



OPERATIONAL PLAN

Pickle Lake Drinking Water System

Revision 6, 06-Mar-2017

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0 DWQMS Matrix

The DWQMS Matrix provided below indicates how the PLAN requirements of Ontario's Drinking Water Quality Management Standard are addressed by the Township of Pickle Lake. DWQMS Elements are addressed through a combination of documentation which includes this Operational Plan and DWQMS Procedures. DWQMS Procedures may in turn reference certain Township of Pickle Lake policies and procedures, which are similarly used to address the requirements of the Standard. PLAN requirements not directly addressed within this Operational Plan have been highlighted.

This matrix is intended to facilitate the understanding of the reader with respect to the structure of the Township of Pickle Lake's QMS. Additionally, this matrix will act to facilitate internal and external auditing processes.

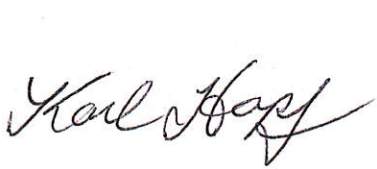



DWQMS Element	Document
1 – Quality Management System	Operational Plan
2 – Quality Management System Policy	Operational Plan
3 – Commitment and Endorsement	Operational Plan
4 – QMS Representative	Operational Plan
5 – Document & Records Control	QP-01 (Document & Records Control)
6 – Drinking-Water System	Operational Plan
7 – Risk Assessment	QP-02 (Risk Assessment & Risk Assessment Outcomes)
8 – Risk Assessment Outcomes	QP-02 (Risk Assessment & Risk Assessment Outcomes)
9 – Organizational Structure, Roles, Responsibilities and Authorities	Operational Plan
10 – Competencies	Operational Plan
11 – Personnel Coverage	QP-03 (Personnel Coverage)
12 – Communications	QP-04 (QMS Communications)
13 – Essential Supplies and Services	QP-05 (Essential Supplies and Services)
14 – Review and Provision of Infrastructure	QP-06 (Review and Provision of Infrastructure)
15 – Infrastructure Maintenance, Rehabilitation and Renewal	Operational Plan
16 – Sampling, Testing and Monitoring	QP-07 (Sampling, Testing and Monitoring)
17 – Measurement and Recording Equipment Calibration and Maintenance	QP-08 (Measurement and Recording Equipment Calibration and Maintenance)
18 – Emergency Management	QP-09 (Emergency Management)
19 – Internal Audits	QP-10 (Internal Audits)
20 – Management Review	QP-11 (Management Reviews)
21 – Continual Improvement	Operational Plan

1 Quality Management System

The Drinking Water Quality Management System (QMS) for the Pickle Lake Drinking Water System is documented in this Operational Plan as part of the Township of Pickle Lake's efforts to ensure that clean, safe, and reliable drinking water is supplied to all customers served by this system. The development and continual improvement of the Plan will help to ensure that all regulatory requirements are met and that consumers can be confident that their drinking water will be protected through the effective application of the QMS. This Operational Plan was developed to meet the Ministry of the Environment's Drinking Water Quality Management Standard.

2 Commitment and Endorsement

The Township of Pickle Lake supports the implementation, maintenance, and continual improvement of a drinking water Quality Management System for the Pickle Lake Drinking Water System, as documented in this Operational Plan. In its role as both owner and operating authority, the Township of Pickle Lake acknowledges the need for and supports the provision of sufficient resources to maintain and continually improve the QMS. All of the undersigned persons hereby endorse this Operational Plan:

Signature and Title:	Date:
 Karl Hopf, Mayor Owner Representative	^{K.H.} Oct 3 / 2016
 Erkki Pohjolainen, Clerk Treasurer Operating Authority Representative (Top Management)	Oct. 3, 2016 E.P.
 Wayne Morrison, Public Works Superintendent Operating Authority Representative (Top Management)	Monday, Oct 3 rd W.M.
 Kyle Clemmer, Water-Wastewater Operator Operating Authority Representative (QMS Representative)	03/10/2016. K.C.

3 Quality Management System Policy

The Corporation of the Township of Pickle Lake, including its Mayor, Council, Management and Facility Personnel, are committed to the following:

- (1) Providing the consumer with a consistent supply of safe drinking water;
- (2) Complying with all applicable legislation and regulations; and,
- (3) Maintaining and continually improving the Quality Management System.

4 QMS Representative

The Water-Wastewater Operator acts as the QMS Representative for the Pickle Lake Drinking Water System. As the QMS Representative, the Water-Wastewater Operator is responsible for:

- (1) Administering the QMS, including establishing and maintaining processes and procedures required by the QMS;
- (2) Controlling documents and records, including ensuring that current versions of QMS documents are being used at all times and initiating and approving various QMS Procedures (QPs);
- (3) Ensuring that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the system;
- (4) Promoting awareness of the Quality Management System throughout the operating authority, including emphasizing that all personnel have roles and responsibilities under the QMS; and,
- (5) Reporting on the performance of the QMS to Top Management and identifying opportunities for improvement.

5 Document & Records Control

Refer to DWQMS Procedure QP-01 (Document & Records Control).

6 Drinking-Water System

6.1 General Process Description

Classified as a Class II Water Distribution and Supply System with a rated capacity of 3,931 m³/day, the Pickle Lake Drinking Water System provides a potable water supply to the community of Pickle Lake. The system consists of two (2) groundwater wells (Wells 1 and 2) utilizing free chlorine disinfection for treatment, an elevated water tower, and distribution system. The system is owned and operated by the Corporation of the Township of Pickle Lake, and it is not connected to any other systems. The following subsections provide descriptions of the main components of the Pickle Lake Drinking Water System.

6.2 Well 1

Well 1 is a drilled groundwater production well extending 27 m below ground level with a 300 mm diameter casing. The corresponding pump house is located at 3 Trailer Park (Loop) Road. The well is equipped with a vertical turbine pump rated at 27.3 L/s at a TDH of 72 m. Groundwater from Well 1 is discharged to a 150 mm pipe before connecting to a common supply line that accepts raw groundwater from Well 2. Within the Well 1 pump house there exists bypass piping allowing for water to bypass the chlorine injection point. The bypass is secured so that it cannot be opened and signage is present.

6.3 Well 2

Well 2 is a drilled groundwater production well extending 27 m below ground level with a 200 mm diameter casing. The corresponding pump house is located at 3 Trailer Park (Loop) Road. The well is equipped with a vertical turbine pump rated at 18.2 L/s at a TDH of 72 m. Groundwater from Well 2 is discharged to a 150 mm discharge pipe which delivers raw water to a common supply line for subsequent treatment located at Well 1. The discharge pipe is equipped with a flow meter for measuring the amount of groundwater withdrawn from Well 2.

6.4 Free Chlorine Disinfection

As a groundwater source, free chlorine disinfection must achieve at least 2-log removal of viruses prior to water being distributed to consumers. Within the Well 1 pump house, disinfectant is injected into the common supply line before water is directed to a dedicated chlorine contact loop. This loop consists of 67 m of 900 mm diameter concrete pressure pipe, and has been designed such that a minimum of 15.6 minutes chlorine contact time is provided at peak flows (45.55 L/s). The loop also includes a 25 mm diameter copper sample line that extends from the end of the loop to the Well 1 pump house. The disinfection system consists of one (1) 160 L sodium hypochlorite solution tank and two (2) chemical metering pumps (duty and standby) each rated at 6.3 L/h, complete with alarm and automatic switchover capability.

Two (2) free chlorine residual analyzers located within the Well 1 pump house continuously monitor the free chlorine residual. One of the analyzers measures the residual immediately downstream of disinfectant application, while the other measures the residual after primary disinfection has been achieved (i.e. downstream of the chlorine contact loop). The former analyzer is configured to lockout the well pumps in the event of a low chlorine residual. The latter analyzer samples from the previously mentioned sample line.

6.5 Alarm Systems

The treatment facility is monitored by an alarm system on a continuous basis, with a Programmable Logic Controller (PLC) system that is connected to the alarm system. The PLC sends a signal to the alarm system that will relay the signal to the automatic dialer to notify an operator when alarm conditions are encountered (i.e. a low free chlorine residual).

6.6 Standby Power

Standby power to the facilities is provided by using a mobile diesel generator that is stored at the Water Pollution Control Plant.

6.7 Process Wastewater

Wastewater produced by the treatment facilities (i.e. pump-to-waste) is directed to a system of drains discharging to a leaching (soak away) pit located 10 m south of the Well 1 pump house.

6.8 Water Tower & Distribution System

The wells pump water directly to the distribution system and water tower. The distribution system consists of approximately 6.6 km of watermains, 31 fire hydrant and associated valves, 115 commercial connections and 213 residential connections. The distribution system serves approximately 450 residents.

The Pickle Lake Water Tower is located on Ohman Street South and serves to maintain positive pressure for the distribution system. The level of the reservoir serves as the trigger for the start and stop of the well pumps. The water tower has a total useable volume of 888 m³.

6.9 Source Water Characterization

The source water supply for the Pickle Lake DWS includes the groundwater supply for each of the two (2) active wells. Source water quality is characterized as follows:

Well 1 – Source Water Characterization (Year – 2014)			
Parameter	Minimum	Maximum	Annual Average
Temperature (°C)	4.8	8.8	7.8
Turbidity (NTU)	0.04	0.09	0.07
pH	6.8	8.8	7.8
E. coli (MPN/100 mL)	<1	<1	<1
Total Coliforms	<1	<1	<1

Well 2 – Source Water Characterization (Year – 2014)			
Parameter	Minimum	Maximum	Annual Average
Temperature (°C)	4.2	9.9	7.1
Turbidity (NTU)	0.05	0.07	0.06
pH	7.7	8.9	8.3
E. coli (MPN/100 mL)	<1	<1	<1
Total Coliforms	<1	<1	<1

Source water for each of the wells is low in turbidity and slightly basic, with temperature generally remaining constant throughout the year. Routine microbiological analyses indicate an absence of *E. coli* and total coliforms. As is typical for a groundwater supply, there is a general lack of seasonal or event-driven fluctuations in source water quality.

One potential event-driven fluctuation includes fuel leaks and chemical spills within the community. Operational challenges may include identifying the source of contamination, determining its potential impact on source water (which may include special monitoring), and taking remedial action as required (such as well shutdown).

6.9 Process Flow Diagram

A process flow diagram depicting the Pickle Lake Drinking Water System is provided on the following page.

7 Risk Assessment

Refer to DWQMS Procedure QP-02 (Risk Assessment & Risk Assessment Outcomes).

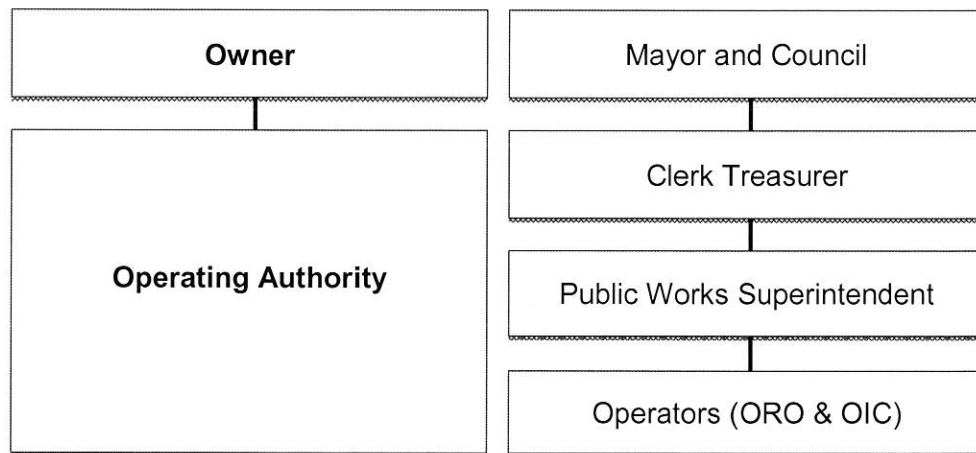
8 Risk Assessment Outcomes

Refer to DWQMS Procedure QP-02 (Risk Assessment & Risk Assessment Outcomes).

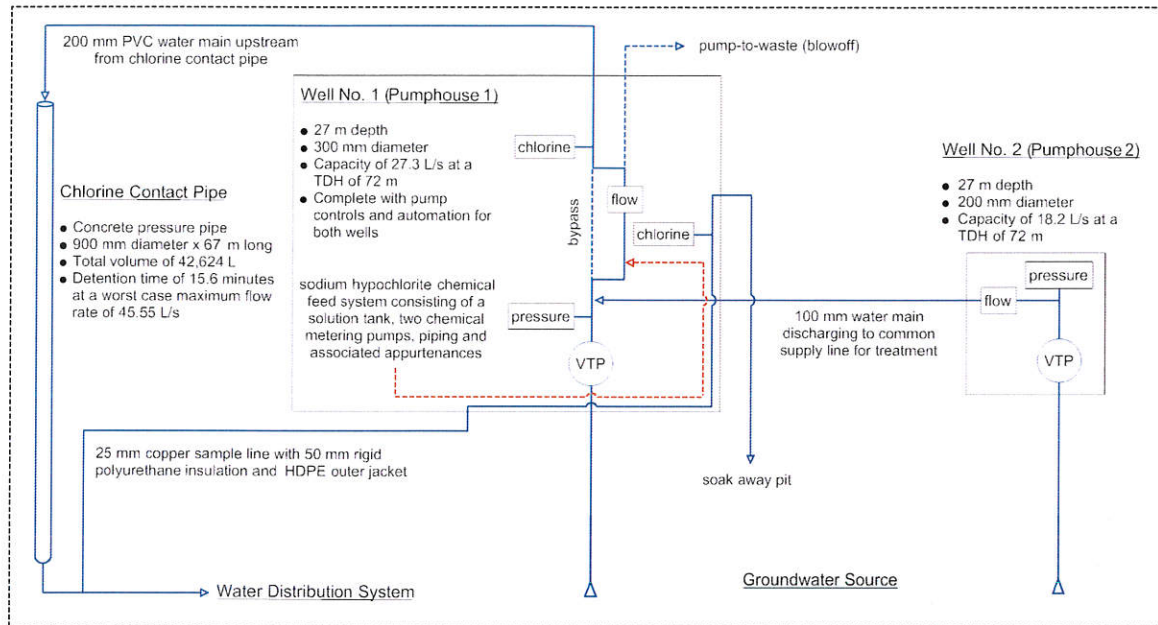
9 Organizational Structure, Roles, Responsibilities and Authorities

9.1 Organizational Structure

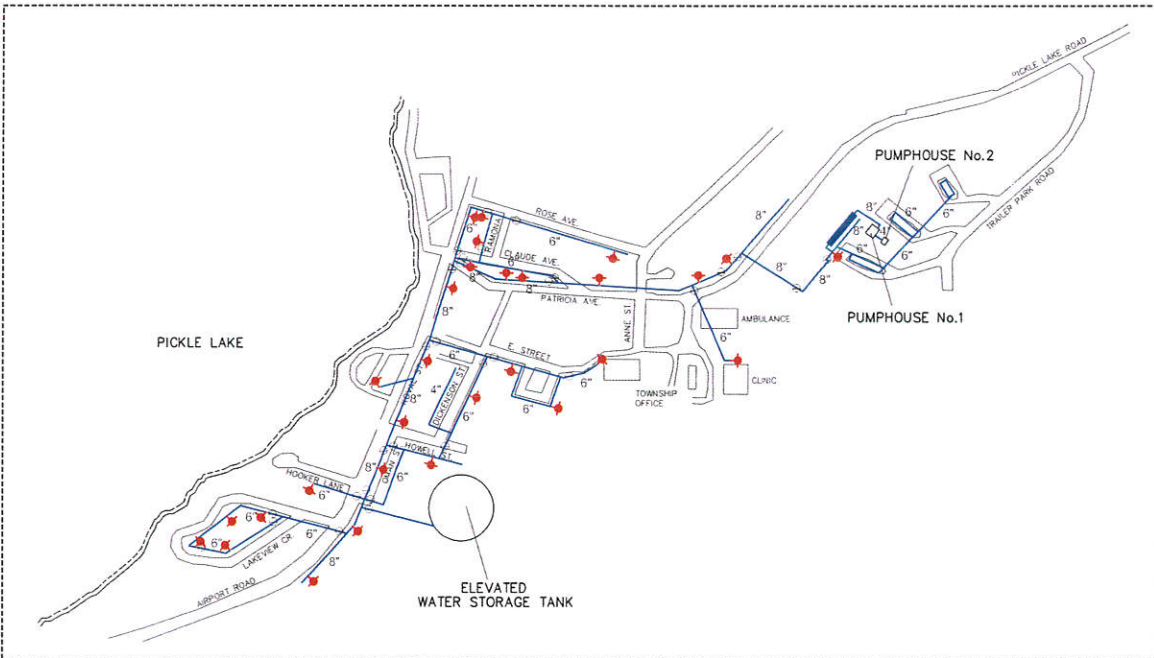
The Corporation of the Township of Pickle Lake owns, operates and maintains the Pickle Lake Drinking Water System. The Township of Pickle Lake has defined two levels of management within its structure (Owner and Operating Authority), and these two levels ultimately share responsibility for the maintenance and continual improvement of the QMS. An organizational chart outlining the two levels of management is provided below.



Water Supply (Treatment) Components



Water Distribution Components



<p>NORTHERN WATERWORKS INC.</p>	PROJECT NAME:	PICKLE LAKE DRINKING WATER SYSTEM
	DRAWING DESCRIPTION:	PROCESS FLOW DIAGRAM
REVISION HISTORY		
NO.:	DATE:	BY: DESCRIPTION:
1	February 2016	N.K. Issued for Municipal Drinking Water Licence renewal

LEGEND	
	WATER LINES
	BYPASS/WASTE
	CHEMICAL FEED LINE
	INSTRUMENTATION
	VERTICAL TURBINE PUMP
	WATER MAIN VALVE
	HYDRANT AND HYDRANT VALVE

Mayor and Council provide oversight at the corporate level, while direct operational activities are delivered by the Operations Manager or Designate and other certified Operators. The Clerk Treasurer plays a critical role within the QMS as a key link between Operations personnel and Council.

9.2 Roles, Responsibilities and Authorities

The Township's management defines the roles, responsibilities and authorities under its QMS for all employees whose work could have an impact on drinking water quality and supply. These are communicated to all personnel to ensure that individual roles and responsibilities are understood. The Clerk Treasurer and the Public Works Superintendent assume Top Management responsibilities with respect to the Drinking Water Quality Management Standard.

Specific QMS-related roles, responsibilities and authorities of operations personnel are summarized below. Additional responsibilities and authorities of employees are described in their corresponding job descriptions. Responsibilities and authorities with respect to individual elements of the QMS are outlined in the DWQMS Procedures referenced throughout this Plan.

Clerk Treasurer:

1. Ensure appropriate resources to maintain and continually improve the QMS;
2. Review major issues/deficiencies and discuss options with the Superintendent to address/resolve;
3. Participate in/respond to Management and Infrastructure Reviews, as appropriate; and,
4. Liaise with Council on relevant components of the QMS including roles, responsibilities and authorities, as appropriate.

Superintendent:

1. Delegate responsibilities, deploy resources, and supervise the operation and maintenance of the system;
2. Ensure competent certified operational personnel are available to operate the system and they are aware of all applicable legislation and regulatory requirements in relation to their operational duties;
3. Ensure that operational personnel receive the appropriate level of training on an annual basis to ensure their competency within their designated positions;
4. Establish a training plan for personnel to address regulatory and QMS requirements;
5. Develop action plans to respond to the findings of the internal audits, MOE inspections and verify action plan completion;
6. Establish, test and update Standard Operating Procedures and contingency plans;
7. Report to the Clerk -Treasurer on the performance and effectiveness of the QMS;
8. Report on QMS performance and identify opportunities for improvement to Township Council;

9. Liaise with stakeholders on relevant components of the QMS including the Township roles, responsibilities and authorities for the system;
10. Ensure the system achieves compliances with all applicable legislation and regulations; and,
11. Exercise administrative and communication functions with all departments within the Ministry of Environment, local District Office and the Safe Drinking Water Branch.

Water-Wastewater Operator ORO (Overall Responsible Operator):

1. Work in accordance with Township policies, guidelines, procedures and plans, including documenting all activities, considering the risks and ramifications of all actions, being aware of all environmental and public health risks, and performing duties in compliance with applicable legislation and regulations;
2. Fulfill defined duties of the QMS Representative within the scope of policies, procedures and plans;
3. Participate in the development and testing of SOPs and Contingency Plans;
4. Document all activities;
5. Participate in QMS training and processes and take all other appropriate training to ensure competence in their job;
6. Assisting with correcting deficiencies identified in audits/inspections; and,
7. Identify and report to the Superintendent opportunities for improving the facility's QMS.

Water-Wastewater Operator OIC (Operator in Charge):

1. Work in accordance with Township policies, guidelines, procedures and plans, including documenting all activities, considering the risks and ramifications of all actions, being aware of all environmental and public health risks, and performing duties in compliance with applicable legislation and regulations;
2. Fulfill defined duties within the scope of policies, procedures and plans;
3. Participate in the development and testing of SOPs and Contingency Plans;
4. Document all activities;
5. Participate in QMS training and processes and take all other appropriate training to ensure competence in their job;
6. Assisting with correcting deficiencies identified in audits/inspections; and,
7. Identify and report to the Superintendent opportunities for improving the facility's QMS.

10 Competencies

10.1 Required Competencies

The competencies required by Township of Pickle Lake personnel whose duties directly affect drinking water quality or supply are as follows:

Superintendent:

1. Knowledge of water treatment and distribution operations and maintenance;
2. Management and/or supervisory experience;
3. Financial management experience; and,
4. WHMIS training.

Overall Responsible Operator (ORO):

1. Knowledge of water treatment and distribution operations and maintenance;
2. Operator certification in good standing;
3. SCADA experience;
4. Confined space training; and,
5. WHMIS training.
6. Knowledge of the DWQMS system with the ability to ensure it is Maintained.

Operator in Charge (OIC):

1. Knowledge of water treatment and distribution operations and maintenance;
2. Operator certification in good standing;
3. SCADA experience;
4. Confined space training; and,
5. WHMIS training.

10.2 Developing and Maintaining Competencies

Recruitment practices utilized by the Corporation of the Township of Pickle Lake determine personnel competencies upon employment. The Superintendent selects and assigns personnel based on their qualifications, training, and experience for the required duties.

Operators receive site-specific training on relevant operational and emergency response procedures to ensure the effective operational control of processes and equipment which may impact the safety and quality of drinking water. Orientation training for new employees also includes information related to QMS awareness.

Certified operators are responsible for a) completing the annual number of required training hours for the class of the subsystem where the operator works

and b) completing the mandatory renewal course as required. The Superintendent takes reasonable steps to ensure that every operator has the opportunity to attend training to meet the annual training requirements.

The Township provides support for personnel to obtain both continuing education units and on-the-job practical training through a combination of methods (i.e. classroom/online courses, hands-on training, etc.).

10.3 Records

Individual employee training records are maintained by the Township of Pickle Lake in accordance with DWQMS Procedure QP-01.

11 Personnel Coverage

Refer to DWQMS Procedure QP-03 (Personnel Coverage).

12 Communications

Refer to DWQMS Procedure QP-04 (QMS Communications).

13 Essential Supplies and Services

Refer to DWQMS Procedure QP-05 (Essential Supplies and Services).

14 Review and Provision of Infrastructure

Refer to DWQMS Procedure QP-06 (Review and Provision of Infrastructure).

15 Infrastructure Maintenance, Rehabilitation, & Renewal

15.1 Planned Maintenance

The Township of Pickle Lake maintains a program of scheduled inspections and maintenance of infrastructure for which it is operationally responsible. Such routine planned maintenance activities include:

- a) Pump inspection (well pumps and water tower recirculation pump);
- b) Instrumentation (analyzers, flow meters, lab instruments) calibration and maintenance;
- c) Water tower and watermain inspection;
- d) Valve inspections and maintenance;
- e) Fire hydrant inspection and maintenance.

Planned maintenance activities are scheduled using a manual maintenance management system that allows the user to view detailed asset information, view printed process work orders, access maintenance, inspection procedures, records and asset histories, and plan, schedule and document all asset related tasks and activities.

Planned maintenance activities are scheduled using the maintenance management system and are communicated to personnel responsible for completing the task by the Superintendent. The Superintendent ensures that equipment and parts are available for planned and unplanned maintenance. Maintenance plans are developed according to historical experience, manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment operation and maintenance manuals are accessible to staff at the locations specified in DWQMS Procedure QP-01.

15.2 Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Superintendent. Unplanned maintenance activities are recorded in corrective maintenance work orders. The work orders are entered into the maintenance management system and a notation is placed in the facility logbook.

15.3 Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades are determined on an annual basis (refer to DWQMS Procedure QP-06). A list of required replacement or desired new equipment is compiled and prioritized by the Superintendent and is presented to the Clerk Treasurer for review and comment. All major expenditures require the approval of Council.

16 Sampling, Testing, & Monitoring

Refer to DWQMS Procedure QP-07 (Sampling, Testing and Monitoring).

17 Measurement and Recording Equipment Calibration and Maintenance

Refer to DWQMS Procedure QP-08 (Measurement and Recording Equipment Calibration and Maintenance).

18 Emergency Management

Refer to DWQMS Procedure QP-09 (Emergency Management).

19 Internal Audits

Refer to DWQMS Procedure QP-10 (Internal DWQMS Audits).

20 Management Review

Refer to DWQMS Procedure QP-11 (Management Review).

21 Continual Improvement

The Township of Pickle Lake is committed to continually improving the effectiveness of its Quality Management System. Continual improvement is facilitated by the management review and internal auditing processes, which include the identification of QMS deficiencies and the assignment of action items.

22 Revision History

Date	Revision	Description of Revision
15-Apr-2013	0	Operational Plan issued
15-Aug-2013	1	Operational Plan revision – external audit findings
15-Jul-2014	2	Operational Plan revision – internal audit findings
15-Jul-2015	3	Operational Plan revision – internal audit findings
03-Jun-2016	4	Operational Plan revision – QMS restructuring
26-Oct-2016	5	Operational Plan revision – external audit findings
06-Mar-17	6	Operational Plan revision – Took out training program.

Schedule "C"

Director's Directions for Operational Plans – July 2007

Subject System Description Form			
Municipal Residential Drinking-Water System			
Owner of Municipal Residential Drinking-Water System:	The Corporation of the Township of Pickle Lake		
Name of Municipal Residential Drinking-Water System:	Pickle Lake Drinking Water System		
Subject Systems			
	Name of Operational Subsystems (if applicable)	Name of Operating Authority	DWS Number(s)
<input checked="" type="checkbox"/>	Check here if the Municipal Residential Drinking-Water System is operated by one operating authority. Enter the name of the operating authority in adjacent column	The Corporation of the Township of Pickle Lake	210001157
Add attachments if there are additional 'Operational Subsystems'			
Contact Information			
Name	Title	Phone No(s).	Email Address
Erkki Pohjolainen (Primary)	Clerk Treasurer	Office: 807-928-2034	clerktreasurer@picklelake.org
Kyle Clemmer (Alternate)	Operator	Office: 807-928-2034	watersewer@picklelake.org