisinfected recycled water, the department will submit the proposed plan to the Oregon Department of Human Services for comment.

(c) For use of recycled water previously authorized under a NPDES or WPCF permit but without a department approved recycled water use plan, the wastewater treatment system owner must submit a recycled water use plan to the department within one year of the effective date of these rules.

(3) Land application on land zoned exclusive farm use. A recycled water use plan will not be approved for the land application of recycled water on land zoned exclusive farm use until the requirements of ORS 215.213(1)(bb) and 215.283(1)(y) for recycled water are met.

(4) Compliance with this division. When the rules of this division require a limitation or a condition or both that conflicts with a limitation or a condition or both in an existing permit, the existing permit controls until the permit is modified or renewed by the department. When the existing permit is modified or renewed, the permittee will be given a reasonable compliance schedule to achieve new requirements if necessary.

(5) Additional permit limitations and conditions. The department may include additional permit limitations or conditions or both if it determines or has reason to believe additional requirements for the use of recycled water are necessary to protect public health or the environment or both.

(6) Authorization of other recycled water uses. The department may authorize through a NPDES or WPCF permit a use of recycled water for a beneficial purpose not specified in this division. When the department considers the authorization, it may request information and include permit limitations or conditions or both necessary to assure protection of public health and the environment. The department will confer with the Oregon Department of Human Services before authorizing other uses of Class C, Class D, or nondisinfected recycled water under this section.

(7) Setback distances. The department may consider and approve, on a case-by-case basis, a setback distance other than what is required in this division. For a reduced setback distance, it must be demonstrated to the department that public health and the environment will be adequately protected. The recycled water use plan must include any approved alternative setback distance.

(8) Public outreach and sign posting. When the rules of this division require the posting of signs at a use area, the department may, on a case-by-case basis, approve an alternative method for public outreach where it considers the method will assure an equivalent degree of public protection.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
Renumbered from 340-055-0015, DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0017
Treatment and Use of Recycled Water

(1) Alternative treatment process. The department may approve in writing an alternative wastewater treatment process not specified in the rules of this division if it is demonstrated that the treatment is equivalent to and can achieve the recycled water criteria required for a specific beneficial purpose.

(2) Additional treatment. A person using recycled water from a wastewater treatment system may provide additional treatment for a different class of recycled water that is identified in this division. The wastewater treatment system owner providing the additional treatment is subject to the rules of this division and must have a NPDES or WPCF permit issued by the department.

(3) Blending recycled water. The department may approve on a case-by-case basis blending recycled water with other water if proposed by a wastewater treatment system owner. Before blending recycled water, the owner must obtain written authorization from the department. In obtaining authorization, the wastewater treatment system owner must submit to the department, at a minimum the following:

(a) An operations plan,

(b) A description of any additional treatment process,

(c) A description of blending volumes, and

(d) A range of final recycled water quality at the compliance point identified in the NPDES or WPCF permit.

(4) Water right. The rules of this division do not create a water right under ORS chapters 536, 537, 539 or 540. A person must contact the Oregon Water Resources Department to determine water right requirements for the use of recycled water.

(5) Prohibited use for human consumption. The use of recycled water for direct human consumption, regardless of the treatment class, is prohibited unless approved in writing by the Oregon Department of Human Services, and after public hearing, and it is so authorized by the Environmental Quality Commission.

(6) Prohibited use for a public pool. The use of recycled water as a source of supply for a public pool, spa, or bathhouse is prohibited unless authorized in writing by the department and with written approval from the Oregon Department of Human Services. Public pools are subject to the requirements of ORS 448 and the Oregon Department of Human Services administrative rules.

(7) Transporting recycled water. A vehicle used to transport or distribute recycled water must not be used to transport water for human consumption, unless authorized in writing by the department. The vehicle must be clearly identified with the words “nonpotable water” written in letters at least six inches high and displayed on each side and rear of the vehicle unless otherwise authorized by the department.

(8) Impoundments. Constructed landscape, and restricted and nonrestricted recreational impoundments approved for use under the rules of this division are not considered waters of the state for water quality purposes. Impoundments used for wastewater treatment are subject to ORS 215.213 and 215.283.

(9) Wetlands.

(a) The term “waters of the state” as provided in OAR 340-055-0012(18) includes, but is not limited to, the following wetlands and discharge to any of these wetlands requires a NPDES permit issued by the Department pursuant to OAR chapter 340, division 45:

(A) Enhanced or restored wetlands;

(B) Existing natural wetlands; and

(C) Wetlands created as mitigation for loss of wetlands under the Clean Water Act, Section 404.

(b) Wetlands constructed on non-wetland sites and managed for wastewater treatment are exempt from the rules of this division and are not considered waters of the state for water quality purposes.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
Renumbered from 340-055-0015, DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0020
Groundwater Quality Protection

Recycled water will not be authorized for use unless all groundwater quality protection requirements in OAR chapter 340, division 40 are met. The requirements in OAR chapter 340, division 40 are considered to be met if the wastewater treatment system owner demonstrates recycled water will be used or land applied in a manner and at a rate that minimizes the movement of contaminants to groundwater and does not adversely impact groundwater quality. If the use of recycled water occurs within a designated groundwater management area, the department may require additional conditions to be met.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.150 - 468B.190
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0022
Monitoring and Reporting

(1) The department will include in a NPDES or WPCF permit authorizing the use of recycled water, at a minimum, the monitoring requirements in OAR 340-055-0012.

(2) When chlorine or a chlorine compound is used as a disinfecting agent, the department may specify in the NPDES or WPCF permit a minimum chlorine residual concentration. When other disinfecting agents are used, the department may require additional monitoring requirements to assure adequate disinfection.

(3) The department will include in a NPDES or WPCF permit authorizing the use of recycled water, a requirement that the wastewater treatment system owner submit an annual report to the department describing the effectiveness of the system to comply with the approved recycled water use plan, the rules of this division, and the permit limits and conditions for recycled water.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
Renumbered from 340-055-0015, DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0025
Recycled Water Use Plan

(1) A recycled water use plan must describe how the wastewater treatment system owner will comply with the rules of this division and must include, but is not limited to, the following:

(a) A description of the wastewater treatment system, including treatment efficiency capability;

(b) A detailed description of the treatment methods that will be used to achieve a specific class of recycled water and for what beneficial purpose;

(c) The estimated quantity of recycled water to be provided by the wastewater treatment system owner to the user, and at what frequency and for what beneficial purpose;

(d) A description of contingency procedures that ensure the requirements of this division are met when recycled water is provided for use;

(e) Monitoring and sampling procedures;

(f) A maintenance plan that describes how the wastewater treatment system equipment and facility processes will be maintained and serviced;

(g) If notification is required by the rules of this division, a description of how the public and personnel at the use area will be notified; and

(h) A description of any measuring and reporting requirements identified by the Oregon Water Resources Department after consultation with that agency.

(2) If Class B, C, or D, or nondisinfected recycled water is to be used for irrigation, a recycled water use plan must also include, but is not limited to, the following:

(a) A description and identification of the land application site, including the zoned land use of the irrigation site and surrounding area, a site map with setbacks, and distances of nearest developed property from all boundaries of the irrigation site;

(b) A description of the irrigation system, including storage, distribution methods, application methods and rates, and shut off procedures;

(c) A description of the soils and crops or vegetation grown at the land application site;

(d) A description of site management practices including, but not limited to, the timing of application, methods used to mitigate potential aerosol drift, and if required by this division, posting of signs or public outreach; and

(e) If public access control or notification is required by this division, descriptions of public access control and how the public and personnel will be notified.

(3) If Class A recycled water is to be used for the beneficial purpose of artificial groundwater recharge, a recycled water use plan must also include, but is not limited to, the following:

(a) A groundwater monitoring plan in accordance with OAR 340-040-0030(2);

(b) A determination if the recharge will be to a drinking water protection area;

(c) A description of the soils and characteristics;

(d) The distance from the recharge area to the nearest point of withdrawal and the retention time in the aquifer until the time of withdrawal; and

(e) Verification from Oregon Water Resources Department that a request for authorization for this use has been initiated.

(4) Conditions contained in a department approved recycled water use plan are NPDES or WPCF permit requirements.

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

340-055-0030
Operational Requirements for the Treatment and Distribution of Recycled Water

(1) Bypassing. The intentional diversion of wastewater from any unit process in the wastewater treatment system for a beneficial purpose is not allowed, unless with the unit process out of service the recycled

water meets the criteria of this division for a specific class and beneficial purpose described in the recycled water use plan.

(2) Alarm devices. Alarm devices are required to provide warning of power loss and failure of process equipment essential to the proper operation of the wastewater treatment system and compliance with this division.

(3) Standby power. Unless otherwise approved in writing by the department, a wastewater treatment system providing recycled water for use must have sufficient standby power to fully operate all essential treatment processes. The department may grant an exception to this section only if the wastewater treatment system owner demonstrates that power failure will not result in inadequately treated water being provided for use and will not result in any violation of an NPDES or WPCF permit limit or condition or Oregon Administrative Rule.

(4) Redundancy. A wastewater treatment system that provides recycled water for use must have a sufficient level of redundant treatment facilities and monitoring equipment to prevent inadequately treated recycled water from being used or discharged to public waters.

(5) Distribution system requirements. Unless otherwise approved in writing by the department, all piping, valves, and other portions of the recycled water use system that is outside a building must be constructed and marked in a manner to prevent cross-connection with a potable water system. Unless otherwise approved in writing by the department or as required by the rules of this division, construction and marking must be consistent with sections (2), (3), (4), and (5) of the 1992 "Guidelines for the Distribution of Nonpotable Water" of the California-Nevada Section of the American Water Works Association.

(6) Cross-connection control. Connection between a potable water supply system and a recycled water distribution system is not authorized unless the connection is through an air gap separation approved by the department. A reduced pressure principle backflow prevention device may be used only when approved in writing by the department and the potable water system owner.

[Publications: Publications referenced are available from the agency.]

Statutory/Other Authority: ORS 468.020, 468.705 & 468.710
Statutes/Other Implemented: ORS 468B.030 & 468B.050
History:
DEQ 6-2008, f. & cert. ef. 5-5-08
DEQ 32-1990, f. & cert. ef. 8-15-90

BF Soil Moisture

. able 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water (Reclaimed Water Use Plan for MWMC).

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
100 % (Field Capacity)	Appears Very Dark, leaves wet outline on hand: will ribbon out about 1-inch	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
70% - 80%	Quite Dark: makes tight ball: ribbons out about ½-inch	Quite Dark: ribbons and slicks easily: makes plastic ball
60% - 65%	Fairly Dark: forms firm ball: barley ribbons	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon- 0.5"	NW corner of North Unit 2 -row 53
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.25/0.5"	Mid of North Unit 2 -row 67
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.25/0.5"	Near road of North Unit 2 -row 82
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.5"	NE corner of North Unit 2 -row 94
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.5"	Middle of South Unit 2 -row 90
3/25/21	2	Light color, crumbly ball	Slight ribbon -0.25/0.5"	South end of South Unit 2 -row 76
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.25/0.5"	Middle of South Unit 2 -row 61
3/25/21	2	Slightly dark, Forms crumbly ball	Slight ribbon -0.25/0.5"	Middle of South Unit 2 -row 49

BCF Soil Moisture

Available Water	CLAY LOAM
100 % (Field Capacity)	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
70% - 80%	Quite Dark: ribbons and slicks easily: makes plastic ball
60% - 65%	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Hard, Baked, cracked, light color
Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger	

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
12MAY21	2	- firm ball, ribbons ¼ - ½" - crumbly - weak ball, no ribbon	- ribbons ¼ - ½" - no ribbon	lower spot 1½ water estimate for good delivery

BF Soil Moisture

able 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water (Reclaimed Water Use Plan for MWMC).

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
100 % (Field Capacity)	Appears Very Dark, leaves wet outline on hand: will ribbon out about 1-inch	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
70% - 80%	Quite Dark: makes tight ball: ribbons out about ½-inch	Quite Dark: ribbons and slicks easily: makes plastic ball
60% - 65%	Fairly Dark: forms firm ball: barley ribbons	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
6/9	2	slightly dark, no ball crumbly, dry	No ribbon	Mid-south of road 20-30% H_2O
6/9	2	slightly dark, no ball crumbly, dry	No ribbon	mid-north of road 20-30% H_2O
6/9	2	brown, No ball, crumbly, dry	No ribbon	West - south of road 10-30% H_2O
6/9	2	brown, No ball, crumbly, dry	No ribbon	West - north of road 10-30% H_2O
6/9	2	brown, No ball crumbly, dry	No ribbon	East - south of road 20-30% H_2O
6/9	2	brown, forms weak crumbly ball, dry to semi moist	No ribbon	East - north of road 20-35% H_2O

BF Soil Moisture

Table 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water (Reclaimed Water Use Plan for MWMC).

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
100 % (Field Capacity)	Appears Very Dark, leaves wet outline on hand: will ribbon out about 1-inch	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
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50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Middle of row 45- North of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	North end of row 33- North of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Close to road row 22- North of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Middle of row 8- North of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	end of row 45 - South of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Middle of row 33 - South of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Close to road of row 22 - South of road
6/21/21	1	Slightly dark, crumbly ball	No ribbon	Middle of row 8 - South of road

BF Soil Moisture

Table 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water (Reclaimed Water Use Plan for MWMC).

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
100 % (Field Capacity)	Appears Very Dark, leaves wet outline on hand: will ribbon out about 1-inch	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
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50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
6.22.21	2	slightly dark, weak crumbly ball	no ribbon	Row 53 North of Road in the middle
	2	slightly dark, weak crumbly ball	no ribbon	Row 65 North of road far northend row
	2	slightly dark weak, crumbly ball	no ribbon	Row 80 North of Road near road
	2	slightly dark weak, crumbly ball	no ribbon	Row 92 North of road middle
	2	slightly dark, weak crumbly ball	no ribbon	Row 53 South of road South end of row
	2	slightly dark weak crumbly ball	no ribbon	Row 65 South of road near middle
	2	slightly dark weak crumbly ball	no ribbon	Row 80 South of Road near road
	2	slightly dark weak crumbly ball	no ribbon	Row 92 South of road near middle

BF Soil Moisture

Table 8-2 Soil Feel and Appearance Chart for Estimating Available Soil Water (Reclaimed Water Use Plan for MWMC).

	SOIL TEXTURE	
Available Water	**MEDIUM (LOAM)**	**FINE (SILT LOAM, CLAY LOAM**
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60% - 65%	Fairly Dark: forms firm ball: barley ribbons	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Fairly dark: will form ball: slightly crumbly	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak ball: crumbly	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Light color: powdery, dry	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
7/20/21	2	No ball – dry, crumbly	No ribbon	South side – middle of unit < 20%
7/20/21	2	Forms ball, slightly moist not crumbly	No ribbon, crumbles	North side – East portion of unit. ~40-45%
7/20/21	2	No ball – dry, crumbly	No ribbon	North side – west portion of unit < 20%
7/20/21	1	Forms slight ball-crumbly slightly moist	No ribbon	south side – west portion of unit. ~ 30%
7/20/21	1	No ball – dry, crumbly	No ribbon	north side – middle of unit < 20%
7/20/21	1	No ball - dry crumbly	No ribbon	south side – east side of unit < 20%

BCF Soil Moisture

Available Water	CLAY LOAM
100 % (Field Capacity)	Appears Very Dark, leaves slight moisture on hand when squeezed: will ribbon out about 2-inches
70% - 80%	Quite Dark: ribbons and slicks easily: makes plastic ball
60% - 65%	Fairly Dark: forms firm ball: ribbons ¼,½ -inch
50 %	Balls easily: small clods flatten out rather than crumble: ribbons slightly
35% - 40%	Slightly dark: forms weak balls: clods crumble
Less than 20% (Wilting Point)	Hard, Baked, cracked, light color

Note: Ball is formed by squeezing soil hard in fist. Ribbon is formed by rolling soil between thumb and forefinger

Date	MU #	Soil Ball Description	Soil Ribbon Description	Comments
09/10	2 596(A)	weak crumbly ball	Unable to form ribbons.	Difficult to probe soil, slightly dark at bottom of probe 35%, ½ - ⅔ probe deep
9/10	2 N96(B)	Unable to form ball from shallow probe Crumbles	no ribbon.	Unable to probe deeper than 4" soil crumbles and falls from probe on drill ≤35
9/10	2 N68(C)	Tip of probe had some darker soil. Unable to form ball	no Ribbon	4" deep. Difficult to probe, twists & bends... est < 30%

CITY OF EUGENE – WASTEWATER DIVISION
Procedure

Subject:	Irrigation Loop-Flushing	**Document No:**	WW - 2176
Reviewed By:	Randy Gray	**Original Date:**	11-22-2021
Approved By:	Michelle Miranda	**Date Reviewed/Revised:**	11-23-2021

I. Purpose

The Irrigation Loop Flushing Procedure provides direction and instructions for flushing the mix tank, Irrigation pumps and Irrigation loop following application with liquid biosolids.

II. Scope

Flushing the 16-inch diameter, 4.5 mile Biocycle Farm irrigation line and associated pumps and mix tank involves valving the irrigation system for recycled water use and flushing approximately three pipeline volumes of Recycled water (approximately 750,000 gallons).

This procedure applies to staff responsible for the operation of the Biocycle Management Facility and associated Biocycle Farm.

III. Safety Requirements

General safety requirements consisting of personal protection equipment.

IV. Procedure

Prior to flushing the irrigation loop and irrigation pumps with recycled water, re-valve all associated piping that had been set for liquid biosolids application to allow for W-2 irrigation.

Open the RWFM/HSST Isolation valve (33CV10-21) on the Recycled Water line to allow flow into the mix tank. The RWFM/Biocycle Farm Isolation Valve (33CV10-23) should be closed.

In the Irrigation Valve vault, the valving needs to be set up to create a counter clockwise directional flow through the irrigation pipeline and discharge into Lagoon #1. This entails closing the BF Irrigation Header Isolation Valve #2 (21HV37-14). The BF Irrigation Header Isolation Valve #1 (21HV37-13) should be open and the BF Irrigation Intertie Valve (21HV37-15) should be closed.

Open both Irrigation Line Flush Valves (valves 21HV38-21 on Lagoon #1 and 21HV38-20 located just outside the irrigation valve vault). These valves allow for liquid biosolids and flushing recycled water to be discharged into Lagoon #1.

Drain the mix tank prior to adding recycled water.

Communicate with operations at WPCF to obtain operational control of the W-2 pump (06PMP03-01) and verify on the SCADA system that it has been set to BMF Mode.

Set the PSI on the irrigation line to 60 psi and manually turn off the “Lag-Lag” irrigation pump so that it doesn’t automatically turn on with lower pressure in the line and pump down the mix tank.

Start the system

The mix tank will begin to fill. Once the lower limit of the mix tank has been reached the irrigation tanks should start up automatically. Once the system is started, recycled water should be pumped from the mix tank via the irrigation pumps, through the irrigation loop, and discharged to Lagoon #1. Visually verify discharge in Lagoon#1 from Flushing Valve 21HV38-21. Monitor the tank level during the flush. If pressure in the line is not being maintained during the flush, partially close the Irrigation Flush valve on Lagoon #1 (21HV38-21) to add pressure to the system.

The 16-inch diameter, 4.5-mile Biocycle Farm irrigation supply pipeline has a hydraulic capacity of approximately 250,000 gallons. Allow for three pipeline volumes of water (approximately 750,000 gallons) to be flushed through the system.

The amount of water delivered through the system can be monitored via a flow meter on the irrigation line and viewed on the SCADA system.

Once three pipe volumes have been delivered, the flush can be completed. Re-valve for irrigation with recycled water.

V. Roles and Responsibilities (if applicable)

It is the responsibility of the operator to properly flush all equipment prior to reinitiating recycled water irrigation.

VI. References

None

Oregon Water Resources Department

Municipal Reclaimed Water Registration Form

A water use permit may not be required if the water being used is reclaimed water as defined in ORS 537.131 ***and*** *the reclaimed water use is both authorized by the Oregon Department of Environmental Quality (DEQ)* ***and registered*** *with Oregon Water Resources Department (WRD)*(ORS 537.132). *Currently there is no fee for registering.*

Complete and send this Registration Form ***to the DEQ permit writer*** *managing the wastewater treatment facility discharge permit. DEQ will review and sign this Registration Form prior to sending it on to WRD in Salem. A response letter will be sent by WRD to all parties within 60 days of receipt.*

Instructions *are available to guide you. If you need assistance, please call 503-986-0900 and ask for the "Water Reuse Coordinator" or contact the local watermaster in your county. Insert "N/A" if the requested information does not apply to your situation.*

1. Name of "Registrant". Who will use the reclaimed water?

Name of Reclaimed Water User: MWMC - Eugene/Springfield Water Pollution Control Facility

County where reclaimed water use will occur: Lane County

Mail Address: 410 River Avenue (*Street/P.O. Box*) Eugene (*City*) Oregon (*State*) 97404 (*Zip*)

Daytime Telephone: (541) 682-8600 *E-mail:* MMiranda@eugene-or.gov

2. Does the reclaimed water user own the land where the use will occur?

☒ YES ☐ NO If no, provide the landowner's name and contact information.

Landowner Name: _____

Mail Address: _____ (*Street/P.O. Box*) (*City*) (*State*) (*Zip*)

Daytime Telephone: _____ *E-mail:* _____

3. Are there existing water rights on the same land where the use will occur?

☒ YES (provide information below) ☐ NO

Application No. 14865 *Permit No.* G-13718

Certificate No. 94261 *Decree vol. & pg.* max. rate 0.84 cfs

Will the reclaimed water be used ***instead of*** *existing water rights OR used to* ***supplement*** *the continued use of the existing water rights?* The water is used to supplement the water right at the Biosolids

4. Has DEQ issued a Municipal Wastewater Treatment Facility Discharge Permit authorizing the use of reclaimed water? (*If yes, provide permit number*)

☒ YES *NPDES Permit No.* 102486 or *WPCF Permit No.* 55999

Permit Effective Date: May 1, 2002 *Permit Expiration Date:* December 31, 2006

DEQ Region: (Check one) ☒ *Northwest Region* ☐ *Eastern Region* ☐ *Western Region*

☐ NO *Permit application was submitted to DEQ, but not yet issued.*

☐ NO *Permit application has not been submitted to DEQ.*

5. Who is treating and supplying the reclaimed water to the user?

Name of Supplier: MWMC - E/S WPCF *Telephone No.* (541) 682-8600

Treatment Facility Name: MWMC - E/S WPCF *Telephone No.* (541) 682-8615

Mail Address: 410 River Ave (*Street/P.O. Box*) Eugene (*City*) Oregon (*State*) 97404 (*Zip*)

6. Which water provider supplies potable municipal water to the city/community that produces the sewage entering the treatment facility?

Municipal Water Provider: EWEB / SUB(541-746-8451) *Telephone No.* (541) 685-7000

Source(s) of Municipal Water: EWEB - McKenzie River / SUB - Groundwater

(stream name, groundwater, and/or reservoir name)

7. Will the use of reclaimed water occur inside or outside the water service boundaries of the potable municipal water provider identified above in Question 6?

☒ INSIDE ☐ OUTSIDE

8. What is the length in years of the agreement/contract between the reclaimed water user and the reclaimed water supplier? NA

Describe any conditions in the agreement that limit use of the reclaimed water.
MWMC is the supplier and the user of the reclaimed water.

9. Please describe the transmission system that delivers reclaimed water from the wastewater treatment facility to the place of reclaimed water use.
Recycled water is pumped from the treatment plant to the Biosolids Management Facility (BMF) through a 5.5 mile force main. A 2,800 gpm/150 psi recycled water pump is used.

(Include type of construction of diversion works/pump capacity, length and dimensions of supply ditches/ pipelines)

10. What is the Intended Use(s) of Reclaimed Water?

Irrigation of poplar trees and process water for belt filter press wash water when dewatering.

(irrigation, aquifer recharge, wetlands, industrial, cooling, aquifer storage & recovery, etc.)

Irrigation Total Acres: 395 *What type of crop?* Poplar Trees

(hay, pasture, golf course, wood fiber, etc.)

What is the irrigation application system? Hose reel irrigation system

(flood, center pivot, wheel line, drip, micro-sprinklers)

How much Reclaimed Water will be used? 2,800 gpm

(cubic feet per second, OR gallons per minute)

Date use began or will begin: NA *Period of use (month/day): from* May 1 *to* Oct 31

11. What are the water user's motivations to use reclaimed water?

- ☐ My existing water rights are "junior" and not always reliable.
- ☐ Another water source is available, but reclaimed water is less expensive.
- ☐ Reclaimed water is the only source available and enables the use listed in Question 10.
- ☐ Reclaimed water allows a WRD transfer of existing water rights to a different location.
- ☑ Reclaimed water use reduces demand on the local municipal water supply.
- ☐ To assist the treatment facility in meeting DEQ regulatory permit requirements.
- ☐ To recharge the aquifer or store water in the aquifer for future recovery.
- ☑ Other (describe): Provide supplemental water supply for crop irrigation.

12. Describe the historic reclaimed water disposal method.

A) Into which stream was the reclaimed water discharged? Willamette River

B) Has the reclaimed water been discharged into the stream for 5 or more years?

■ YES ☐ NO

C) Where did the treated wastewater historically enter the stream?

River mile 178, same location as the outfal for the facility's treated effluent.

(Township, Range and Section, or distance from landmark, or river mile, or Lat/Long)

D) Does the amount (rate in gpm or cfs) of reclaimed water proposed for use under this registration represent more than 50% of the total average annual flow of the stream?

☐ YES ■ NO ☐ UNKNOWN

Source of information used to answer this? USGS

13. Is the required map attached showing the reclaimed water transmission system and place of use? ■ YES ☐ NO (If No, please prepare and attach map).

The Registration Form is not complete without an adequate map.
See map requirement explanation on page 4.

14. MAP REQUIREMENTS:

This registration must be accompanied by a map, or maps, to show the location of the wastewater treatment facility, location of reclaimed water transmission system (pipelines, canals, etc.) and the place of reclaimed water use. Features of the map(s) should include the following:

- A north arrow.
- Drawn to scale at not less than 4" = 1 mile, with the scale identified.
- Township, Range, Section, Quarter-Quarters, and tax lot number(s).
- Place of use shown by Quarter-Quarter section with shading or diagonal lines.
- Acres, if land application, per Quarter-Quarter section (approximate if not certain).
- Location of main canals or pipelines to and within the reclaimed water use area.
- Streams and roads identified if they cross through the map.
- Other obvious features that would help someone in the field locate the place of use.
- A legend.

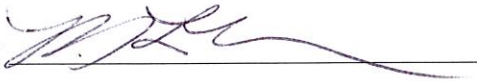
A map showing the wastewater treatment facility, transmission system, and place of use at a scale of 4" = >1 mile is fine **only if a second map is provided showing the place of use at not less than 4" = 1 mile.*

15. ADDITIONAL COMMENTS: Provide additional information here or attach additional pages.

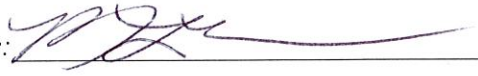
16. Signatures of Registrant and Reclaimed Water Supplier:

I/We certify that the information provided in this Registration Form is an accurate representation of the proposed reclaimed water use to the best of my knowledge:

Registrant Printed Name: Michelle Miranda *Title:* Operations Manager

Registrant Signature:  *Date:* 11/23/2021

Supplier Printed Name: Michelle Miranda *Title:* Operations Manager

Supplier Signature:  *Date:* 11/23/2021

***NOTE:** Once completed and signed, keep a copy and **send this form to the DEQ permit writer** responsible for the wastewater treatment facility permit. DEQ will sign and forward the form to WRD in Salem. A response letter will be sent by WRD to all parties within 60 days.*

This section is to be completed by DEQ

17. Signature of DEQ Water Quality Manager:

Date registration form received at DEQ:_____

Pursuant to ORS 537.132 DEQ has:

a) **Authorized the use of reclaimed water (referred to by DEQ regulations as "recycled water") as evidenced by the NPDES or WPCF permit issued and described below.**

*Permit Number:*_____ *DEQ File Number:*_____

*Printed DEQ Permit Writer's Name:*_____

*Mail Address:*_____
Street/P.O. Box *City* *State* *Zip*

*Telephone:*_____ *E-mail:*_____

b) **Consulted with State Department of Fish and Wildlife and determined this use of reclaimed water shall not have a significant negative impact on fish or wildlife.**

*ODFW contact name:*_____

*ODFW contact phone number:*_____

c) **Determined the use of reclaimed water is intended to improve the water quality of the receiving stream.**

*The reclaimed water is (e.g. too warm for salmonids):*_____

_____

I certify the provisions of ORS 537.132(1)(a)(b) and (c) for this application are satisfied.

_____ Date_____
DEQ Water Quality Manager Signature

_____
DEQ Water Quality Manager's printed name

Once signed by DEQ, this completed form is to be sent to:

Oregon Water Resources Department
C/O Water Reuse Coordinator
725 Summer St. NE, Suite A
Salem, OR 97301-1266