Ontario

DRINKING WATER WORKS PERMIT

Permit Number: 171-201
Issue Number: 2

Pursuant to the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this drinking water works permit is issued under Part V of the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32 to:

The Corporation of the Township of Bonnechere Valley

49 Bonnechere St. E.
Eganville ON, K0J 1T0

For the following municipal residential drinking water system:

Eganville Drinking Water System

This drinking water works permit includes the following:

Schedule	Description
Schedule A	Drinking Water System Description
Schedule B	General
Schedule C	All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system
Schedule D	Process Flow Diagrams

DATED at TORONTO this 22nd day of June, 2016

Signature

Aziz Ahmed, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Description

System Owner	**The Corporation of the Township of Bonnechere Valley**
Permit Number	**171-201**
Drinking Water System Name	**Eganville Drinking Water System**
Schedule A Issue Date	**June 22nd, 2016**

1.0 System Description

1.1 The following is a summary description of the works comprising the above drinking water system:

Overview

The **Eganville Drinking Water System** consists of one (1) drinking water treatment plant, one (1) standpipe and approximately 13 kilometers of piping, ranging in diameter from 150 mm to 250 mm in diameter.

Eganville Water Treatment Plant

Treatment Plant

Name	Eganville Water Treatment Plant
Street Address	401 Water St., Village of Eganville, Township of Bonnechere Valley
UTM Coordinates	NAD27 UTM Zone 18, 335260.00 m E, 5040780.00 m N
System Type	Surface Water Treatment Plant
Dimensions	24.3 m by 32.6 m
Notes	Housing low lift pumping facilities, two (2) dual train packaged water treatment plants, granular activated carbon (GAC) filters, disinfection facilities, GAC filter pumping facilities, high-lift pumping facilities, dry chemical room, clear water storage area, laboratory, workshop, loading area, generator room, lunch room, office computer room, storage room, polyelectrolyte room, coagulant room and sodium hypochlorite room

Surface Water Supply

Intake Facilities

Description	Intake crib and pipe
Location	Situated approximately 30 m offshore
Notes	One (1) 560 mm adjustable polyethylene intake complete with intake structure
	One (1) 400 mm diameter raw water polyethylene intake pipe, approximately 61 m long

Low Lift Works

Low Lift Pumping Facility

Description	Low Lift Pumping Facility
Capacity	Firm capacity of 26.0 L/s
	Three (3) vertical turbine pumps each rated at 13L/s at 186 kPa total dynamic head
Dimensions	Wet well with dimensions of 2.16 m by 9.66 m, located inside the Plant
Notes	Equipped with two (2) static removable screen and associated appurtenances including discharge headers and electrical and control system
	A 150mm diameter static mixer with four triple action elements in the raw water line downstream of the chemical injection points

Coagulation/Flocculation/Clarification, Filtration and GAC

Coagulation/Flocculation/Clarification and Filtration Facilities

Description	Two (2) packaged water treatment plants each capable of treating a maximum flow rate of 1035 m3/d, each providing treatment processes consisting of coagulation, flocculation, sedimentation, and filtration
Equipment (on each train)	One (1) clarifier 3.66m by 3.73m by 3.51m high, comprised of a centre cone draft tube, sludge recirculation and mixing zone, flocculation zone and settling zone, equipped with floc barriers and clarified water collector flume
	One (1) rapid rate dual media gravity filter with two (2) filter compartments, each with 3 m^2 filter area, for a maximum loading rate of 7.2 m/h at a flow of 43.1 m^3/h, complete with air scour and gravity backwash systems (backwash tanks filled from the high lift pump discharge header) including controls
Notes	None

Filtered Water Works

Description	Filtered Water Works
Location	Between the packaged plants and the Granular activated carbon filters
Dimensions	Wet well with dimensions of 5.50m by 5.85m by 2.30m Side Water Depth (SWD) located below the pant enclosure building
Capacity	Three (3) submersible GAC filter pumps located in the filtered water well, each rated at 13.2 L/s at 93 kPa TDH
Notes	Pumps discharge to a splitter box upstream of the two (2) GAC filters

GAC Filters

Description	Two granular activated carbon (GAC) filters
Dimensions	Each 2.75 m in diameter, for a maximum loading rate of 7.2 m/h at a low of 43.1 m^3/h
Notes	Filters can be by-passed. Two (2) compartments consisting of GAC media, a gravity backwash storage compartment (filled from the high lift pump discharge header) and all associated appurtenances and controls

Clearwells

Description	A treated water reservoir
Location	Located below the plant enclosure building
	Three (3) clear wells with the following dimensions: - 5.85 m by 10.40 m (Clear Well No. 1) - 5.85 m by 16.30 m (Clear Well No. 2) - 4.90 m by 12.20 m (Clear Well No. 3)
Notes	If the overflow level back to low lift pump well is used, the side water depth would be 3.5m for all clearwells as they are interconnected

High Lift Works

High Lift Pumps

Description	Three (3) vertical turbine high lift pumps
Capacity	Two (2) located over High Lift Well No. 1 and one (1) located over High Lift Well No. 2, each rated at 26 L/s at 637 kPa and TDH
Dimensions	Consisting of two (2) high lift wells (High Lift Well No. 1 and High Lift Well No. 2 each 3.20 m by 5.85 m by 2.68 m SWD
Notes	

Waste Residual Management

Filter Backwash/Filter-to-Waste/Clarifier Sludge/Waste Handling Facility

Description	A waste handling facility
Equipment	A 4.9 m by 7.5 m surge tank to collect clarifier sludge, spent backwash water from the rapid rate gravity filters and GAC filters, and filter-to-waste from the rapid rate gravity filters
	A 3.2 m by 4.9 m by 3.33 m SWD settling tank with a capacity of 52.2 m^3
	A submersible pump rated at 5.4 L/s at 44 kPa TDH to convey waste from the surge tank to the settling tank
	A submersible pump rated at 5.4 L/s at 44 kPa TDH to discharge the waste from the settling tank to an existing sewage pump station
Notes	

Chemical Addition

PHAS (alum based coagulant)

Description	Coagulant feed system
Feed Point	From a 400 L day tank to raw water piping upstream of the clarifiers and one (1) 24,200 L coagulant storage tank
Equipment	Consisting of two (2) chemical metering pumps (one duty, one standby) each rated at 18.9 L/h
Notes	

Polyelectrolyte

Description	Polyelectrolyte Feed System
Feed Point	Raw water piping upstream of the clarifiers
Equipment	Two (2) polyelectrolyte feed systems (duty and standby), standby system consisting of 1 chemical feed pump rated at 18.93 L/h, duty system consisting of 3 chemical feed pumps with 2 pumps at 9.5 L/h and 1 pump at 75.7 L/h each system complete with wetting unit, aging and mixing unit, with a solution metering tank for the two systems
Notes	

Chlorine (pre-chorination)

Description	One (1) sodium hypochlorite disinfection system for pre-chlorination
Feed Point	Upstream of clarifiers
Equipment	Consist of two (2) chemical metering pumps (one duty, one spare) each rated at 9.5 L/h, one (1) 400 L capacity solution tank and associated equipment, instrumentation and controls
Notes	Two (2) 1100 L interconnected sodium hypochlorite storage tanks and associated equipment supply both pre and post systems

Chlorine (post-chlorination)

Description	One (1) sodium hypochlorite disinfection system for post-chlorination
Feed Point	Upstream of the clear water reservoir (post-chlorination)
Equipment	Consist of two (2) chemical metering pumps (one duty, one spare) each rated at 9.5 L/h, one (1) 400 L capacity solution tank and associated equipment, instrumentation and controls, including a chlorine residual analyzer for continuous measurement of free chlorine residual in treated water prior to distribution
Notes	

Emergency Power

Backup Power Supply

Description	One (1) stand-by power diesel generator rated at 300 kW complete with (2) 1136L diesel fuel tanks
Notes	

Instrumentation and Control

SCADA System

Description	Contains monitoring and control systems including continous chlorine residual and turbidity indicators, raw and treated water flow meters, and tank water levels, electrical and mechanical equipment, heating, ventilation, control and alarm systems
Notes	Includes a PLC control panel and MCC

Elevated Storage Tanks

Standpipe

Location	142 Bruce Street, Eganville
UTM Coordinates	NAD83 Zone 18 336411 E, 5045492 N
Description	Bruce Street Standpipe
Dimensions	Total volume is 1,364 m^3
	Useable volume is 337 m^3
Equipment	It includes a small underground concrete chamber that houses valving for the fill and drain pipes for the standpipe
Notes	The standpipe has a new wireless level control system has now been installed on the elevated storage reservoir in order to monitor the water level from the water plant in conjunction with the new plant SCADA system
	The standpipe provides pressure equalization and fire flow storage within the system and supplies water to the system when the high lift pumps are cycled off

Watermains

1.2 Watermains within the distribution system comprise:

1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.

Table 1: Watermains

Column 1 Document or File Name	Column 2 Date
Township of Bonnechere Valley Eganville Water Distribution System	January 19, 2016

1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

Schedule B: General

System Owner	**The Corporation of the Township of Bonnechere Valley**
Permit Number	**171-201**
Drinking Water System Name	**Eganville Drinking Water System**
Schedule B Issue Date	**June 22nd, 2016**

1.0 Applicability

1.1 In addition to any other requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence.

1.2 The definitions and conditions of the licence shall also apply to this drinking water works permit.

2.0 Alterations to the Drinking Water System

2.1 Any document issued by the Director as a Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance, where applicable, with the conditions of this drinking water works permit and the licence.

2.2 All Schedule C documents issued by the Director for the drinking water system shall form part of this drinking water works permit.

2.3 All parts of the drinking water system in contact with drinking water which are:

2.3.1 Added, modified, replaced, extended; or

2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination,

shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:

a) The ministry's Watermain Disinfection Procedure, effective December 22, 2016;
b) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
c) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and
d) AWWA C654 – Standard for Disinfection of Wells.

2.4 The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:

2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;

2.4.2 Any Schedule C to this drinking water works permit respecting works other than watermains; or

2.4.3 Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

2.5 For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

2.5.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;

2.5.2 Constitutes maintenance or repair of the drinking water system; or

2.5.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.

2.6 The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.

2.7 For greater certainty, any alteration to the drinking water system made in accordance with this drinking water works permit may only be carried out after other legal obligations have been complied with including those arising from the *Environmental Assessment Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act, 2001* and *Greenbelt Act, 2005*.

3.0 Watermain Additions, Modifications, Replacements and Extensions

3.1 The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:

3.1.1 The design of the watermain addition, modification, replacement or extension:

a) Has been prepared by a Professional Engineer;

b) Has been designed only to transmit water and has not been designed to treat water;

c) Satisfies the design criteria set out in the Ministry of the Environment and Climate Change publication “Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – June 2012”, as amended from time to time; and

d) Is consistent with or otherwise addresses the design objectives contained within the Ministry of the Environment and Climate Change publication “Design Guidelines for Drinking Water Systems, 2008”, as amended from time to time.

3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.

3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.

3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.

3.1.6 The owner of the drinking water system consents in writing to the watermain addition, modification, replacement or extension.

3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.

3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.

3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:

3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;

3.2.2 Has a nominal diameter greater than 750 mm;

3.2.3 Results in the fragmentation of the drinking water system; or

3.2.4 Connects to another drinking water system, unless:

a) Prior to construction, the owner of the drinking water system seeking the connection obtains written consent from the owner or owner's delegate of the drinking water system being connected to; and

b) The owner of the drinking water system seeking the connection retains a copy of the written consent from the owner or owner's delegate of the drinking water system being connected to as part of the record that is recorded and retained under condition 3.3.

3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:

3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration", as published by the Ministry of the Environment and Climate Change, prior to the watermain addition, modification, replacement or extension being placed into service; and

3.3.2 Retained for a period of ten (10) years by the owner.

3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

3.4.2 Constitutes maintenance or repair of the drinking water system.

3.5 The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.

3.6 The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

4.0 Minor Modifications to the Drinking Water System

4.1 The drinking water system may be altered by adding, modifying or replacing the following components in the drinking water system:

4.1.1 Raw water pumps and treatment process pumps in the treatment system;

4.1.2 Coagulant feed systems in the treatment system, including the location and number of dosing points;

4.1.3 Valves;

4.1.4 Instrumentation and controls, including SCADA systems, and software associated with these devices;

4.1.5 Filter media, backwashing equipment and under-drains in the treatment system; or,

4.1.6 Spill containment works.

4.2 The drinking water system may be altered by adding, modifying, replacing or removing the following components in the drinking water system:

4.2.1 Treated water pumps and associated equipment;

4.2.2 Re-circulation devices within distribution system storage facilities;

4.2.3 In-line mixing equipment;

4.2.4 Chemical metering pumps and chemical handling pumps;

4.2.5 Chemical storage tanks (excluding fuel storage tanks) and associated equipment; or,

4.2.6 Measuring and monitoring devices that are not required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry of the Environment and Climate Change.

4.3 The drinking water system may be altered by replacing the following:

4.3.1 Raw water piping, treatment process piping or treated water piping within the treatment subsystem;

4.3.2 Fuel storage tanks and spill containment works, and associated equipment; or

4.3.3 Coagulants and pH adjustment chemicals, where the replacement chemicals perform the same function;

a) Prior to making any alteration to the drinking water system under condition 4.3.3, the owner shall undertake a review of the impacts that the alteration might have on corrosion control or other treatment processes; and

b) The owner shall notify the Director in writing within thirty (30) days of any alteration made under condition 4.3.3 and shall provide the Director with a copy of the review.

4.4 Any alteration of the drinking water system made under conditions 4.1, 4.2 or 4.3 shall not result in:

4.4.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;

4.4.2 The bypassing of any unit process within a treatment subsystem;

4.4.3 A deterioration in the quality of drinking water provided to consumers;

4.4.4 A reduction in the reliability or redundancy of any component of the drinking water system;

4.4.5 A negative impact on the ability to undertake compliance and other monitoring necessary for the operation of the drinking water system; or

4.4.6 An adverse effect on the environment.

4.5 The owner shall verify in writing that any addition, modification, replacement or removal of drinking water system components in accordance with conditions 4.1, 4.2 or 4.3 has met the requirements of the conditions listed in condition 4.4.

4.6 The verifications and documentation required in condition 4.5 shall be:

4.6.1 Recorded on "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System", as published by the Ministry of the Environment and Climate Change, prior to the modified or replaced components being placed into service; and

4.6.2 Retained for a period of ten (10) years by the owner.

4.7 For greater certainty, the verification requirements set out in conditions 4.5 and 4.6 do not apply to any addition, modification, replacement or removal in respect of the drinking water system which:

4.7.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

4.7.2 Constitutes maintenance or repair of the drinking water system.

4.8 The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

5.0 Equipment with Emissions to the Air

5.1 The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the atmosphere:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers and absorbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Venting for an ozone treatment unit;

5.1.12 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; or

5.1.13 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

5.2 The owner shall not add, modify or replace a drinking water system component set out in condition 5.1 for an activity that is not directly related to the treatment and/or distribution of drinking water.

5.3 The emergency generators identified in condition 5.1.13 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.

5.4 The owner shall prepare an emission summary table for nitrogen oxide emissions only, for each addition, modification or replacement of emergency generators identified in condition 5.1.13.

Performance Limits

5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.13 is operated at all times to comply with the following limits:

5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;

5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive populations shall not exceed the applicable point of impingement limit, and at non-sensitive populations shall not exceed the Ministry of the Environment and Climate Change half-hourly screening level of 1880 ug/m^3 as amended; and

5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-300, as applicable.

5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.

5.7 The owner shall document how compliance with the performance limits outlined in condition 5.5.3 is being achieved, through noise abatement equipment and/or operational procedures.

5.8 The verifications and documentation required in conditions 5.6 and 5.7 shall be:

5.8.1 Recorded on “Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere”, as published by the Ministry of the Environment and Climate Change, prior to the additional, modified or replacement equipment being placed into service; and

5.8.2 Retained for a period of ten (10) years by the owner.

5.9 For greater certainty, the verification and documentation requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:

5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

5.9.2 Constitutes maintenance or repair of the drinking water system.

5.10 The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.

6.0 Previously Approved Works

6.1 The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:

6.1.1 An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification, replacement or extension and operation of that part of the municipal drinking water system;

6.1.2 The approval expired by virtue of subsection 36(4) of the SDWA; and

6.1.3 The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

7.0 System-Specific Conditions

7.1 The following are authorized under this permit:

Not Applicable

8.0 Source Protection

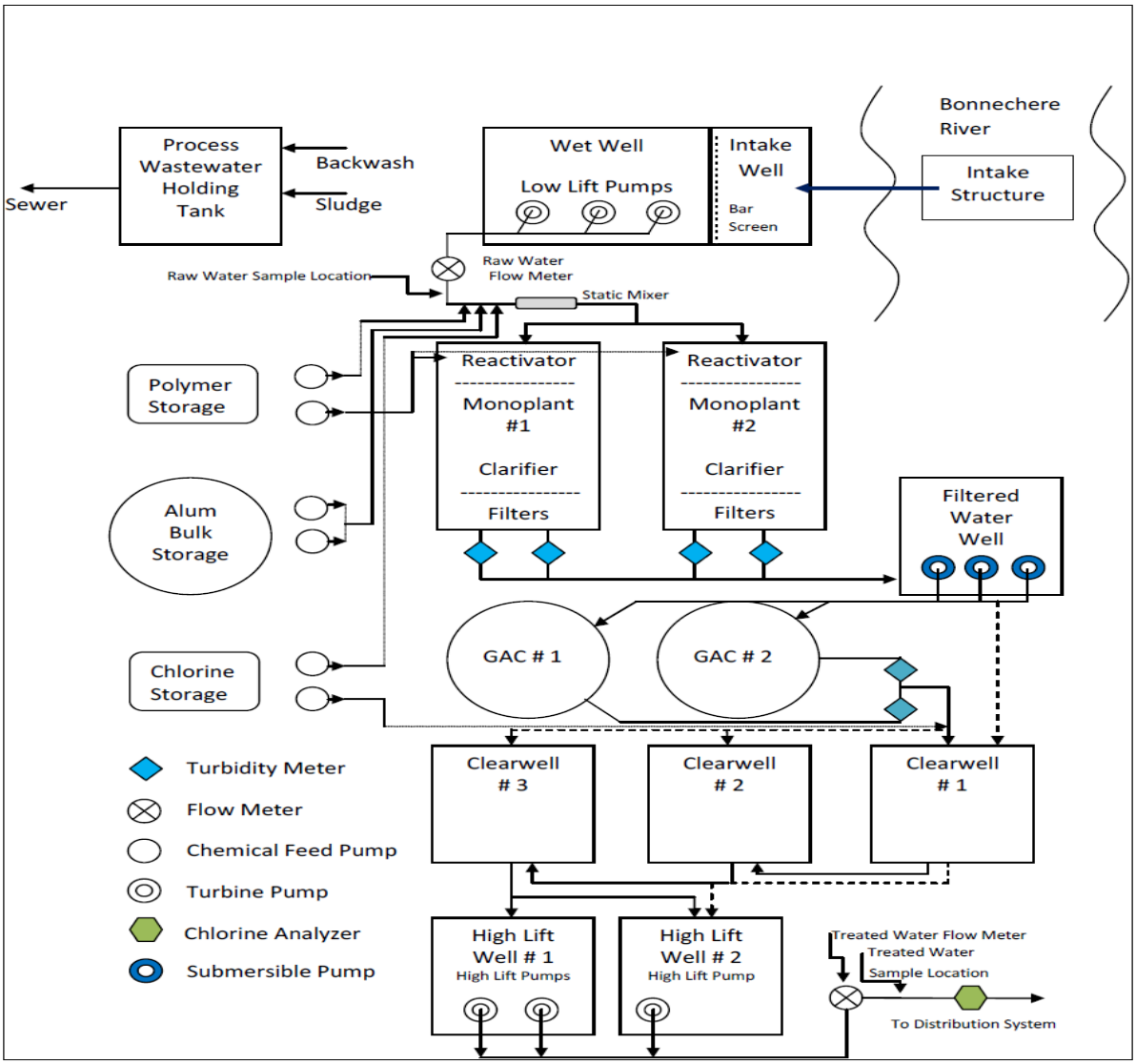
8.1 Not Applicable

Schedule D: Process Flow Diagrams

System Owner	**The Corporation of the Township of Bonnechere Valley**
Permit Number	**171-201**
Drinking Water System Name	**Eganville Drinking Water System**
Schedule D Issue Date	**June 22nd, 2016**

1.0 Process Flow Diagrams

Eganville Water Treatment Plant



[Source: Operational Plan, Revision 12, July 28, 2015]