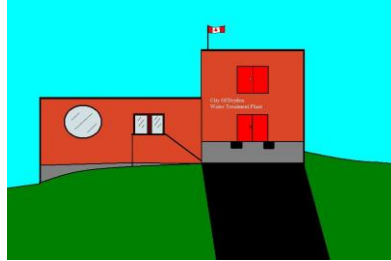


# The Town of Rainy River

## *Drinking Water Quality Management System*

### Operational Plan



### Rainy River Drinking Water Supply System

317 River Avenue  
Rainy River, ON  
POW 1L0

This Operational Plan for the Town of Rainy River Water Supply System will become effective on the 1<sup>st</sup> day of June, 2010.

#### Table of Revisions

Date	Description of Revision
December 2010	Implemented recommendation from MOE
March 2011	Minor typographical changes/# of fire hydrants changed
July 2011	Compliance Audit – Corrective Actions Addressed
September 2011	Compliance Audit – August – Corrective Actions Addressed
January 23, 2013	SAI Compliance Audit – Corrective Actions Addressed
February 25, 2013	SAI Compliance Audit – Additional Corrective Actions Addressed
November 26, 2013	Operator Information, Appendix K Addition
January 15, 2015	Internal Audit
April 2, 2015	Internal Audit Finalize
December 2015	External Audit & Staff Review
November 2016	Internal Audit Finalized – Corrective Actions Addressed
October 2017	Internal Audit Finalized – Corrective Actions Addressed
August 2018	Internal Audit – Corrective Actions Addressed
November 2018	External Audit – On Site

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## **1. Quality Management System**

The Town of Rainy River Drinking Water Quality Management System (DWQMS) is documented in this Operational Plan as part of our efforts to ensure that clean, safe and reliable drinking water is supplied to all customers served by the Town of Rainy River Water System. The development and continual improvement of the plan will ensure that all applicable legislation and all current regulatory requirements are met and that consumers can be confident that their drinking water will be protected through the effective application of the QMS.

## **2. Quality Management System Policy**

The Town of Rainy River is committed to managing the treatment and supply of clean, safe drinking water to all of its customers and commits to consistently meeting all applicable legislation and all current regulatory requirements and customer needs. To achieve these goals the Town of Rainy River commits to:

- Managing water quality from source to customer.
- Regular monitoring and testing of water to meet or exceed current guidelines as established in the Safe Drinking Water Act.
- Providing consistent and relevant training to operators to meet or exceed current training guidelines.
- Investing capital monies to provide upgrades and rehabilitations to treatment and distribution systems.
- Continuing to establish and upgrade current practices and policies.
- Providing Water Treatment Plant Annual Reports as per Ministry of the Environment forms to be available to all customers in hard copy or on the town's web site. These reports provide the customer with an annual overview of the Town water supply system.

The Town of Rainy River will establish and maintain a Drinking Water Quality Management System that will be regularly reviewed, improved and upgraded by management and employees involved in the supply of drinking water. The highlights of this Operational Plan for this Quality Management system will be readily available in hard copy at the WTP/Town Office or it can be accessed on the Town of Rainy River website ([www.rainyriver.ca](http://www.rainyriver.ca)).

The Drinking Water Quality Management System will be implemented by the Town to effectively minimize and manage any potential risks to drinking water quality and safety.

### **3. Commitments and Endorsement**

This Operational Plan has been reviewed and approved by the Town of Rainy River Chief Administrative Officer. This is a blueprint for the planning, operation, and maintenance of the Municipal Water System. An annual review by the Chief Administrative Officer and Public Works Foreman/Overall Responsible Operator will keep the document up to date and promote continual improvement.

Endorsed by:

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Mayor

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Chief Administrative Officer

## 4. Designated QMS Representative

The Town of Rainy River has designated two individual as QMS representatives.

Position: Chief Administrative Officer

Position: Public Works Foreman 1 Overall Responsible Operator (ORO)

## 5. Documents and Records Control

In accordance with the requirements of the DWQMS procedures are in place for Document and Record Control. These procedures describe how documents and records are controlled and are attached as Appendix A at the end of this document.

## 6. Drinking Water System

The Rainy River Water System is owned and operated by The Corporation of The Town of Rainy River and serves the residents of Rainy River and a small number of residents from the adjoining municipality. The Town of Rainy River is located in Northwestern Ontario, Highway 11, on the border of Minnesota and Ontario.

### *Source Water*

The raw water source for the Town of Rainy River is obtained from the Rainy River which is part of the Winnipeg River (Arctic) watershed. Rainy River is a boundary-water bordered by Ontario and Minnesota.

The Rainy River which starts at Rainy Lake and ends at the Lake of the Woods is approximately 120 km's in length. The depth of the river ranges from 1.5 meters to 12 meters with an average depth of approximately 6 meters. Raw water quality can be characterized as having high levels of turbidity 1.3 to 187 NTU's. Bacteriological results range from 0 cfu to 200 cfu.

### **Raw Water Characteristics**

	Temperature	pH	Turbidity	Colour	E. coli Total Coliforms
Average	10.77	7.26	7.98	56.89	

Range	1.8-25.9	6.10-8.90	1.46-229	4.4-129	
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These results were taken over a 10-year period from 2005 to 2015.

***Events***

During spring break-up of the Rainy River along with the run-off, turbidity levels rise very high. This can be corrected with making the appropriate physical or chemical adjustments to the treatment process.

***Threats***

Up stream of the intake, is a lumber mill, paper mill, residential (Fort Frances and the Township of Emo), agricultural activities and wildlife.

Potential sources of raw water contaminates include spills from the highway or rail mishaps, spills from the mills, high rainfall causing run-off or agricultural land, and sewage spills from the US side of the river.

As there is only a single intake line, there is a risk of a collapsed or plugged intake line.

***Operational Challenges***

The Rainy River provides a good supply of source water. The most significant challenge related to source water is the quick change in turbidity due to rain, high winds and run-off.

***Treatment System***

Raw water is supplied to the treatment plant through a 250 mm diameter intake pipe. The pipe extends 112 m south of the plant and terminates in an up-turned elbow equipped with a steel screen and mounted in a rock crib. At normal water levels, the intake is situated approximately 20 feet below the surface.

The Rainy River Water Treatment Plant is a surface facility designed to meet minimum treatment requirements using full conventional treatment (i.e., chemically assisted filtration and disinfection). Raw water is directed to a wet well through a gravity-fed intake line from the Rainy River. Alum is added to the raw water well. Partially treated water is pumped to the flash mixer via two low lift pumps each with a rated capacity of 28.6L/s. Only one pump is operated at any given time. The raw

water intake line is equipped with a flow control device to ensure that raw water flow does not exceed 28.6 L/s; the rated capacity of the plant. Partially treated water then enters a vacuum chamber and is pulsed to a settling chamber. Water flows upward through a sludge bed and settling tubes where it is collected and discharged to the filters. The clarified water is distributed over two anthracite and sand filters. Filtered water flows to the equalization tank and then pumped to the Ion Exchange units prior to entering the reservoir. Filter effluent is pH adjusted with soda ash. Each of the two filters effluent lines are equipped with a meter to continuously monitor turbidity. The meters are equipped with alarms and set to an automatic dialer. Disinfection is achieved using chlorine gas injections; contact time is provided by a two-celled, baffled clear well. A chlorine analyzer provides continuous monitoring of free chlorine in treated water leaving the plant. An alarm is set to an automatic dialer if chlorine levels are higher or lower than set limits.

### ***Process Waste Management***

Filter backwash and sludge from the clarifier flows to a holding tank which is then pumped to the Town's sewer system, which ends up in the Town's sewage lagoon.

### ***Distribution System***

The distribution system for the Town of Rainy River serves a population of 925 and is pressurized by three 20 hp high lift vertical turbine pumps with a rated capacity of 19 L/s at 51.2 m TDH and a fire pump with a rated capacity of 75.7 L/s at 53.3 TDH. Under normal demand only one pump is required to provide adequate pressure to the system which is 40 to 62 psi. If pressure should drop below 40 psi the second pump will cut in and a third if demand is not met. If demand is still not met the fire pump will cut in to raise pressure back to 62 psi.

Water is stored at the plant in an 1136m<sup>3</sup> two cell reservoir which is about 48 hours of storage. There are no additional water storage facilities in the Town of Rainy River.

The distribution network consists of approximately 16 km's of piping fed from the Water Treatment Plant and consists of cast iron, ductile iron and PVC, the sizes range 50 mm to 300 mm. Within the system there are 75 valves and 62 fire hydrants.

### ***Barriers to Microbiological Pathogens***

The following processes remove potentially pathogenic organisms:

1. Coagulation / Flocculation / Sedimentation
2. Filtration
3. Chlorination (primary disinfection)
4. Distribution system chlorine residual (secondary disinfection)

*Analyses*

Ontario Regulation 170/03 and the current Municipal Drinking Water License and Works Permit issued by the Ministry of Environment (MOE) dictate the sampling and monitoring requirements for this system. Water quality is tested throughout the treatment process and from dedicated locations throughout the distribution system.





## 7. Assessment (covered under Section 8)

### 8. Risk Assessment Outcomes

The Town of Rainy River has established, implemented and maintains this procedure to determine what potential hazards and critical control points exist in the Water Treatment and Distribution System.

The Risk Assessment Team consists of the Chief Administrative Officer, the Public Works Foreman (ORO) and could also include operations staff as required.

The Risk Assessment procedure is conducted once every 36 months or more frequently if a significant process change or upgrade has occurred. The process for hazard analysis includes an assessment of each process step and/or activity and identification of hazards that are potentially present or possible at each process step and/or activity.

At least once every calendar year, the currency of the information and the validity of the assumptions used in the risk assessment will be reviewed. All notes, meeting minutes, action items and decisions shall be documented and kept as part of the file for the process.

Once hazards are identified, the next step is the determination of critical control points (CCPs). This process involved a risk assessment by prioritizing hazards and identifying points where control may be exerted to eliminate or minimize those hazards, (for example, by determining which are CCPs).

The risk assessment was performed by rating the likelihood, severity and detectability of each hazard at each relevant process step or activity on a scale of 1 to 5. The values for each of these factors were added together to give a risk priority number. The high risk CCP threshold equals 8.

**Likelihood** is probability/likelihood of a hazard or hazardous event occurring.

**Severity or Consequence** is the potential impact to health or impact on operations if the risk is not controlled (assumes control measures do not work).

**Detectability** is a measure of the ability to detect the presence of certain hazards. Hazards, which could be easily and quickly detected, were given a low value. Hazards that are hard to detect or undetectable are given a high value. The risk is greater as appropriate responses cannot be taken to control or mitigate the risk.

**The rating system is defined on the following page:**

<b>Description</b>	<b>Likelihood of Hazard Occurring</b>	<b>Rating</b>
Rare	May occur in exceptional circumstances, or has not occurred	1
Unlikely	Could occur at some time, historically has occurred annually or less than annually.	2
Possible	Has occurred once or more per year.	3
Likely	Has occurred on a monthly to quarterly basis.	4
Very Likely	One or more occurrences on a monthly or more frequent basis	5

<b>Description</b>	<b>Severity of Hazard Occurring</b>	<b>Rating</b>
Insignificant	Insignificant impact, little disruption to normal operation.	1
Minor	Minor impact for small population, some manageable operation disruption, some increase in operational requirements.	2
Moderate	Minor impact for small population, significant modification to normal operation but manageable. Increased monitoring and operational requirements.	3
Major	Major impact for small population, systems significantly compromised and abnormal operation if at all.	4
Catastrophic	Major impact for large population, complete failure of all systems.	5

<b>Description</b>	<b>Detectability of Hazard</b>	<b>Rating</b>
Very Detectable	Very easy to detect, instantaneous, computer monitored	1
Moderately Detectable	Moderately detectable, alarm present but not in computer, may require operator to walk by and notice alarm; problem is indicated promptly by lab test results.	2
Normally	No alarm present, visually detectable on rounds or regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; would not be detected before a problem was evident; lab tests that are not done on a regular basis.	4
Undetectable	Undetectable, cannot detect.	5

Included in the following pages is a chart that identifies the process and activity hazards related to the Water Treatment & Distribution System along with the outcome of the risk assessment, and finally the identification of which of these are identified as critical control points.

Critical control points identified in the table that follows have controlled conditions that are established, implemented and maintained that include:

- a) Critical limits
- b) The availability of information to operations personnel that outlines the critical limits
- c) The availability and awareness of Standard Operating procedures (SOPs), which include recovery procedures, as necessary, and
- d) The reliability and redundancy of equipment, as appropriate to the identified risks and nature of the Water Treatment Plant.

All deviations from the critical control limits are reported as per instructions contained within the Operations Manual for Emergencies or the Standard Operating Procedures manual for the Town of Rainy River water system.

Element or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plan	Likelihood	Severity	Detectability	Risk Priority Number CCP Threshold =8	CCP?	Control Procedure
Source Water	Rail Car Derailment or Highway Accident - spill of chemical or contaminant	Chemical contamination of source water		Notification to MOE Spill Action Centre of spill and potential for contamination of source water	Stop producing water until plume passes supply from, storage, implement water restrictions if necessary.	1	3	2	6	No	
	Discharge of inadequately treated septic system effluent as a result of flooding, high rainfall, etc.	Biological contamination of source water	An upstream process to be captured under Source Water Protection.	Conventional Water Treatment Operations. Weekly Bacteriological Testing of Raw Water Source.	Discuss with Ministry of Health re: source of e. coli	1	2	2	5	No	
	Pesticides in runoff water as a result of flooding, high rainfall, etc.	Chemical contamination of source water	An upstream process to be captured under Source Water Protection	Interim Measure: Annual correspondence letter re: risks associated with pesticide application and runoff.	Future action:	1	1	2	4	No	
	Collapse or breakage of single intake pipe	Quantity / Quality		Pump shut down on low level in pump well; Loss of raw water flow signal	WTP Operation Manual (OM) Emergency Procedure	1	4	1	6	No	OM Emergency Procedures, Raw Intake Line Failure

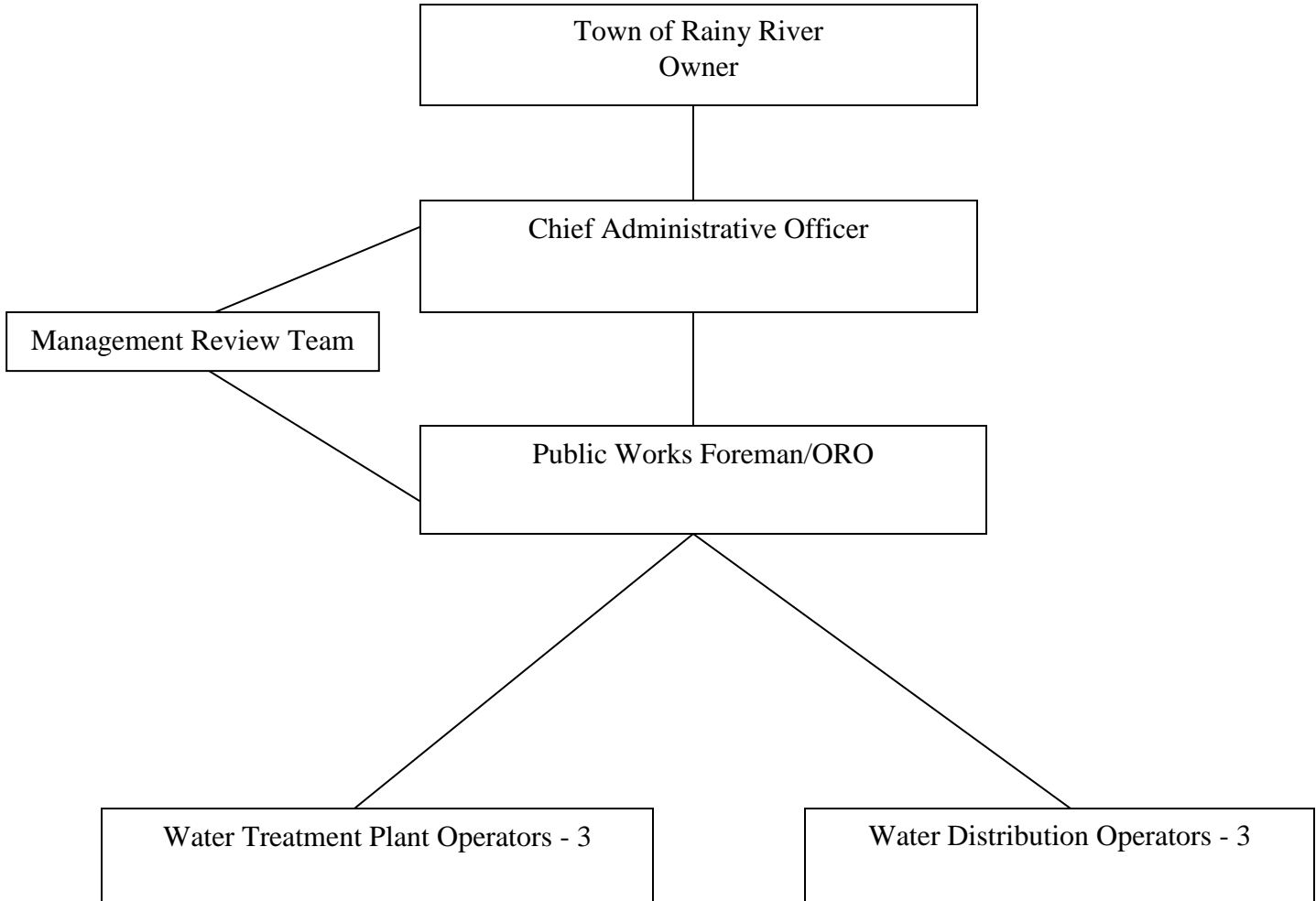
Element or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plan	Likelihood	Severity	Detectability	Risk Priority Number CCP Threshold =8	CCP?	Control Procedure
Treatment	Loss of coagulant - plugging of lines, pump failure, clogging of screens	Biological & Chemical contamination	Crypto/Giardia not removed without coagulant.	On-line flow monitor : Critical Control Limit; Filter Effluent Turbidity 0.3 NTU. Plant shut down.	Operations Manual (OM)	3	2	1	6	Yes	Operating Problems & Solutions, Alum Feed.
	Loss of polymer-plugging of lines, pump failure, clogging of screens	Shorter filter runs		High level alarm at filter; Visual inspections throughout the day	Repair polymer feed system.	3	1	2	6	No	
	Flash mixer failure	Shorter filter runs		High level alarm at filter; Visual inspections throughout the day	Repair flash mixer drive system. (Impeller drive). Change to backup.	2	1	2	5	No	Change to Backup mixer.
	Filter breakthrough, filter under drain failure	Biological contamination	Crypto/ Giardia not removed without coagulant.	On-line filter effluent turbidity meters; Critical Control Limit- .3 NTU. Plant shut down.	Shut down filter: take it out of service	1	4	1	6	Yes	OM Operating Problems and Solutions.
	Backwash pump failure (only 1 pump)	Quantity / Quality		Water high in filters.	Spare motor & spare parts for pump at WTP.	1	2	1	4	No	
	Filter to waste valve failure	Biological contamination		Shut down of filters on high turbidity, alarms	Shut down filter; take it out of service	2	2	2	6	No	
Primary Disinfection	Chlorinator failure	Biological contamination	Bacteria and viruses not inactivated without chlorine	Online chlorine analyzer alarm- Critical Control Limit;0.50 mg/l Alarm set at 1.0	Switchover to standby chlorinator & spare parts to make repairs.	1	5	2	8	Yes	OM: "Operating Problems and Solutions" "Low Chlorine Residual" "Switch Chlorinators"
Treated Water Reservoir	Loss of structural integrity of reservoir - leakage into reservoir	Biological contamination Chemical		Online turbidity meter & CL2 analyzer, weekly bacteriological testing.	Shut down reservoir. Switch to single reservoir, increase dosage and issue water restriction notice to community.	1	3	2	6	No	OM: "Emergency Procedures" Taking Reservoir Out of Service.

Element or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plan	Likelihood	Severity	Detectability	Risk Priority Number CCP Threshold =8	CCP?	Control Procedure
Distribution	Breakage of single pipe from plant to distribution system	Quantity / Quality	No distribution system storage; need to pump continuously from the plant.	Community complaints; Low pressure alarm or high flow indicators at the plant.	Repair	1	5	1	7	No	See: Emergency Procedure for Water main breaks at WTP.
	Loss of chlorine residual (secondary disinfection)	Biological contamination	Legislated under O. Reg. 170/03.	Daily residual testing at far end of system, weekly monitoring at locations in town.	Flush the system; increase chlorine dosage and re-sample.	2	3	2	7	No	See O. Reg. 170/03 Requirements for corrective actions.
	Loss of pressure - water main break	Biological and chemical contamination		Customer complaints, low/high pressure alarms at plant.	Follow; Procedure for Water main break repair.	4	2	3	9	Yes	See: "Emergency Procedure for Water main Breaks" at WTP.
	Cross connection Policy	Biological and chemical contamination	Backflow preventers.	Visual	Isolate area; Flush the system and resample; pressurize system.	1	3	4	8	Yes	By-law in place. Report Adverse MOH, MOE, SAC
	High lift pump failure	Quantity /Quality		Low pressure	Back-up pumps	3	1	1	5	No	



## 9. Organizational Structure, Roles, Responsibilities, and Authorities

- Organization Chart -



***Town of Rainy River, Mayor and Municipal Council. (Owner)***

The Town of Rainy River, which is represented by an elected Mayor and municipal Council, is responsible for ensuring the delivery of a safe and reliable supply of drinking water to the residents of the Town of Rainy River.

The owner has the authority to delegate the management of the drinking water system to qualified staff.

***Chief Administrative Officer (top management)***

The Chief Administrative Officer is responsible for arranging reporting to the Mayor and Council on the oversight of the municipal water system. The manager will receive (information) reports from the Foreman regarding issues that are relevant to the overall operation of the water system. The Chief Administrative Officer is authorized by council to ensure that management staff is in place to ensure the municipal water system is supplying safe and reliable drinking water. The Chief Administrative Officer duties include the responsibilities of the QMS Representative to maintain the currency of operational documentation and that documentation is being reviewed and updated annually or upon receipt of updated information.

***Public Works Foreman (Designated DWQMS Representative/Chief Plant Operator/ORO/Water Distribution System Lead Hand)***

The Public Works Foreman/ORO is responsible to ensure that operations within the municipal water supply system are being performed to ensure that municipal drinking water is safe and systems are in compliance with current regulations. The Public Works Foreman/ORO must provide long term planning and budgeting, informs the Chief Administrative Officer and Council of deficiencies and required resources and provide the Chief Administrative Officer and Council with current technical and administrative information and advice.

The Public Works Foreman/ORO has the authority to ensure staff is in place to manage the water supply system, evaluate and prioritize long term utility needs. The Public Works Foreman/ORO is responsible for the management of the daily operations of the water treatment plant and distribution system. The Public Works Foreman/ORO will provide guidance and receive feedback from operators on regular operations and future needs. Responsibilities also include preparing reports for capital expenditures, budgeting, maintenance activities, and infrastructure condition assessments for the Chief Administrative Officer, Council, regulatory authorities and public.

The Overall Responsible Operator is the QMS Representative and is therefore responsible for ensuring that the current version of the documents, as required by the QMS, are being used and to ensure that processes and procedures for the QMS are maintained.

The Public Works Foreman/ORO is authorized to direct operators, develop policies, and communicate with regulatory and technical authorities including the Chief Administrative Officer, Council and the general public.

The Public Works Foreman is the designated Overall Responsible Operator (ORO), and is responsible for the supervision of daily operations and staff at the Water Treatment Plant. The Public Works Foreman/ORO ensures that all operations are in compliance with current regulations. Responsibilities include oversight of process operation and controls, scheduling maintenance, scheduling staff, ensure that employee's certifications and minimum training requirements are up to date, confirming all required tests are completed, reporting normal and abnormal conditions to Chief Administrative Officer. The Public Works Foreman/ORO also ensures that standard operational procedures are followed as documented in the current Operations Manual. The Public Works Foreman/ORO must maintain a minimum Class 2 Water Treatment Certification to fulfill the required responsibilities.

The Public Works Foreman/ORO is authorized to make any process adjustments to ensure the supply of safe and adequate drinking water. Authorization includes purchasing of process chemicals, lab supplies, testing services, and equipment parts. The Public Works Foreman/ORO is also authorized to direct the duties of the plant operators and supervise any on site contractors.

The Public Works Foreman is the designated Overall Responsible Operator (ORO), and is responsible for the daily operation and maintenance of the water distribution system. This includes ensuring a safe and adequate supply of water for all customers. The Public Works Foreman/ORO directs operators and contractors in the repair and maintenance of all aspects of the distribution system, which includes hydrants, main valves, services and shut offs. Recording of daily activities, following current regulations and reporting of normal and abnormal conditions to the Manager are included in the duties. The Public Works Foreman must maintain a Level 1 Water Distribution Certificate.

The Public Works Foreman/ORO has authorization to take control of emergency situations (ex. water main break) and use whatever equipment is necessary to complete repairs in a safe and efficient manner.

### ***Operator in Charge (OIC)***

Must have a minimum Class I Water Treatment Certificate. Identified on daily log sheet as OIC. Makes data entries in logbooks and on log sheets. Performs all on site water tests and makes and records all process adjustments.

### ***Operator***

All operators are responsible for maintaining required Ministry of the Environment Certification for Water Treatment and Water Distribution Systems. Operators are required to carry out the daily duties for the treatment and distribution processes to ensure operations are completed in compliance and if a non-compliance incident occurs it must be acted upon and reported. Operators are authorized to collect samples, perform testing, adjust treatment processes with direction from the Chief Operator and perform maintenance on the treatment and distribution system in accordance with standard operating procedures to ensure a safe and adequate water supply.

## **10. Competencies**

The following identifies the competencies required of Town of Rainy River staff whose performance may have a direct impact on drinking water quality.

### ***Chief Administrative Officer (DWQMS Representative)***

Shall possess advanced theoretical and working knowledge of administrative skills expected of a senior level manager. In addition an intermediate theoretical and working knowledge of the Safe Drinking Water Act applicable regulation, and the Town of Rainy River drinking water supply system.

### ***Public Works Foreman/ORO***

Shall possess advanced theoretical and working knowledge of administrative skills expected of a senior level manager. In addition an intermediate theoretical and working knowledge of the Safe Drinking Water Act, applicable regulations, and the Town of Rainy River Drinking Water Supply System.

Shall possess a minimum Class II Water Treatment Certificate and a minimum Class I Distribution certificate.

### ***Facility Classification***

As of November 30, 2005 the Ministry of the Environment reclassified the Town of Rainy River Water Supply System to a Class II Treatment and Class I Distribution system.

### ***Operator Competencies***

Ontario Regulation 128/04 requires that all Water Treatment and Distribution Operators possess operating licenses appropriate to the class of facility where they are employed.

The Overall Responsible Operator (ORO) shall have a minimum Class II Water Treatment Certificate or Class I Water Distribution Certification as applicable.

Operators acting in relief of the ORO shall have a minimum Class I Water Treatment Certificate and Class I Water Distribution Certification. Class I may be Acting ORO for 150 days.

All operators shall be licensed to minimum OIT while ultimately working toward obtaining a Class II Treatment or Class I Distribution Certification.

***Operators are required to have skills and knowledge in the following areas:***

#### ***Treatment Plant Operator***

- Understand the concepts and reasons for water treatment, disinfection, water borne diseases, pathogens and other bacteria related to water
- Basic knowledge of math, science and chemistry used in the treatment process
- Knowledge of water regulations and adverse water conditions
- Importance of following policies and procedures, and potential consequences for not following them
- Perform lab analyses and interpret results
- Ability to handle emergency situations
- Adjust and check chemical feed rates
- Safely handle chlorine and chlorinator maintenance and repair
- Filter maintenance and backwashing
- Pump maintenance and repair
- Knowledge of the chemicals used in the process and safe handling practices

### ***Distribution System Operator***

- Familiar with Town distribution system
- Repair leaks safely and follow regulations on disinfection of repaired water mains
- Valve maintenance and repair
- Hydrant maintenance and repair

### ***Satisfying Competencies***

The following satisfies Competency requirements for Town of Rainy River staff.

- Top management is briefed on operating conditions and provided regulatory updates during annual review meeting.
- Management regularly attends relevant Drinking water training courses, conferences, and seminars.

### ***Operator Training & Certification***

#### ➤ **New Operators (OIT's)**

After successful completion of the OIT Water Treatment and Water Distribution Prep Course (60 hrs) and OIT exam, a new operator will train with an experienced operator until a satisfactory level of competence has been reached. The Public Works Foreman/ORO will determine this through observation and peer review. The entry level course, 40 hour home course and entry level exam must be complete before moving on to Class I course.

#### ➤ **Class I Water Treatment & Distribution Operators**

After the level of competence has been reached, (usually about one year), the operator must successfully complete the Class I Water Treatment and Water Distribution Prep Course and Class I exam for either treatment or distribution to become a Class I water treatment or distribution operator.

#### ➤ **Class II Water Treatment & Distribution Operators**

After working approximately one year at the Class I level, the operator can advance to a Class II treatment or distribution operator by successfully completing the Class II Water Treatment & Distribution Prep Course and Class II exam for either water treatment or distribution.

#### ➤ **Class III & IV Treatment and Distribution Operators**

Although the treatment plant and distribution system are a Class II & I, all operators are encouraged to advance to the highest level they wish to achieve. The employer recognizes that the extra training and skills are invaluable to the operation and this is recognized in compensation. As part of the licensing requirement, all operators experience extensive on-the-job training. Specific requirements are listed in O.Reg. 128/04. According to the reg. a Class II system operator requires 23 hrs. of on the job practical training and 12 hrs. of formal CEU training per year. A Class I operator requires 23 hrs. practical & 7 hrs. CEU training per year.

Other than the prep courses noted above, some of the other training courses attended by operators are:

- Gas Chlorination Workshop
- Treatability Studies and Jar Testing
- Internal Auditing
- Valve Operation and Maintenance Course
- Pump Maintenance & Repair
- Hydrant Maintenance & Repair
- Confined Space Workshop
- WHMIS

All courses and training attended by operators are documented and signed by the employee and trainer, which acknowledge successful information transfer. Training files are maintained for all Town of Rainy River operators.

### **Recruitment Planning**

The Town of Rainy River Waterworks Department also operates the wastewater treatment and collection system. Operators work at both treatment plants on a scheduled rotation. Operators require experience, training and certification in both fields. This has to be taken into consideration when planning personnel recruitment. Starting as an OIT it may take approximately 4 years to fully certify a Class II operator for both plants.

Presently we have four treatment operators on staff; this includes the ORO. This currently meets staffing requirements at the plants. The distribution system is similar in that operators require experience, training and certification in distribution and collection. Presently there are four full time operators.

## 11. Personnel Coverage

The WTP operators work daily from 08:00 till 16:30. There is one operator on duty or on call at all times.

The #1 Operator (OIC) looks after the daily process operations like raw and treated water testing, flow totals, pump logs, filter backwashing, chemical totals and makes all entries on daily log sheets and in plant diary and assists in equipment maintenance and repair.

The Chief Operator (ORO) oversees the day-to-day operation of the plant and designates OIC. The plant is equipped with alarms on turbidity meters,  $CL^2$  analyzer, reservoir levels, building temp and  $CL^2$  leak power outage. Alarms are set to an automatic dialer, which transfers via telephone lines to the operator on call. Alarms to the operator on call are not specific, they are all Water Plant alarms, and so the operator must respond immediately to the plant. Although an exact response time is not specified, a time of 5 - 15 minutes is the norm.

In the event of an emergency, all available operators report to the water plant immediately and wait for instructions.

Operators are on call daily from 16:30 - 08:00, five days a week from Monday to Friday. All operators are on a scheduled rotation. The operator on call also works the weekend and is the OIC. Weekend operators are on call 24 hours a day.

The distribution operators work Monday to Friday, 08:00 - 16:30 and are the same operators as the Water Treatment Plant. After hour emergency calls are taken by the operator on call, who assesses the problem and calls out the appropriate personnel and equipment.

As the Town of Rainy River operates within a unionized environment, an independent firm, Anishinaabeg Kakenwaydemiwatch Nepi (AKN), has been contracted to provide backup operators in the event of a labour dispute.

**SEE Appendix D**

## 12. Communications



Target Audience	Method of QMS Communication
Owner – Town of Rainy River Mayor and Council	Internal and external audit results, Management Review results and Operational Plan revisions/updates are provided in writing from the Designated QMS representative to the Town of Rainy River CAO. Hard copies of all correspondence are retained in the Town of Rainy River file registry in accordance with the records control procedures. The QMS Representative is present at the annual management review meeting to supplement the hard copies with brief verbal presentations any answer questions. Meeting minutes are archived in the Town of Rainy River filing system.
Town of Rainy River Staff	New permanent or temporary operators are provided an overview of the Operation Plan during orientation. If substantial revision/additions are required, or if audits have been conducted, a general meeting of operators will be held to inform them of the changes or audit results. Details of QMS meetings will be documented by attendance records.
Critical Suppliers	The Rainy River Water Treatment Plant achieves oversight control over the activities of all suppliers of supplies and services annually through written communications and formal agreements. The written communications inform each supplier of policies and regulations with which the town must comply, as well as provides a list of all documentation that is required, such as NSF certification and MSDS's.
Public	Copies of the DWQMS Operational Plan will be available for viewing at Town Office. The Chief Administrative Officer at an open public council meeting will communicate updates and revisions.  Questions can be directed to the ORO. Annual Water Treatment Plant reports as per Ministry of the Environment guidelines are available to consumers in hard copy at the town office and can also be viewed on the Town of Rainy River website. Consumer water complaints can be handled through the Town Office or through the Water Treatment personnel. Refer to WTP Operations Manual for Procedure for handling water related complaints.

### 13. Essential Supplies and Services

Chlorine	Brenntag Canada Inc. 681 Plinquet Street, Winnipeg, MB. R2J 2X2 204 - 233 – 3416
Soda Ash	Cleartech
Filter Media	340 Saulteaux Crescent, Winnipeg, MB, R3J 3T2 800 - 387 – 7503
Aluminum Sulphate (Alum)	Border Chemical 595 Gunn Road, Transcona, MB R2C 5G2 1-800-493-8038
Clear Floc CP1065 (Polymer)	Clear Tech 340 Saulteaux Crescent, Winnipeg, MB R3J 3T2 1-800-387-7503 24-hour emergency 1-306-664-2522
Accredited Laboratory Services	ALS Laboratory Group 1081 Barton Street, Thunder Bay, ON. P7B 5N3 (807) 623 - 6463 Fax 807 - 623 - 7598
Chlorinator, Soda Ash parts	Alberta Mequipco Ltd. 2265 Pembina Hwy, Winnipeg, MB. R3T 5J3 (204) 982 -1040
Alum Pump parts	Romatec 1173 Michener Road, Sarnia, ON N7S 5G5 1-519-337-7416
Pump parts & repairs (high & low lift)	Mid Continental Pumps 1641 Dublin Ave., Winnipeg, MB. R3H OV5 (204) 783-8619
Hach & Instrumentation	Hach Sales & Service Canada Ltd. 134-1313 Rue Border, Wpg., MB R3H 0X5 (204) 632-5598
Bulk Fuel	Bluewave Energy Box 2240 Kenora, ON P9N 3X8 807-468-6150
Bill Romyn Vacuum Truck	483-5339 cell 275-7080
Process Flow	Lakeside Industrial Services 1165 Russell Street Thunder Bay, ON P7B 5M6

	Direct: 905-361-7090	Cell: 807-707-1905
	Main: 807-627-2792	Fax: 807-623-7907
	chris.foulds@lakesideindustrial.ca	
Salt for Ion Exchange Unit	Hardware Hank	
	Baudette,MN	218-634-3366
Emco Western Supplies Distribution System Components	Phone: 807-345-6453	Fax: 807-345-0090

All essential supplies are procured through a purchase order system maintained at the Town Office. All essential supplies must be NSF approved. The off loading of all supplies must be completed under the supervision of an operator. Laboratories must be licensed (accredited) and be close enough to receive samples within 24 hours.

**14. Review and Provision of Infrastructure** (Covered under Section 15)

**15. Infrastructure Maintenance, Rehabilitation and Renewal**

The Town of Rainy River has implemented a preventative maintenance program for the water supply system. Preventative maintenance schedules and procedures for the Water Treatment Plant are described in the Operations Manual. Preventative maintenance on the distribution system is performed on a regular schedule that is reviewed and updated by the ORO according to needs and priorities. Equipment and pumps at the WTP are regularly serviced and documented records are kept at the WTP in the equipment maintenance binder. Details of these procedures can be found in the WTP operations manual. Distribution system maintenance consists of flushing fire hydrants annually. When hydrants are flushed isolation valves are occasionally checked along with hydrant markers and visible identification numbers. The chlorine residual is also checked at this time. This information is documented on hydrant inspection forms, which are located in a binder at the public works building in the water distribution shop. When hydrant flushing is complete and if manpower is available, a valve-exercising program is started. This consists of physically operating main line valves and documenting the date's locations and problems found on valve inspection sheets located in a binder in the water distribution shop. This program is in the initial stages and is not yet fully implemented.

Rehabilitation and Renewal of the water supply system is performed on a needs schedule. Capital and operational money is allocated each year for improvements to the system. The Chief Administrative Officer and the Foreman determine the areas that the money will be spent.

A summary of all infrastructure maintenance, rehabilitation and renewal has been recorded in the

Town of Rainy River Maintenance Manuals. The adequacy of infrastructure is completed during an annual review of the system. Additionally, information for this review is derived from utilizing the Town of Rainy River's asset data collected as part of the new PSAB 3150 requirements.

This information is reviewed by the Foreman and the Chief Administrative Officer. The summaries are recorded in the annual summary report for Council to review.

## **16. Sampling, Testing and Monitoring**

The Rainy River Water Treatment Plant has a sampling program based on the requirements set out in Ontario Regulation 170/03 and our current Drinking Water Works Permit.

The sampling instructions are found within the Water Treatment Plant Operations Manual within the Town of Rainy River Sampling Instruction and Schedule.

The sampling, testing and monitoring results are recorded on the daily log sheet and summed up in the yearly summary report for Council.

## **17. Measurement and Recording Equipment Calibration and Maintenance**

### ***On-Line Measurement***

At present our on-line measurement devices consist of, filter effluent turbidity meters, treated water "free" chlorine residual analyzer, raw pH and conductivity probes and filter to waste turbidity meters.

Turbidity and chlorine analyzers are calibrated according to recommendations in the manufacturer's operation manuals and documented in the daily logbook and preventative maintenance manual.

Detailed procedures for calibrating each device are in equipment manuals cabinet.

### ***Distribution System Measurement***

The maintenance and calibration of the portable chlorine analyzer, turbidity meter, ph analyzers and lab spectrophotometer utilized within and out of the water system are completed according to the recommendations in the manufacturer's operations manuals. The records of calibration and maintenance are recorded in the Town of Rainy River preventative maintenance binder located at the water treatment plant.

### ***Laboratory Sampling***

A competent certified operator performs all in-house sampling. Results are recorded on a daily log sheet and monitored by plant operators. Detailed procedures for all tests performed on-site are provided in the operations manual. There is also a section in the manual devoted to adverse sample conditions.

An accredited laboratory performs all off site lab work. Bacteriological and chemical results from the accredited lab are faxed to the ORO at the Water Treatment Plant and filed.

Distribution chlorine levels are checked daily and weekly bacteriological sample sites. Results from the daily tests are recorded on the WTP log sheet. Results from the weekly tests are recorded on the lab chain of custody forms.

Copies of all bacteriological and chemical analytical results are provided to members of the public upon request. Furthermore, all results are summarized in tables at the end of the year and are discussed in the water plant annual compliance report. This report is also available to the public via the city website at [www.rainyriver.ca](http://www.rainyriver.ca) or in hardcopy form.

## **18. Emergency Management**

Detailed documented procedures for emergency situations, which could result in adverse water quality in the Drinking water supply system, are located in the **Water Treatment Plant Operations Manual** along with adverse water quality reporting procedures. The manuals are located at the Town of Rainy River Water Treatment Plant. All procedures to maintain a state of emergency preparedness are found in the Town of Rainy River's Water Treatment Plant Operations Manual.

### ***Potential Emergencies***

- Adverse Water Quality Results
  
- Chlorine Leak
  
- Water Main Break

- Source Water Contamination
  
- Bomb Threat

### *Emergency Response Training and Testing*

Emergency Response training and testing will take place in the form of orientation and education session for all operators and functional drills for operators.

### *Preparedness*

All operators in the Town of Rainy River have training and are aware of the locations of written procedures to deal with emergencies in the water treatment and distribution system. Twenty-four hour on call operators and Water Treatment Plant alarms ensure that a qualified staff member will attend and assess any emergency situation within a very short period of time. The emergency plan shall contain an up-to-date list of emergency contacts. If present methods should change or if new employees are brought into the system, semi- annual training would occur on dealing with emergency situations. Senior employees or direct supervisors would provide this training. All training would be documented and placed into employee personnel files.

### *Water Emergencies*

During working hours 9:00 am to 4:30 pm call the **Town Office - 852-3244** or the **Town Foreman - 271-0434** from 8:00 am to 4:30 pm.

After hours and weekends call 852-3244. The phone will be forwarded to the operator on call.

### *Water Service Problems*

If a customer calls with "no water, low water pressure" the operator shall be dispatched to confirm the water mains are functioning properly and there are no water main breaks. If the problem is not in the mains then the customer will be told to call a plumber. If a customer calls with a water quality problem such as odors or bad taste a Water Treatment Plant operator will be dispatched to assess the problem.

### *Water Treatment Plant Emergency Contact List*

Bob Jenson	Public Works Foreman/ORO	Ph: 271-0434
Leroy Hancharyk	Operator	Ph: 275-8761
Mike Scott	Operator	Ph: 852-1280/275-5557
Bennett Drennan	Operator	Ph: 852-3678/276-1307

After hours problems at the plants will be indicated by alarms, which will be attended to by the on-call operator.

### *Distribution System Emergency Contact List*

Bob Jenson	Public Works Foreman/ORO	Ph: 271-0434
Leroy Hancharyk	Operator	Ph: 275-8761
Mike Scott	Operator	Ph: 852-1280/275-5557
Bennett Drennan	Operator	Ph: 852-3678/276-1307

A full list of emergency situations and how to deal with them is found in the Standard Operating Procedures Manual at the Water Treatment Plant.

## **19. Internal Audits**

In accordance with the requirements of the DWQMS the Town of Rainy River has documented a procedure for internal audits

The procedure is titled QMS Internal Audit Procedure and is included as "Appendix B" in this Operational Plan.

## **20. Management Review**

In accordance with the requirements of the DWQMS the Town of Rainy River has documented a procedure for Management Review. The procedure is titled QMS Management Review Procedure and is included as "Appendix C" in this Operational Plan.

## **21. Continual Improvement**

The Town of Rainy River will establish and maintain a Drinking Water Quality Management System that will be regularly reviewed, improved and upgraded by management and employees involved in the supply of drinking water.

When appropriate the Town of Rainy River will modify/update/adjust processes and procedures (while remaining in compliance with MOE regulations) to improve operations and customer satisfaction.



## APPENDIX A

### DOCUMENT AND RECORD CONTROL PROCEDURE

**1.0 Procedure Description**

This procedure defines the processes in place to ensure control of all documentation and records affecting the Town of Rainy River DWQMS. This is necessary to ensure that creating; revising, approving and releasing documents are completed in a consistent manner to make certain they are retrievable, current and accurate.

**2.0 Reason for Procedure:**

To ensure control of documentation and records which affect the Town of Rainy River DWQMS

**3.0 Responsibility:**

The designated QMS Representative, (or the alternate), shall be responsible for the control of all QMS documents. All documents must meet the approval of the QMS Representative before initial or revision issuance.

**4.0 Procedure:**

The following list indicates the location and list of key documents that are relevant to the QMS

<i>List of Key Documents</i>	
<b>Document</b>	<b>Location</b>
Municipal Drinking Water License	WTP and Office
Permit to Take Water	WTP and Office
Water Treatment Plant Drinking Water Works Permit	Water Treatment Plant & Office
WTP System Classification	WTP 1 Town Office File
Water Distribution System Classification	Water Treatment Plant
DWQMS Operational Plan	WTP / Town Office
Maintenance Manuals	WTP
WTP Building and Site plans	WTP
Operator Certifications and Training	Town Office / WTP
Supplier List & Documentation	WTP
Treatment Operators Log Book	WTP

Distribution Operators Log Book	WTP
Calibration Manuals and Records	WTP
Equipment Maintenance Records	WTP
Lab Results	WTP and Town Office

All original documents and records of the Water Treatment Plant and Water Distribution System are kept at the Town Office located at 201 Atwood Avenue. Duplicate operational documents and records are located at the Water Treatment Plant.

The QMS Representative will keep all records necessary for the operation of the water treatment plant current and make any changes which are required. All documents shall have a Table of Revisions with a date of revision, and description of the revision. The QMS representatives shall sign the Operational Plan once each revision has been completed. The current documentation for the operations of the Water Treatment Plant is stored in clearly marked binders. All non-current log books or archival documentation shall be stored in clearly marked boxes in the file room at the Water Treatment Plant. The archival boxes shall be clearly identified by the documents contained within and include the year for which the documents were effective. All archived documents shall be retained as per O. Reg. 128/04 and O. Reg. 170/03.

The QMS Representative will review the Operational Plan on an annual basis prior to the audit to ensure the document contains current information.

The filing system at the Town Office is organized into numbered and titled documents filed into annual or project files. Files stored at the Town Office are retained according to the Town of Rainy River's retention by-law (minimum seven years) and upon expiration are shredded. All documentation related to water supply issues including operator training and certifications are added to existing files that are readily identifiable and retrievable in a designated storage cabinet in the Town file room. Some older records that are not relevant in day-to-day operations may be filed into a separate room upstairs at the Town building but can still be considered easily accessible. Daily log books and sampling records are filed at the WTP. Daily logs for the Water Distribution system are stored at the WTP.

## Appendix B

### QMS Internal Audit Procedure

#### 1.0 Procedure Description

This procedure defines the process used by The Town of Rainy River to conduct internal audits of the Drinking Water Quality Management System (DWQMS).

#### 2.0 Reason for Procedure

Internal audits are conducted to confirm that the DWQMS is effectively implemented and meets or exceeds the requirements of the DWQMS Standard.

#### 3.0 Responsibility

Internal audits shall only be conducted by persons approved by the DWQMS Representative and having the following qualifications:

- employees who have completed internal audit training.
- employees of other operating authorities who have completed internal audit training and who have completed a minimum of two internal audits of quality management systems within their own organizations.

#### 4.0 Procedure

- 4.1 This procedure is applicable to Town of Rainy River management, plant operations, and distribution activities that fall under the scope of the DWQMS.
- 4.2 Internal audits are conducted at least annually.
- 4.3 Internal auditors will be selected by the DWQMS Representative.
- 4.4 Internal auditors shall review DWQMS Standard and previous internal and third party audit reports in preparation for the audit.
- 4.5 The audit checklist created and maintained by the DWQMS Representative shall be used by the internal auditor as a guideline for conducting the interviews and document review during the audit.
- 4.6 The audit report shall be in the form of a completed audit checklist.
- 4.7 Corrective actions shall be identified and initiated using the corrective action form.
- 4.8 The audit is not closed until all non-conformances identified in the closing meeting have been corrected and the corrective action has been verified as being effective at

eliminating the root cause of the non-conformance.

- 4.9 The internal audit shall be considered closed upon submission of the audit report to the Management Review Committee.

## **5.0 Associated Documents**

- *Internal Audit Checklist*

# Appendix C

## Management Review Procedure

### 1.0 Procedure Description

This procedure defines the process for the review of the effectiveness of the Drinking Water Quality Management System (DWQMS) by the Management Review Committee.

### 2.0 Reason for Procedure

Management reviews are conducted to assess and ensure the continuing suitability, adequacy, and effectiveness of the DWQMS.

### 3.0 Responsibility

Management reviews shall be conducted during a meeting of the following participants:

- Chief Administrative Officer
- Public Works Foreman (ORO)

Other participants may be added at the discretion of the Management Review Committee.

### 4.0 Procedure

4.8 This procedure is applicable to The Town of Rainy River management, plant operations, and distribution and collection activities that fall under the scope of the QMS.

4.9 A management review shall be conducted at least once per year following completion and documentation of an internal audit and prior to the next scheduled third-party audit.

4.10 Prior to the Management Review Meeting, the QMS Representative or Alternate shall provide a meeting agenda and summaries of the following information to the Management Review Committee:

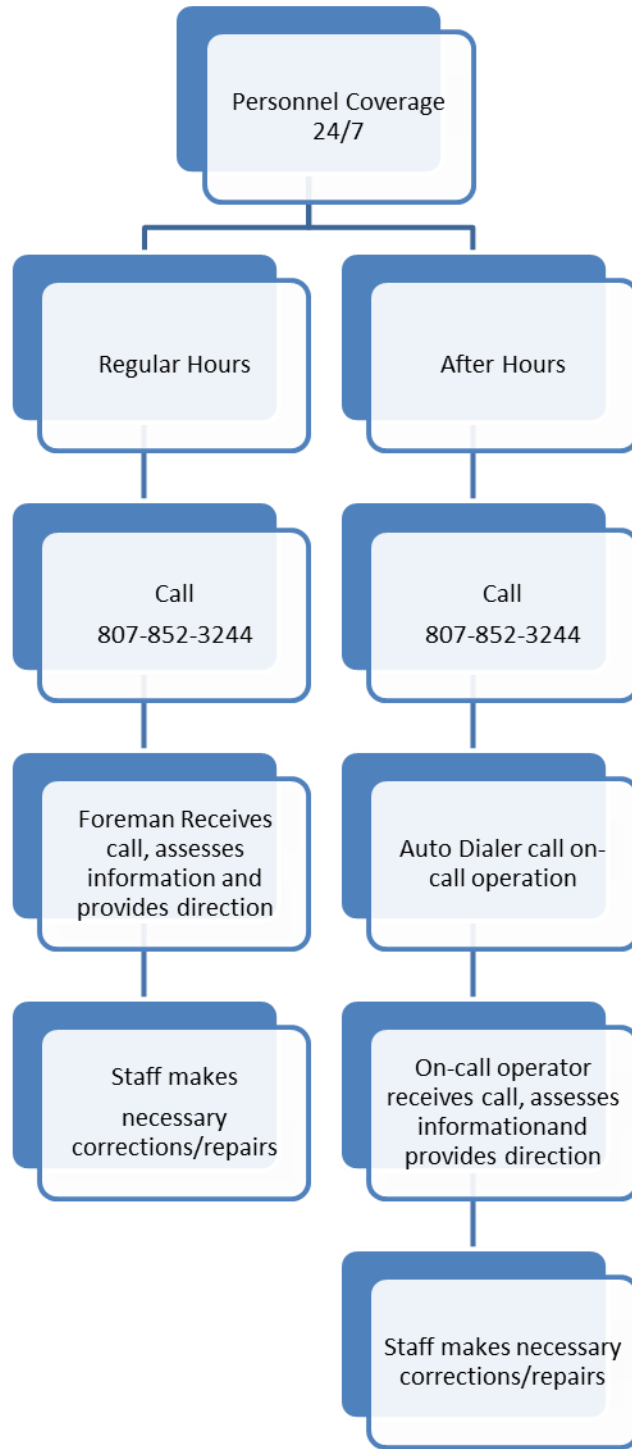
- Listing of incidents of regulatory non-compliance
- Incidents of adverse drinking water tests
- Deviations from critical control point limits and response actions
- The efficacy of the risk assessment
- Results of any relevant internal and third-party audits
- Results of emergency response training

- The status of management action items between reviews
  - The results of infrastructure review
  - Operational Plan currency, content and updates
  - Staff suggestions
  - Results of regulatory compliance inspections
  - Summary of customer complaints
  - Summary / trending of operational performance noting any deficiencies
  - Status of action-items from last Management Review
  - Raw water supply and drinking water quality trends.
  - Summary of Commission Meeting minutes pertaining to the QMS scope
  - Changes in process or management that may affect drinking water quality
  - Recommendations for improvement of the QMS
  - The resources needed to maintain the Quality Management System.
- 4.11 The Management Review Committee shall review and discuss all information presented. The Committee shall make recommendations and initiate action, as appropriate, to improve the content and implementation of the Operational Plan and related procedures, and to ensure the provision of adequate resources.
- 4.12 Minutes of management review meetings shall be maintained by the QMS Representative or Alternate. The minutes shall document all new and outstanding action items as well as any decisions made by the Committee.
- 4.13 The QMS Representative and Alternate shall be responsible for communication and implementation of the management review action items as per item DWQMS Communication procedure.

## **5.0 Associated Documents**

- *Internal Audit Checklist*

## APPENDIX D:



## APPENDIX K: INTERNAL AUDIT SCHEDULE

**Date of Revision:**

<b>Date</b>	<b>Process</b>	<b>DWQMS Element</b>	<b>Auditor(s)</b>
March 1, 2013	Operational Plan	All DWQMS Elements	DG
January 15, 2015	Operational Plan	All DWQMS Elements	JT
April 20, 2015	Operational Plan	All DWQMS Elements	JT
March 3, 2016	Operational Plan	All DWQMS Elements	JT
August 16, 2017	Operational Plan	All DWQMS Elements	JT
August 21, 2018	Operation Plan	All DWQMS Elements	JT