DOCUMENT CHANGE REQUEST FORM

Requested By: QMS Team **Date:** April 12, 2018

Department: O. & F. Division

Type of Change:

Edit Existing Document **Create New Document** **Delete Document**

Changes Requested:

1. Element 8 Risk Assessment Outcomes

Justification for Changes:

The following section is being revised to update the Town of Fort Frances Drinking Operation Plan.

1. The Ministry of the Environment and Climate Change approved revisions to the DWQMS Standard covering "Potential Hazardous Events for Municipal Residential Drinking Water Systems", which came into effect April 6, 2017. The hazards identified in the document are to be considered at the time of the next scheduled Risk Assessment. See attachment for listing of hazards.

Proposed Changes:

1. All the hazards identified in the "Potential Hazardous Events for Municipal Residential Drinking Water Systems" were considered. The following hazards were added to the Town's Risk Assessment., they are as follows:
   a) Long Term Impacts of Climate Change
   b) Source Water Supply Shortfall
   c) Extreme Weather Events
   d) Algal Blooms

   See attached Element 8 "Risk Assessment Outcomes". Additions have been identified in red.

Approval:

QMS Representative: [signature] **Date:** 17-04-2018

Comments:

8 Risk Assessment Outcomes

8.1 Introduction

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

8.2 Town of Fort Frances Risk Assessment

DESCRIPTION	LIKELIHOOD OF HAZARD OCCURRING	RATING
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 or quarterly basis.	4
VERY LIKELY	One or more occurrences on a monthly or more frequent basis.	5

DESCRIPTION	SEVERITY OF HAZARD OCCURRING	RATING
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 modifications to normal operations but manageable. Increase monitoring and operational requirements.	3
MAJOR	Major impact for small population, system significantly compromised and abnormal operation of it all.	4
CATASTROPHIC	Major impact for large population, complete failure of all systems.	5

DESCRIPTION	DETECTABILITY OF HAZARD	RATING
VERY DETECTABLE	Very easy to detect SCADA monitored.	1
MODEREATELY DETECTABLE	Moderately detectable, problem is indicated promptly by testing results.	2
NORMALLY DETECTABLE	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 detectable before a problem was evident; lab tests that are not done on a regular basis.	4
UNDETECTABLE	Undetectable, cannot detect.	5

The Town's Threshold Number is 8

TOWN OF FORT FRANCES RISK ASSESSMENT

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	CRITICAL CONTROL POINT	CRITICAL CONTROL LIMIT	Control Procedure
Source Water	Railway Activity (Spill of chemical or contaminant)	Chemical/ Biological Contamination of source water	Depends on location and type of Contamination	Notification to MOE Spills Action Centre of the spill and potential for contamination of source water.	Shut off raw water intake line valve. Stop producing water until plume passes. Run off water tower. Implement water restriction. Haul water, if necessary. Test water raw & treated.	1	4	3	8	YES	No Controllable limit	Refer to Emergency Response Binder (ERB) – S.O.P. #6 for Raw Water Source Contamination
	Highway Accident (Spill of chemical or contaminant)	Chemical/ Biological Contamination of source water	Depends on location and type of Contamination	Notification to MOE Spills Action Centre of spill and potential for contamination of source water.	Shut down intake. Stop producing water until plume passes. Run off water tower. Implement water restriction. Haul water, if necessary. Test water raw & treated.	1	2	1	4	NO		
	Fuel Storage Tanks	Chemical/ Biological Contamination of source water	Depends on location and type of Contamination	Notification to MOE Spills Action Centre of spill and potential for contamination of source water.	Shut down intake. Stop producing water until plume passes. Run off water tower. Implement water restriction. Haul water, if necessary. Test water raw & treated.	1	4	2	7	NO		
	Proximity of septic fields on Rainy Lake	Biological Contamination of source water		Conventional water treatment operations to treat source water. Weekly bacteriological testing of raw & treated water. Continuous monitoring for chlorine & filtered water turbidity.		1	1	5	7	NO		

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Source Water	Collapse or breakage of single intake pipe	Quantity/ Quality		Low lift pumps shut down on low-level alarm.	Run off water tower. Implement water restriction and haul water, if necessary.	1	4	1	6	NO		
	Long Term Impacts of Climate Change	Quality/ Quantity			Adjust Process	1	3	1	5	NO		
	Source Water Supply Shortfall	Quality/ Quantity		Visual	Water Restrictions	1	4	1	6	NO		
	Extreme Weather Events (e.g., tornado, ice storm)	Quality/ Quantity		Visual		1	5	1	7	NO		
Treatment	Failure of SCADA	Quantity/ Quality			Run on manual.	2	2	1	5	NO		
	High lift pump Failure	Quantity/ Quality		Low Pressure.	Back up pumps.	2	1	1	4	NO		
	Loss of Coagulant – Plugging of lines, pump failure.	Biological & Chemical contamination	Crypto/ Giardia not removed with out coagulant	Pump failure alarm. Pump overload alarms. Critical Control Limit for filter effluent turbidity is set at 0.8 NTU (Regulatory Limit - 1.0 NTU), which causes an alarm and immediately shuts down the filter.	If main coagulant is not applied, restore as soon as possible with back up system. Monitor turbidity and chlorine residuals for any exceedance. Report to MOH and MOE, SAC as per O. Reg. 170/03.	2	3	1	6	NO		Switch to backup system, which is on-line and ready to go.

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Treatment	Loss of Polymer Plugging of lines, pump failure.	Shorter filter runs		Backwash alarm. Visual inspections throughout the day.	Repair polymer feed system. Note: If turbidity reading exceeds 1.0 NTU, causes an alarm. If two alarms 15 min. intervals or more apart and the Owner has not reported an exceedance in the 24 hrs. prior to this and the filter effluent is directing water to the next stage of the treatment process, then the exceedance is reportable. Report to MOH & MOE, SAC per O. Reg. 170/03.	3	2	1	6	NO		
	Flocculator failure	Shorter filter runs		Backwash alarm. Visual inspections throughout the day. Alarms on rake drive & mixer.	Repair parts on hand. Note: If turbidity reading exceeds 1.0 NTU, causes an alarm. If two alarms 15 min. intervals or more apart and the Owner has not reported an exceedance in the 24 hrs. prior to this and the filter effluent is directing water to the next stage of the treatment process, then the exceedance is reportable. Report to MOH & MOE SAC per O. Reg. 170/03.	1	3	1	5	NO		
	Backwash pump failure	Quantity/ Quality		Alarms on backwash pump and filter backwash.	Spare backwash motor & ability to use high lift pumps.	1	1	1	3	NO		

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Treatment	Filter breakthrough or Under drain failure	Biological contamination	Crypto/ Giardia not removed with out coagulant	On –line filter effluent turbidity meters. Critical Control Limit for filter effluent turbidity is set at 0.8 NTU, (Regulatory Limit - 1.0 NTU), which causes an alarm and immediately shuts down the filter.	If turbidity reading exceeds 1.0 NTU, causes an alarm. If two alarms 15 min. intervals or more apart and the Owner has not reported an exceedance in the 24 hrs. prior to this and the filter effluent is directing water to the next stage of the treatment process, then the exceedance is reportable. Report to MOH & MOE SAC per O. Reg. 170/03.	2	4	1	7	NO		
	High Turbidity off filters	Biological & Chemical contamination		On –line filter effluent turbidity meters. Critical control limit for filter effluent turbidity is set at 0.8 NTU, (Regulatory Limit - 1.0 NTU), which causes an alarm and immediately shuts down the filter.	Take filter off line and repair.	2	2	1	5	NO		Take filter off line and repair.
	Vandalism	Quantity/ Quality		Plant Alarms	Visual monitor	1	2	1	4	NO		
	Fire	Quantity/ Quality		Plant Alarms	Refer to Emergency Response Binder (ERB) – S.O.P. #1 for the Destruction (Bombing/Major Fire) of Water Treatment Plant or Water Tower	1	5	1	7	NO		

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Treatment	Power Failure	Quantity/ Quality		Plant Alarms	Emergency back-up generator comes on-line.	1	5	1	7	NO		
	Chemicals - Poor Quality	Quantity/ Quality	Guaranteed by Supplier	Plant Alarms Upsets Process	Stop using and order replacement	1	5	1	7	NO		All chemicals are NSF/ANSI certified
	Chemicals - Unavailability	Quantity/ Quality	Keep in stock two (2) week supply		Contact alternate suppliers	1	3	2	6	NO		
	Algal Blooms	Chemical/ Biological		Depends on location, duration and type of algae.	Shut down intake. Stop producing water until plume passes or treat water.	1	5	1	7	NO		
Primary Disinfection	Chlorinator failure	Biological Contamination	Bacteria & Viruses not inactivated without chlorine	On line chlorine analyzer alarm. Critical control limit 1.10 mg/L.	Switch to standby chlorinator & spare parts to make repairs. Note: if CT requirements not met report to MOH & MOE SAC per O. Reg. 170/03.	1	5	1	7	NO		Switch to standby chlorinator & spare parts to make repairs.
Reservoir	Loss of structural integrity of reservoir- leakage into reservoir.	Biological & Chemical Contamination		On line chlorine analyzer. Weekly bacteriological testing. Daily treated water analysis.	Isolate one (1) reservoir. Notify MOH & MOE SAC. Drain, repair, clean and disinfect per AWWA procedures, increase chlorine dosage and issue water restrictions.	1	4	1	5	NO		

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Distribution	Breakage of single pipe from plant to distribution system	Quantity/ Quality	Run from water tower as long as possible	Low level tower alarm.	If system pressure compromised. Report to MOH & MOE SAC. Repair, flush distribution system, increase chlorine and conduct sampling in distribution system.	1	5	1	7	NO		Refer to Emergency Response Binder (ERB) – S.O.P. #3 for Water Main Breaks and Repairs
	Loss of chlorine residual (Secondary disinfection)	Biological Contamination	Legislated under O. Reg. 170/03	Daily residual at water tower, weekly monitoring at locations in town.	Report to MOH & MOE SAC as required by O. Reg. 170/03. Flush system increase chlorine dosage and resample.	2	3	2	7	NO		See O Reg. 170/03 requirements for corrective actions
	Loss of pressure due to a water main break or major fire	Biological & Chemical Contamination		Customer Complaints, low level alarm at water tower.	If system pressure compromised and potential for backflow exists, report to MOH & MOE SAC. Follow procedure for water main breaks and repairs. Refer to Emergency Response Binder (ERB) – S.O.P. #3 for Water Main Breaks and Repairs.	3	2	3	8	YES	Tower: 6m – 8m Reservoir: 3600mm – 5000mm	See Appendix "D" Standard Operating Procedure for Flushing of Water Mains
	Cross Connection	Biological & Chemical Contamination	Backflow prevention devices	Visual / high risk.	If backflow suspected, report to MOH & MOE SAC. Isolate area, flush the system and sample as needed. Re-pressurize system.	1	3	4	8	YES	No Controllable limit	See Appendix "D" Standard Operating Procedure for Flushing of Water Mains

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Distribution	Water Tower Structural / Contaminated	Quantity/ Quality Biological & Chemical Contamination		Low pressure/Low level.	Isolate water tower.	1	2	3	6	NO		
	Hypo Pump Failure (Plugged)	Biological & Chemical Contamination		Low chlorine residual in distribution system.	Switch lines, repair/replace defective pump with spare pump at water plant/tower.	3	1	3	7	NO		
	Bio-film	Quantity/ Quality		Weekly checks	Refer to Appendix "D" S.O.P. for Flushing of Water Mains	1	3	3	7	NO		