CITY OF IQALUIT

EMERGENCY RESPONSE PLAN

FOR CONTINUED SUPPLY OF SAFE POTABLE DRINKING WATER

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CITY OF IQALUIT

DRAFT

PROJECT NO.: 211-12497-00
DATE: APRIL 05, 2023

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April 05, 2023

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TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

TABLES

FIGURES

1 INTRODUCTION

Safe and reliable drinking water is vital to every community. Emergency response planning is an essential part of managing a drinking water system. Most public water systems have had routine operating emergencies such as pipe breaks, pump malfunctions, bacteriological contamination, and power outages. These are manageable if the water system has an emergency response plan that can be put into action. More serious non-routine emergencies may result from intentional acts of vandalism, chemical spills, floods, earthquakes, windstorms, or droughts. These can drastically affect the system and the community that depends on it.

Each emergency has unique effects on different parts of a water system. Floods can cause widespread bacterial contamination, earthquakes can damage water sources, distribution systems, and treatment systems, and storms can disrupt power supplies. The common element is that each emergency may threaten the system's ability to deliver potable and palatable drinking water. Emergency response planning is a process by which water system managers and staff explore vulnerabilities, make improvements, and establish procedures to follow in an emergency. Preparing a response plan and practicing it can save lives, prevent illness, enhance system security, minimize property damage, and lessen the overall burden of a catastrophic event and the cost associated.

1.1 PURPOSE

The Water System Emergency Response Plan has been prepared to guide the City of Iqaluit and response agencies in responding to an emergency in the City's water system. This document will serve as a general approach for responding to emergency scenarios. These scenarios are intended to capture general water system emergencies, a list of actions, notifications, and recovery guidelines.

1.2 OBJECTIVES

The objectives of the Water System Emergency Response Plan are the following:

- Provide an efficient and coordinated response to an emergency event
- Provide procedures for notifying the public during an emergency event
- Ensure that water quality and public health are not compromised
- Ensure that water for fire fighting is available
- Protect the natural environment from impacts associated with the system's operation in the event of an emergency
- Restore the system to the normal operation

1.3 SCOPE

The plan is intended for use by the City of Iqaluit staff in responding to emergency scenarios related to the water system serving the community. This plan is an internal document for City staff implementation, improvement, and use only. This document serves informational purposes only to external parties.

1.4 HOW TO USE THIS PLAN

The Water System Emergency Response Plan is meant to act as a guide in the event of a water system emergency. This is important because the plan is written to act as a reference rather than an explicit set of instructions. The more familiar everyone is with the format and information within the plan the more helpful it will be in the event of a real emergency.

Section 2 describes the emergency management team, roles, and responsibilities as well as a communication plan and reporting forms.

Section 3 lists potential water system emergencies and actions to be taken to deal with each emergency. It is essential that this section be reviewed in advance because the lists are intended to act as only a reference for guiding one through the respective emergency. Contacts for organizations that are referenced and located in other sections throughout the document can be found in the *Emergency Contact List* (**Appendix A**).

Another vital component of the plan is the post-emergency response. An internal document referred to as the *Post Emergency Report* (**Appendix C**) should be filled out after each water system emergency. This should typically be prepared by the Public Works Superintendent. However, to allow this process to be as straightforward as possible, personnel that executes actions should complete an *Emergency Record Action Form* at the time they execute their actions. This form asks the individual to list out each of the actions taken along with the time and date the action was executed. The form also provides space for post-incident comments.

The record-keeping allows participants the chance to provide comments and recommendations about the ERP in which they followed while allowing the City to retain a detailed account of the actions taken to alleviate the water system emergency. The *Emergency Record Action Form* and the *Post Emergency Report* will help improve emergency response for the following year.

It is recommended that this ERP is reviewed and updated annually, and that training and coordination on the contents of this document is provided annually (or as required).

1.5 DEFINITIONS

1. **Command Post:** A location near the site of the incident where emergencies can be coordinated.
2. **Disaster:** An occurrence caused by man or nature that causes destruction and distress to people or property in terms of operation, safety, and environment.
3. **Emergency:** A serious, unexpected, and often dangerous situation requiring immediate action.
4. **ERP:** Emergency Response Plan.
5. **Hazard:** Exposure or vulnerability to injury or loss.
6. **Hazard Analysis:** The identification of potential hazards that lead to emergencies that should be addressed in the ERP.
7. **Risk Assessment:** The process of assessing the likelihood of an adverse event occurrence.

1.6 SYSTEM OVERVIEW

The City of Iqaluit provides potable water to a population of approximately 8,000 inhabitants that reside in eight (8) subdivisions across The City. The water system is comprised of the following components:

- Lake Geraldine (Raw Water Source)
- Lake Geraldine Dam and Raw Water Intake
- Water Treatment Plant (WTP)
- Potable Water Reservoir
- Piped Distribution Network
- Two (2) Booster Stations
- Three (3) Reheat Stations

It should be noted that several water utility users are supplied via truck fill. At present, all trucks are fill filled via at Booster Station #1. The Iqaluit WTP also has a truck fill station that can be used in the event that Booster Station #1 is non-operational, or for supplemental supply.

Figure 1-1 depicts the water system components as well as some points of interest in the community.

Figure 1-1: Water system components.

1.6.1 RAW WATER SOURCE

Raw water is sourced from Lake Geraldine, a reservoir designed to contain the volume of water necessary to satisfy the drinking water needs of the City. The reservoir is refilled annually during spring and summer by natural inflows from snowmelt and precipitation. It is estimated to have a capacity of approximately 1.8 million cubic metres, with up to 1.1 million cubic metres available during winter months. In years when natural inflows or precipitation are low, the reservoir does not fill to full capacity, resulting in a potential shortage of available drinking water for the City. Raw water from the Lake Geraldine is conveyed to the WTP via a 360 m long and 350 mm diameter gravity line. The injection of tempered water from the plant protects the water line from freezing.

1.6.2 WATER TREATMENT

The Iqaluit Water Treatment Plant (WTP) is designed for a maximum day capacity of 9,500 m^3/d to meet water demands and provide fire protection. The treatment train comprises four process elements including UV disinfection, filtration, chlorine disinfection, and fluoridation. Upon entering the WTP, raw water is conveyed to two (2) UV reactors for primary disinfection. Downstream of the UV, water is filtered through dual media (anthracite and sand) rapid filtration operating four (4) units in parallel to remove particulate matter. Backwash and filter-to-waste flows are conveyed to holding tanks to allow a controlled release to the sewer system. Downstream of the filters, chlorine gas is injected as a secondary disinfectant, and fluoridation is performed (hydrofluorosilicic acid).

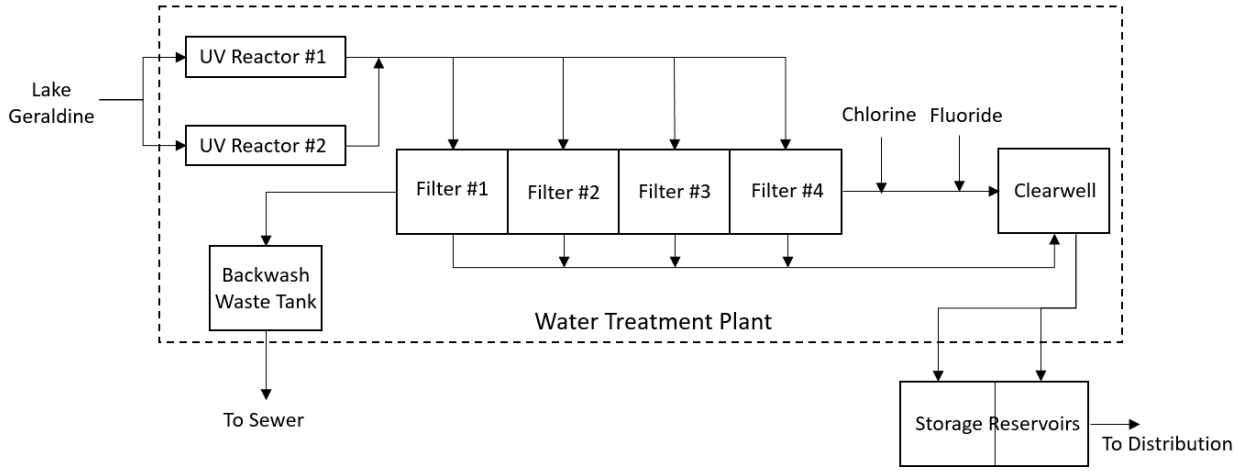

Figure 1-2: Water treatment processes.

1.6.3 DISTRIBUTION SYSTEM

A network of watermains and recirculation lines, bleeders, reheating stations, and a booster station distribute water to the City. Approximately 27 km of watermains are installed in the City with diameters from 300 to 500 mm. Freeze protection is required to ensure the integrity of the distribution system is not compromised by water freezing in the mains. Freeze protection is achieved through constant circulation, heat input, and reliable circulation patterns. Water is first tempered within the water treatment plant such that it leaves the main reservoir at approximately 5°C. Water circulates to one of three re-heat stations to replace the heat lost from the distribution system and to maintain circulation. The re-heat stations typically contain boilers, heat exchangers, and circulating pumps. Water is also discharged from bleeders to maintain continuous flow in some areas. Bleeders are small diameter pipes attached to the end of a watermain. Bleeders allow water to constantly flow from the end of the watermain and into a sanitary sewer to prevent freezing.

1.7 HAZARD IMPACT ANALYSIS

A preliminary hazard analysis was conducted to identify the impact of various threats and hazards on the components and operation of the water system as summarized in **Table 1-1**. This analysis should be reviewed and validated by the key stakeholders and updated at least once per year or when there is a change in any of the components of the water system.

Table 1-1: Hazard analysis.

Threats & Hazards		1 - Earthquake	2 - Hurricane / High-Winds	3 - Tornado	4 - Snowstorm	5 – Floods	6 – Drought	7 - Other Severe Weather	8 – Waterborne Disease	9 - Hazardous Materials	10 – Hydrocarbon / Fuel Contamination	11 - Chemical Spill	12 - Chemical Overdose	13 - Chemical Shortage	14 – Disinfection / Chlorination System Failure	15 – Fire (Structural)	16 - Construction Incidents	17 - Raw Water Shortage	18 – Algal Blooms	19 – Cross-Connections	20 – Vehicle Impact	21 - Power Interruption	22 – Disgruntled Employee	23 – Shortage Of Qualified Maintenance Labour	24 – Bioterrorism	25 – Distribution System Break	26 – Scada/Plc Failure	27 – Reservoir Line Breakage	28 – Unauthorized Operation	29 – Vandalism	30 – Backflow Or Back-Siphonage	31 – Shallow Groundwater Excursions	32 - Loss Of Intake Tempering System	33 – Fuel Shortage (Diesel)	34 - Loss Of Reheat Station
System Components																																			
Administration / Operations	Personnel	X	X	X	X	X										X	X						X												
	Facilities / Equipment	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
	Records	X	X	X		X										X							X					X							
Source Water	Watershed						X		X	X	X	X						X	X						X										
	Reservoir and Dams	X	X				X		X	X	X	X				X	X	X	X		X				X				X						
	Tempering System	X	X														X		X		X		X	X	X	X				X	X	X	X		
Transmission	Intake Structure	X	X	X			X				X	X					X	X												X					
	Pump Station	X	X	X			X			X	X	X				X	X	X			X	X	X	X			X			X				x	
	Pipelines and Appurtenances	X	X	X						X	X	X					X				X									X	X				
Treatment	Facilities Structures	X	X	X												X	X				X		X	X						X	X				
	Equipment	X	X	X			X		X	X	X	X			X	X	X	X	X		X	X	X	X	X		X			X	X			x	
	Controls	X	X	X											X	X	X				X	X	X	X						X	X				
	Chemicals	X	X	X					X				X	X	X	X	X	X	X		X				X					X	X				
Storage	Tanks	X								X	X	X																			X				
	Piping & Valves	X	X	X						X	X	X										X	X	X						X	X				

Threats & Hazards		1 - Earthquake	2 - Hurricane / High-Winds	3 - Tornado	4 - Snowstorm	5 – Floods	6 – Drought	7 - Other Severe Weather	8 – Waterborne Disease	9 - Hazardous Materials	10 – Hydrocarbon / Fuel Contamination	11 - Chemical Spill	12 - Chemical Overdose	13 - Chemical Shortage	14 – Disinfection / Chlorination System Failure	15 – Fire (Structural)	16 - Construction Incidents	17 - Raw Water Shortage	18 – Algal Blooms	19 – Cross-Connections	20 – Vehicle Impact	21 - Power Interruption	22 – Disgruntled Employee	23 – Shortage Of Qualified Maintenance Labour	24 – Bioterrorism	25 – Distribution System Break	26 – Scada/Plc Failure	27 – Reservoir Line Breakage	28 – Unauthorized Operation	29 – Vandalism	30 – Backflow Or Back-Siphonage	31 – Shallow Groundwater Excursions	32 - Loss Of Intake Tempering System	33 – Fuel Shortage (Diesel)	34 - Loss Of Reheat Station
Distribution	Pipelines and Appurtenances	X	X	X						X	X	X								X	X	X	X	X		X			X	X	X	X			
	Booster Stations	X	X	X							X	X								X				X			X		X	X	X	X		x	
	Reheat Stations	X	X	X							X	X												X			X		X	X	X	X		x	X
	Level of Service	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X					X		X		X	X	X	X	X	x	X
Electric Power	Generator	X	X	X												X	X				X	X	X	X					X	X				x	
	Transmission Lines	X	X	X	X											X	X													X					
Communications	Telephone	X	X	X	X												X						X	X						X					
	Radio		X														X						X	X						X					
	Telemetry	X	X	X													X						X	X			X		X	X					
Transportation	Airport	X	X	X	X																														
	Port & Waterway	X	X	X																															
	Roadways	X	X		X																														

1.8 RISK ASSESSMENT

A preliminary risk assessment was conducted as summarized in Table 1-3. This assessment should be reviewed and validated by the key stakeholders and updated at least once per year or when there is a change in any of the components of the water system. The step to conduct the assessment includes:

1. Gather the key stakeholders in a workshop setting
2. Review and identify new potential hazards
3. Conduct a risk assessment to determine the likelihood and severity of the hazards as the proposed risk matrix (**Table 1-2**).
4. Assign a risk score to the hazards
5. Sort the risk scores from High to Very Low. Develop plans and procedures to reduce, remove or mitigate High and Moderate risk.

Table 1-2: Risk assessment matrix.

CONSEQUENCES					LIKELIHOOD			
SEVERITY	**PEOPLE**	**ASSETS**	**ENVIRONMENT**	**REPUTATION**	**1**	**2**	**3**	**4**
					Heard of it in the industry	Has happened in the organization or more than once a year in the industry	Has happened at the location or more than once a year in the organization	Has happened more than once per year at the location
1	No injury or health effect	No damage	No effect	No impact	Very low	Very low	Low	Low
2	Minor injury or health effect	Minor damage	Minor effect	Moderate – Regional public concern	Very low	Low	Moderate	Moderate
3	Major injury or health effect	Major damage	Major effect	Major – National public Concern	Low	Moderate	Moderate	High
4	Fatality	Massive damage	Massive effect	Critical – International public concern	Low	Moderate	High	High

Table 1-3: Risk assessment.

HAZARD	LIKELIHOOD	SEVERITY	RISK RANKING
Hydrocarbon / Fuel Contamination	Moderate	High	High
Chemical Spill	High	Moderate	High
Chemical Shortage	Moderate	High	High
Fire	Moderate	High	High
Raw Water Pipeline Break	High	Moderate	High
Tornado	Moderate	High	High
Hurricane / High-winds	Low	High	Moderate
Snowstorm	Moderate	Low	Moderate
Floods	Moderate	Low	Moderate
Drought	Moderate	Moderate	Moderate
Waterborne Disease	Low	High	Moderate
Hazardous Materials	Low	High	Moderate
Disinfection / Chlorination System Failure	Low	High	Moderate
Raw Water Shortage	Moderate	Moderate	Moderate
Vehicle Impact	Moderate	Moderate	Moderate
Power Interruption	Moderate	Moderate	Moderate
Disgruntled Employee	Low	Moderate	Moderate
Shortage of Qualified Maintenance Labour	Moderate	Moderate	Moderate
Distribution System Break	Moderate	Moderate	Moderate
SCADA/PLC Failure	Low	Moderate	Moderate
Vandalism	Low	Moderate	Moderate
Backflow or Back-Siphonage	Low	Moderate	Moderate
Chemical Overdose	Low	Low	Low
Earthquake	Moderate	Low	Low
Algal Blooms	Very Low	Moderate	Low
Cross-connections	Very Low	Moderate	Low
Bioterrorism	Very low	High	Low
Unauthorized Operation	Very low	High	Low
Loss of Intake Tempering System	Very low	High	Low
Loss of Reheat Station	Very low	Moderate	Low

1.9 EMERGENCY CLASSIFICATION

Emergencies usually have a wide range of severity. Defining categories of severity can significantly aid in determining appropriate response actions and notifying the correct agencies to assist with the emergency. Knowing the severity of the emergency and being able to communicate it to others will help system personnel keep their response balanced and effective.

Decision-making on severity should be collaborative among system personnel who could be potentially involved in emergency mitigation. The individual in charge may also choose to coordinate with external

parties, especially if partnerships have been formed and are part of the ERP contacts. The information for making the decision will progressively increase over time and may result in the level of severity being changed and other actions required.

After an assessment of the severity, the assessment must be communicated immediately to all those dealing with the emergency. Make sure personnel have cell phones and/or radios (in case of cell service is unavailable) when they are in the field assisting.

Table 1-4: Emergency classification.

TYPE OF EMERGENCY	INDICATOR	RESPONSE TIME	TYPICAL EXAMPLES
Type I Routine	System personnel are able to handle the problem with minimal assistance. The situation is unlikely to negatively impact public health.	Within 24 hours	Distribution line leaks, breaks, PRV failure, fractured fire hydrants, service leaks Short power outages Minor mechanical problems
Type II - Minor	Minor disruption in supply or has indications of possible contamination where it may need to coordinate with health authority and consider issuing an advisory to customers	Within 8 hours	Disruption in supply with a potential for backflow and loss of pressure. Storage is not adequate to handle disruption in supply An initial positive bacteriological sample (E. coli) An initial primary chemical contaminant sample Disinfection failure A minor act of vandalism
Type III - Significant	The system experiences significant mechanical or contamination problems where disruption in supply is inevitable and assistance from health authority is needed	Within 4 hours	A confirmed positive sample for pathogen (E. coli, Cryptosporidium, Giardia Lamblia, etc) or primary contaminant requiring immediate consideration of a boil water advisory notice to customers A loss or complete malfunction of the WTP for surface water treatment, including residual disinfection A major line break or other system failure resulting in a water shortage situation or requiring system shutdown to a significant part of the water distribution network An act of vandalism or terrorism
Type IV - Major - Catastrophic	Major damage or contamination from a natural disaster, an accident, an act of terrorism, and/or vandalism.	Immediate	Chemical spill that comes into the immediate area of the system's source(s) High flood that infiltrates into system Act of terrorism possibly contaminating the water system with biological or chemical agents Storm that significantly damages power grid and system operations

2 EMERGENCY PLAN ADMINISTRATION

This section contains administrative information relating to the community response team organization and communication procedures.

2.1 EMERGENCY MANAGEMENT TEAM

The Emergency Management Team (EMT) is comprised of the personnel listed below during a water system emergency.

Table 2-1: Emergency management team.

ROLE	PERSONNEL	PHONE	EMAIL
WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
Public Works Clerk	Sue Avery	867- 222-2971	S.Avery@iqaluit.ca
Communications and Customer Service Manager	Aleksey Cameron	867- 222-85052	A.Cameron@iqaluit.ca
Environmental Health Officer (EHO)	Wilfred Ntiamoah	867- 975-5772	wntiamoah@gov.nu.ca
Fire Services Representative	Stephen McGean	867-222-5073	S.McGean@iqaluit.ca
Police Services Representatives (Operations NCO)	Robert Daley	N/A	robert.daley@rcmp-grc.gc.ca

2.2 ROLES AND RESPONSIBILITIES

The members of the EMT have the following responsibilities as listed in the table below. The Director of Public Works will perform the role of Emergency Coordinator for Water System Emergency.

Table 2-2: Emergency management team roles and responsibilities.

ROLE	RESPONSIBILITIES DURING EMERGENCY	PLANNING AND ADMINISTRATION
WTP Lead Operator	- Reports incidents - Take action if safe to do so	
Director of Public Works	- Classify emergency - Assemble EMT as required and act as primary contact - Keep EMT apprised through regular briefing meetings - Call EMT debriefing meeting once the emergency is over to review the records and documentation kept by all members - Complete debriefing report - Arrange for repairs by local staff or external contractors (including necessary equipment)	- Emergency Coordinators in the area and Maintain updated contact information for government agencies and emergency coordinators - Ensure Emergency Plan is updated and implemented annually, including updating supplies/materials needed to execute ERP - Coordinate ERP drills - Arrange for operator training and certification - Keep system plans/drawings and manuals updated - Keep equipment and spare parts updated
Chief Administrative Officer (CAO)	- Be available to make decisions to support the EMT - Declare a State of Local Emergency if required - Communicate with government (federal) agencies if required - Contact Emergency Services and EHO as required	- Monitor Emergency Plan development and implementation - Maintain updated contact information with government agencies
Communications and Customer Service Manager	- Handle all media contacts and public notification - Gather information of the community impacted by the emergency	- Maintain updated contact information with local media
Environmental & Health Officer (EHO)	- Provide advice on the handling of emergencies. - Make contact with other external agencies who could provide assistance/advice in an emergency	- Monitor water quality
Public Works Clerk	- Implement community notification procedures - Support EMT during an emergency - Arrange site for Emergency Operation Center if needed	- Maintain updated contact information for volunteers who could help in an emergency - Regularly update Emergency Plan
Fire Services Representative	- Contact the local Fire Department - Provide fire and rescue services - Call for additional assistance as required	- Ensure all firefighters are trained and list of volunteers is updated - Make contact with Fire Chiefs in neighboring areas and maintain updated contact information - Keep all firefighting equipment in good working order and updated following Firefighter Code of Practice.
Police Services Representatives	- Contact RCMP - Provide law enforcement, security and traffic control	

2.3 INITIAL RESPONSE

Once an emergency has been identified, the Director of Public Works must meet with the EMT to discuss the situation and assign responsibility. Immediate action may have already gone underway prior to this meeting but it is imperative that duties and responsibilities be formally assigned to manage the emergency as effectively as possible. This meeting does not have to be held in person and can be facilitated by telephone conference if the situation is warranted. Discuss the emergency response strategy including:

- The level of emergency
- Extent of the affected area
- Need for external resources
- Response strategy
- Communications/media relations strategy
- Schedule the next meeting

2.4 COMMUNICATION PLAN

Depending on the emergency it may be necessary to notify a variety of government agencies. Type III and Type IV emergencies will typically require notification to be done immediately; however, professional discretion at the management level is expected. Type I and Type II emergencies are solely at the discretion of management whether other agencies are to be involved or notified.

The line of communication for emergency notification is described below.

Procedure for Emergency Notification

1. The utility operator in charge will assess the situation and take immediate action.
2. The utility operator will notify Public Works (PW) Superintendent,
3. PW Superintendent notifies Chief Administrative Officer (CAO), Communications Manager, and EHO.
4. CAO and Communications Manager will develop public service announcement (PSA).
5. Communications Manager will notify the public as follows:
    - Post PSA to City website and social media accounts.
    - Notify local radio station, television, and newspaper.
    - Organize delivery of hard copy PSAs to affected households.
7. WTP Operations staff continuously update the City and regulatory agencies on water advisory
8. Once resolved, notify customers of rescinding notices.

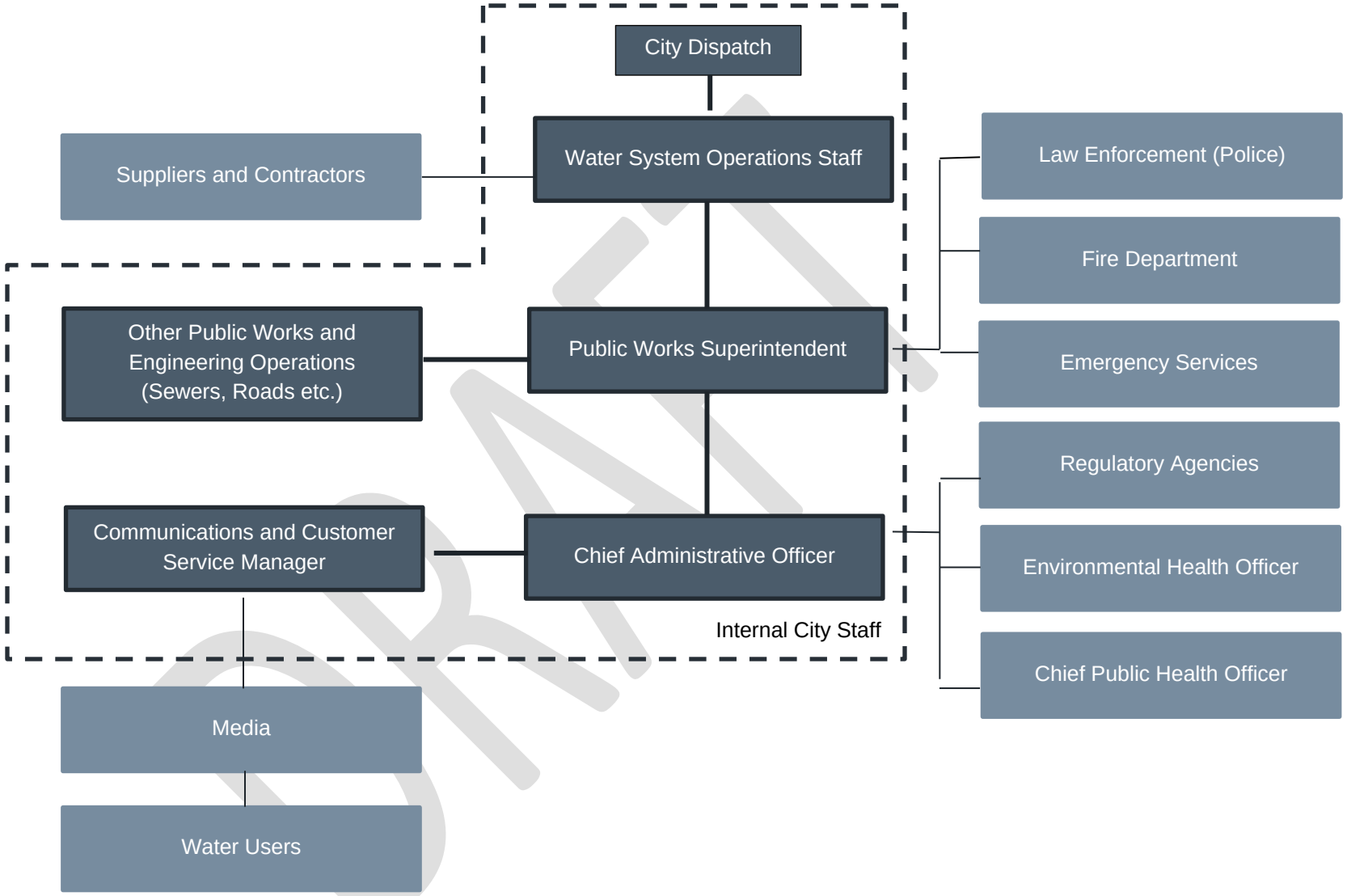

Figure 2-1: Emergency notification line of communication.

2.4.1 EFFECTIVE COMMUNICATION

Effective communication is a key element of emergency response. Developing partnerships with others in the local emergency response network, establishing relationships with customers and the media, and creating communication tools such as fact sheets and media releases ahead of time will aid in communicating efficiently and successfully during a crisis. All questions and concerns should be directed to the designated spokesperson.

Table 2-3: Communication tips.

DO	**DO** NOT
• Document everything known about the crisis • Identify key points that should be made available to the media • Designate a spokesperson • Provide complete, accurate, and timely information • Anticipate likely questions • Acknowledge uncertainty and offer to get back with more information later • Document all communications	• Speculate on the cause or outcome of an incident • Blame or debate • Minimize or discredit concerns of customers

2.4.2 DESIGNATED SPOKESPERSON

The designated spokes person during a water system emergency is the Communications and Customer Service Manager. The alternate spokes person is the Chief Administrative Officer.

DESIGNATED MEDIA SPOKESPERSON	**ALTERNATE**
Communications and Customer Service Manager	Chief Administrative Officer

2.4.3 KEY MESSAGES

Develop possible messages in advance and update them as the emergency develops. A standard message format is provided below.

- *We are taking this incident seriously and doing everything we can to resolve it*
- *Our primary concern is protecting our customers' health*
- *Another important concern is keeping the system operational and preventing damage*
- *What we know right now is [most accurate as possible description of the situation]*
- *As we gather facts information will be distributed*

- *We have contacted regional and local authorities to help us respond effectively and to correct the current situation as soon as possible*
- *If you think you may be ill or need medical advice, contact your local physician or go to the emergency room of the hospital*
- *We are sampling the water and doing tests to determine whether there is a potential cause of contamination*

2.5 EMERGENCY CONTACT LIST

The following is the contact list to use in case of an emergency. A copy of the list should be available at each facility of the water system.

Table 2-4: Emergency contact list.

ROLE / DEPARTMENT	PERSONNEL	PHONE	EMAIL
WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
Public Works Clerk	Sue Avery	867- 222-2971	S.Avery@iqaluit.ca
Communications and Customer Service Manager	Aleksey Cameron	867- 222-85052	A.Cameron@iqaluit.ca
Environmental Health Officer (EHO)	Wilfred Ntiamoah	867- 975-5772	wntiamoah@gov.nu.ca
Fire Services Representative	Stephen McGean	867-222-5073	S.McGean@iqaluit.ca
Police Services Representatives (Operations NCO)	Robert Daley	N/A	robert.daley@rcmp-grc.gc.ca
Emergency Services			
Qikiqtani General Hospital		867-975-8600	
Fire, Ambulance, Police		867-979-4422	
Iqaluit Fire Department		867-979-1111	
Fire Chief	Stephen McGean	867-222-5073	
Non-emergency Emergency Services Dispatch		867-979-5650	
Iqaluit Fire Department		867-979-1111	
Director of Emergency Services / Fire Chief	Monday – Friday Daytime	867-979-5653	
Deputy Director of Emergency Services / Fire Chief	Monday – Friday Daytime	867-979-5657	
Regulatory Agencies			
Spill Reporting		867-920-8130	
Nunavut Emergency Management Services	Emergency 24 hours	867-979-6262	

	Director of Nunavut Emergency Services	867-975-5477	
City of Iqaluit Mayor	Solomon Awa	867-979-5600	
Premier of Nunavut	P.J. Akeeagok	867-975-5050	
Utilities			
Qulliq Energy Corporation (Electricity and Power)		867-222-3807	
Repair Services / Suppliers / Testing / Consultants			
Aquatic Life Ltd.	Jeff Simpson	204-753-5270	
Aquatic Life Ltd.	Steven Simpson	800-409-8378 ext 113	
WSP Canada Inc.	Justin Rak-Banville (Treatment)	204-259-1525	
WSP Canada Inc.	Charles Goss (Treatment)	204-259-1677	
WSP Canada Inc.	Matt Sider (SCADA)	250-876-3110	
ALS Environmental Laboratories	Winnipeg	204-255-9720	
Caduceon Environmental Laboratories	Ottawa	613-526-0123	
Media			
Radio	CBC Radio One Iqaluit		
Television	CBC North		
Newspaper	Nunatsiaq News	867-979-5357	

2.6 REPORTING

All aspects of the emergency event, and any communications to the public, shall be documented. During the emergency, the Emergency Record Action Form is intended to record the actions taken along with the time and date the action was executed. Upon resolution of the emergency, a Post Emergency-Report shall be submitted to the EMT for internal review. Template forms are enclosed in Appendix B.

3 ACTION PLAN FOR POTENTIAL EMERGENCIES

This section provides details on suggested action plan applicable to potential water system emergencies.

3.1 CONTAMINATION AT WTP (HYDROCARBONS)

Emergency Classification: Type III, IV

Hydrocarbon / fuel contamination may occur from diesel fuel entering potable water reservoirs. An S::CAN is in place to detect high and high-high levels of hydrocarbons in treated water.

1. Inform PW Superintendent, Communications Manager, CAO, that high-high alarm setpoint of S::CAN has been reached.
2. CAO to inform EHO and Emergency Management Services as soon as reasonably possible.
3. Cease water treatment processes and initiate emergency *WTP bypass per WTP-SOP-003 Initiating Emergency WTP Bypass.*
4. Conduct contamination investigation following *WTP-SOP-004 Procedures for Contamination Investigation* in parallel with initiating emergency bypass if resources permit. If resources are not available, conduct a contamination investigation after an emergency bypass has been initiated.
5. If raw water enters the distribution system, or contaminated water enters the distribution system, inform the CAO, and Communications Manager.
6. EHO and CPHO to issue "Boil Water Advisory".
7. Communications Manager to notify water users of water disinfection failure and distribute advisory notice.
8. Submit samples to an environmental monitoring laboratory, and report results to EHO.
9. EHO and CPHO to review water quality results and, if satisfactory, rescind advisory.
10. Contact WSP Canada for technical support after the contamination investigation has been completed to determine the next steps to return the plant to normal service.

3.1.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Public Works Clerk	Sue Avery	867- 222-2971	S.Avery@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca

	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	WSP Canada Inc.	Justin Rak-Banville	204-259-1525	Justin.Rak.Banville@wsp.com
	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	

3.2 CONTAMINATION OF SOURCE (MICROBIOLOGICAL)

Emergency Classification: Type II, III

Microbiological contamination of source water may result in waterborne diseases. The most common microbes of concern are Escherichia coli (*E. coli*) and total coliforms (TC), which are tested as a part of the City's routine monitoring program.

1. If a site tests positive for *E. coli* and/or TC, Operator is to resample and retest the positive site and adjacent sites. Samples shall be sent to an environmental lab for rush results. Notify Public Works Superintendent.
2. If re-tests still show as *E. coli* and TC positive, communicate with Communications Manager and CAO.
3. CAO to communicate with EHO and CPHO.
4. EHO and CPHO to issue "Boil Water Advisory".
5. Communications Manager to notify water users of water disinfection failure and distribute advisory notice.
6. Operator and Public Works Superintendent to investigate the source of contamination and implement corrective actions. If the source water is contaminated, close the intake.
7. Operator is to retest two more samples from the positive site and adjacent site. If both samples are negative for both *E. coli* and TC, water is considered safe.
8. EHO and CPHO to rescind "Boil Water Advisory".

3.2.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Public Works Clerk	Sue Avery	867- 222-2971	S.Avery@iqaluit.ca

External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	

3.3 CONTAMINATION OF SOURCE OR SECONDARY SYSTEM (HAZARDOUS MATERIALS)

Emergency Classification: Type II, III

Hazardous materials refer to non-microbiological pathogens, such as metals or pesticides, that pose a risk to human health. These contaminants may enter the source water or the distribution system watermains. Hazardous materials are typically tested annually and therefore these materials may be difficult to identify in the system. Additional testing should be performed if water quality complaints are received, or if an activity that may release hazardous materials into the source water or distribution system occurs.

1. If a site tests positive for hazardous material, the Operator is to resample and retest the positive site. Samples shall be sent to an environmental lab for rush results. Communicate with Public Works Superintendent.
2. If re-tests are still positive for the hazardous material, communicate with Communications Manager and CAO.
3. CAO to communicate with EHO and CPHO.
4. EHO and CPHO to issue “Do Not Consume” notice.
5. Communications manager to notify water users of water disinfection failure and distribute advisory notice.
6. CAO and Public Works Superintendent to arrange for the provision of bottled water for users.
7. Operator and Public Works Superintendent to investigate the source of contamination and implement corrective actions. If temporary treatment systems are required, contact the EHO and CPHO. If the source water is contaminated, close the intake.
8. Operator to take water quality samples once per day until two successive samples are of acceptable water quality. At this point, the water is considered safe to drink.
9. EHO and CPHO to rescind “Do Not Consume” notice.

3.3.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca

	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	

3.4 CHEMICAL SPILL

Emergency Classification: Type III, IV

A chemical has been spilled or gas has been released resulting in an uncontrollable and unconfined release to the environment (river, ground, air, etc.).

1. Identify the product that has been spilled.
2. Assess size, type and location of spill. If the spill has, or can, enter any components of the water treatment process reservoirs or distribution system, inform the Public Works Superintendent immediately.
3. Obtain MSDS.
4. Use proper PPE including appropriate respiratory protection for a specific chemical.
5. Confine spill to the smallest area possible using sandbags, absorbent, and diking. Isolate the area of spill using “Danger” tape and/or barricades.
6. Evacuate all-nonessential personnel from the spill area.
7. If safe to do so, neutralize chemicals using chemical spill kits.
8. If applicable, report the spill to Public Works Superintendent and TDG, and complete a spill reporting form. (Appendix B)
9. Dispose of all used spill control products in accordance with applicable standards and regulations. Replenish spill kit.

3.4.1 CHEMICAL SPILL REPORTING PROCEDURE

Transportation of Dangerous Goods (TDG) requires that chemicals spilled, lost, stolen, or misplaced during transient or unloading must be reported to the Local Police Department, Environment and Climate Change Canada, Owner of the vehicle, and Shipper of the product. Complete a thirty-day (30) follow-up report if requested by Environment and Climate Change Canada.

For chemical spills that occur at the Iqaluit WTP, refer to the table below for spill reporting conditions per the TDG.

SUBSTANCE	REPORTING CONDITIONS TO BE FOLLOWED
Chlorine Gas	Report releases of any amount.
Hydrofluorosilicic Acid	Report releases greater than 5 L or 5 kg.
Diesel	Report releases of 100 L or greater.

3.4.2 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
External	TDG Spill Reporting		867-920-8130	
	Environment and Climate Change Canada (ECCC)	Curtis Didham	867-975-4644	Curtis.Didham@ec.gc.ca

3.5 CHEMICAL SHORTAGE

Emergency Classification: Type II, III

Chemical shortages may result from the supply chain or logistical challenges.

1. Operator to identify chemicals experiencing shortages and inform Public Works Superintendent.
2. If both chlorine gas (primary disinfectant) and sodium hypochlorite (backup disinfectant) are in short supply and disinfection requirements cannot be met, CAO to communicate with EHO and CPHO. Next, the EHO and CPHO to issue a “Boil Water Advisory” and Communications Manager to notify water users.
3. If hydrofluorosilicic acid is in short supply, modify WTP operations to not fluoridate potable water. This shortage will not impact potable water production rate. Communications Manager is to issue public announcement stating that treated water will not be fluoridated and CAO is to inform EHO.
4. Public Works Superintendent to communicate with suppliers to expedite provision of chemical.

3.5.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca

3.6 FIRE

Emergency Classification: Type III, IV

1. All personnel to evacuate the building, leaving doors closed.
2. First responder to assess whether fire can be extinguished using fire extinguisher.
3. If fire can be extinguished safely, first responder on site shall extinguish fire.
4. If fire cannot be contained using a fire extinguisher, call 867-979-4422.
5. Once outside at the muster point, take roll call of all persons onsite.
6. Open all gate accesses to the plant or facility for fire department.

3.6.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
External	Fire Department		867-979-4422	

3.7 RAW WATER PIPELINE BREAK

Emergency Classification: Type III, IV

This refers to a failure or major leak in the raw water intake pipeline delivering raw water from Lake Geraldine to the Iqaluit WTP. This watermain is the sole source of water for the City of Iqaluit.

1. Operator to isolate damaged section(s) of main.
2. Operator to notify Chief Operator, Public Works Superintendent, Communications Manager and CAO.
3. Develop and implement plan for raw water intake pipeline repair or replacement.
4. If the pipeline failure will interrupt the supply of water for more than 6 hours:
    a. Communications Manager to issue “Mandatory Conserve Water” notice.
    b. Public Works Superintendent to organize alternate water supply (bottled water or bulk water tanker).
5. Develop and implement plan for water quality sampling and flushing if required. Send water quality samples to environmental laboratory.

6. After the water quality is confirmed to be acceptable and pipeline is repaired/replaced, the CAO is to rescind the previous notice. The Communications Manager is to advise the public of the rescindment.

3.7.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	

3.8 HURRICANES, HIGH-WINDS, TORNADO, EXTREME SNOW/BLIZZARD

Emergency Classification: Type III, IV

This section refers to hurricanes, high-winds, tornadoes, and extreme snow/blizzard conditions that may impact the Iqaluit WTP or Iqaluit distribution system.

1. Public Works Superintendent to monitor Environment Canada weather forecasts for extreme weather conditions.
2. Public Works Superintendent to adjust the schedule for water (truck) delivery and sewage (truck) pickup to maximize the number of customers served prior to extreme weather onset.
3. Utility operators to perform manual inspections of pump, booster, and reheat stations to ensure they are all in working order prior to the extreme weather event.
4. Communications Manager to issue “Voluntary Conserve Water” notice, as required.
5. Operator to notify Chief Operator, Public Works Superintendent, Communications Manager, and CAO of any damage to water infrastructure resulting from severe weather.
6. CAO to notify EHO and CPHO.
7. EHO and CPHO shall issue a “Boil Water Advisory” and/or “Voluntary Conserve Water” notice.
8. Communications Manager to notify water users of notice.
9. CAO to contact Nunavut Emergency Management Services for advice and assistance.
10. CAO and Director of Public Works to arrange an alternate source of water, as available and required. Coordinate with other public works departments, local emergency services and fire department as required.
11. Follow directives from Nunavut Emergency Management and EHO to bring WTP back online.

3.8.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	ALS Environmental Laboratories		204-255-9720	

	Caduceon Environmental Laboratories		613-526-0123	

3.9 FLOOD

Emergency Classification: Type III, IV

This section refers to flooding at the Iqaluit WTP or Lake Geraldine intake.

1. Operator to notify Chief Operator, Public Works Superintendent, Communications Manager, and CAO.
2. The Public Works Superintendent to coordinate the construction of a damming structure around the WTP building and direct flow away from the site.
3. CAO to notify EHO and CPHO.
4. EHO and CPHO to issue a “Boil Water Advisory”.
5. Communications Manager to notify and advise water users to reduce water and sewer use.
6. CAO to contact Nunavut Emergency Management Services for advice and assistance.
7. CAO and Public Works Superintendent to arrange an alternate source of water (bottled water). Coordinate with local emergency services and fire department, as required.
8. Public Works Superintendent to arrange for the WTP operator to disinfect the treated water infrastructure (treated water storage tanks/reservoirs and distribution pipes, as required) to the appropriate AWWA Disinfection Standards (i.e., C651 and C652) after the flood cedes. Operator to take water quality samples and send to an environmental laboratory for analysis.
9. After the water quality is confirmed to be acceptable, EHO and CPHO to rescind “Boil Water Advisory”.

3.9.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	ALS Environmental Laboratories		204-255-9720	

	Caduceon Environmental Laboratories		613-526-0123	

3.10 DROUGHT

Emergency Classification: Type III, IV

Drought will result in raw water shortage, and decreased water quality, in Lake Geraldine.

1. Operator to notify Public Works Superintendent, Communications Manager, and CAO.
2. CAO to notify EHO, Iqaluit mayor, and Iqaluit fire department.
3. Communications Manager to issue “Mandatory Conserve Water” notice.
4. CAO to contact Nunavut Emergency Management Services and the Government of Nunavut for advice and assistance.
5. Coordinate with government agencies to develop a plan for identifying a temporary alternative to provide water to consumer (i.e., supply of bottled water, operation of temporary treatment units).
6. Communications Manager to issue public service announcements with information on where and how consumers can access the water.
7. Lead Operator and Public Works Superintendent to evaluate whether Iqaluit WTP should continue operating or if the WTP should be taken offline. If the WTP is to be taken offline, the intake should also be closed.
8. After the drought episode ends, coordinate with government agencies for the removal of temporary treatment units.
9. Chief Operator and Public Works Superintendent to return Iqaluit WTP to normal operation.

3.10.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
	City of Iqaluit Mayor	Solomon Awa	867-979-5600	S.Awa@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	Fire Department		867-979-1111	

	Premier of Nunavut	P.J. Akeeagok	867-975-5050	

3.11 CHLORINATION SYSTEM FAILURE

Emergency Classification: Type II, III

1. Operator to assess the nature and cause of the problem. If the issue is a chlorine gas leak, evacuate the building and do not return until safe to do so.
2. Notify the Chief Operator and Public Works Superintendent.
3. If possible, switch over from the chlorine gas system to the backup sodium hypochlorite dosing system.
4. If the backup sodium hypochlorite system cannot be operated, or if un-chlorinated water entered the distribution system, inform the CAO and Communications Manager. CAO to inform EHO and CPHO.
5. EHO and CPHO to issue a “Boil Water Advisory”.
6. Communications Manager to notify water users of water disinfection failure and distribute advisory.
7. Repair chlorination system failure.
8. Operators to flush affected areas until chlorine residual is within guidelines.
9. Submit samples to an environmental monitoring laboratory.
10. CAO to report water quality sampling results to EHO.
11. EHO and CPHO to rescind advisory.

3.11.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	

3.12 SCADA/PLC FAILURE

Emergency Classification: Type II, III

In the event of failure of the SCADA system, there will be potential short-term or long-term disruption of service to the water users as a result of loss of communication at pump stations, or to and from automated controls.

1. Operator to determine cause of failure.
2. If the failure is as a result of software failure, notify the Public Works Superintendent. If failure is a hardware failure, skip to step 5.
3. Determine the impacts of the failure and confirm that all equipment is operating as intended.
4. Implement temporary schedule for manually checking all SCADA monitored equipment, including a manual check of each pump station and PRV.
5. If the failure is as a result of hardware failure, notify the Public Works Superintendent and trouble shoot the SCADA system and make necessary repairs.
6. Contact CAO if there is any impact to the provision of drinking water.

3.12.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	ALS Environmental Laboratories		204-255-9720	
	Caduceon Environmental Laboratories		613-526-0123	
	PLC and SCADA Engineer	Matthew Sider	867-332-8223	Matt.Sider@wsp.com

3.13 POWER INTERRUPTION

Emergency Classification: Type II,III

Power to the Iqaluit WTP and water distribution system is supplied by the NTPC power grid. As Nunavut does not have shared transmission grid, back-up power to the community is supplied using emergency generators and imported diesel fuel.

1. WTP Lead Operator to inform Public Works Superintendent and contact Qulliq Energy Corporation to determine the status of the power outage.
2. WTP Lead Operator to manually check and ensure all process equipment was restarted properly. If the process equipment did not restart properly, or if the power remains interrupted, operations staff are to operate the treatment equipment manually. This includes, but is not limited to, operating the valves manually, manually adding sodium hypochlorite to the treated water tanks, monitoring chlorine concentrations at the WTP and in the distribution system via handheld instrumentation, and monitoring water levels in the treated water reservoir.
3. Determine if the water quality has been compromised and if so, notify CAO who will notify EHO.
4. Communications Manager to provide public service updates as required.
5. Monitor equipment regularly during a power outage.
6. Once power has been restored, ensure all equipment has restarted properly.
7. Replenish battery stock as required.

3.13.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Qulliq Energy Corporation (Electricity and Power)		867-975-5772	

3.14 DISTRIBUTION SYSTEM BREAK

Emergency Classification: Type II, III

Some of the distribution system piping is above ground. Breaks may occur from vehicular impact, frozen pipe (such as by failure of pipe heating system or reheat station), or construction in surrounding areas which may impact distribution system infrastructure. A distribution system break can cause loss of system pressure, and minor to severe water loss.

1. Isolate break at nearest valves.
2. Contact Public Works Superintendent, CAO and Communications Manager immediately.

3. CAO is to contact EHO and CPHO.
4. EHO and CPHO to issue “Boil Water Advisory” if required.
5. Communications Manager to notify water users of advisory if required.
6. Repair water main as quickly as possible following the *AWWA C651 Disinfection of Watermains.*
7. If required, CAO and Public Works Superintendent are to arrange for alternate water supply.
8. Once repair is completed, flush and disinfect affected watermains. Conduct sampling in accordance with instructions from EHO.
9. After watermain is re-instated, EHO and CPHO to issue “Water System Recovering” notice and inform users to flush home plumbing.

3.14.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	

3.15 SHORTAGE OF QUALIFIED LABOUR

Emergency Classification: Type II,III

Shortage of qualified labour, such as shortage of operators or maintenance staff, may impact normal plant operations.

1. Inform Public Works Superintendent and CAO of labour shortage.
2. Public Works Superintendent and CAO to review available staffing resources and adjust worker schedules if possible. Evaluate impact of labour shortage.
3. If the labour shortage will significantly decrease WTP production rate (ex. insufficient qualified operators, lack of maintenance staff available to perform urgent repairs etc.), CAO is to contact Nunavut Emergency Management Services. If required, develop temporary water supply plan (bulk delivery, bottled water etc.) to reduce demand on WTP. CAO is to contact EHO prior to changing

water supply plans, and Communications Manager is to issue “Voluntary Water Use Restriction” notice.

4. If the WTP can continue production at a normal rate for an extended period, or if equipment repair / maintenance is not urgent, CAO and Public Works Superintendent are to evaluate feasibility of retaining contractors to fill short term gaps.

3.15.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	

3.16 BACKFLOW OR BACK-SIPHONAGE

Emergency Classification: Type II,III

Backflow or back-siphonage occurs if untreated water is drawn into the distribution system through a cross connection or the system experiences negative pressures due to breaks or leaks. Backflow can cause contamination in the distribution system.

1. Identify source of backflow and isolate area by closing off nearest valves.
2. Contact Public Works Superintendent, CAO and Communications Manager immediately.
3. CAO is to contact EHO and CPHO.
4. EHO and CPHO to notify public of water service disruption and issue “Boil Water Advisory” if required.
5. Communications Manager to notify water users of advisory if required.
6. Repair water main as quickly as possible following the *AWWA C651 Disinfection of Watermains.*
7. If required, CAO and Public Works Superintendent to arrange for alternate water supply.
8. Once repair is completed, flush and disinfect affected watermains. Conduct sampling in accordance with instructions from EHO.

9. After watermain is re-instated, EHO and CPHO to issue “Water System Recovering” notice and inform users to flush home plumbing.

3.16.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	

3.17 VEHICLE IMPACT

Emergency Classification: Type II

Vehicle impact may damage the WTP, reheating and pumping stations, and distribution system piping.

1. Inform Public Works Superintendent and Emergency Services (if required). If criminal activity is suspected, contact law enforcement.
2. Assess severity of damage, identify health and safety risks, and determine whether normal operation can continue. If the impact has resulted in chlorine gas leak in the WTP, evacuate the building and do not return until deemed safe by Emergency Services.
3. If the WTP cannot produce potable water because of the damage, contact CAO and Communications Manager. CAO is to contact EHO and CPHO and arrange for alternate water supply.
4. EHO and CPHO to issue Water Use Restriction Notice and “Boil Water Advisory” (if there is possibility of contamination in distribution system).
5. Communications Manager to notify water users of advisory.
6. If pumping station or distribution system piping is damaged, refer to Section 3.15 Distribution System break.
7. Public Works Superintendent is to arrange for contractors to repair damage.

3.17.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	Emergency Services		867-979-4422	
	Director of Emergency Services / Fire Chief (daytime)		867-979-5653	

3.18 VANDALISM

Emergency Classification: Type I, II

Potential vandalism could range from graffiti spray painted on infrastructure to deliberate tampering with water system controls, damage to distribution system infrastructure, or contamination of tanks.

1. Contact law enforcement if criminal activity is suspected.
2. Determine whether contamination to water system may have occurred.
3. If potential contamination is suspected, advise Public Works Superintendent and CAO. CAO to contact EHO and determine extent of vandalism and take appropriate action, including required public notification and whether alternate water supply should be provided.
4. If the suspected contaminated water is within the distribution system:
    a. Flush suspected main and/or service connection. Isolate main to ensure directional flush.
    b. Take water samples at nearest downstream sampling station and at closest cold water service. When water is sampled from the service, ensure that the tap has run long enough for sampling of water within the main. Test for residual chlorine, fecal/non fecal coliforms, and any suspected chemicals that may have entered the water supply.
5. If location of Suspected Contaminated Water is within reservoir or pump station:
    a. Take one sample from the reservoir and at least two within the distribution system.
    b. Isolate reservoir or shut down the pump station until the results are received.

c. CAO and Public Works Superintendent to arrange for alternate water supply as required.

6. Report sampling results to EHO and proceed at advice of EHO.

3.18.1 CONTACT INFORMATION

AGENCY	CONTACT PERSON		PHONE	EMAIL
Internal	WTP Lead Operator	Peter Martel	613- 662-9447	P.Martel@iqaluit.ca
	Utilidor Manager	Pat Wolfe	867- 222-2424	P.Wolfe@iqaluit.ca
	Public Works Superintendent	Shane Turner	867- 222-2165	S.Turner@iqaluit.ca
	Director of Public Works	Simon Doiron		S.Doiron@iqaluit.ca
	Director of Engineering	Sumon Ghosh		S.Ghosh@iqaluit.ca
	Chief Administrative Officer (CAO)	Rod Mugford	867- 979-5667	R.mudford@iqlaluit.ca
	Customer Service Manager	Aleksey Cameron	867-222-8502	A.Cameron@iqaluit.ca
External	Environmental Health Officer (EHO)	Wilfred Ntiamoah	867-975-5772	wntiamoah@gov.nu.ca
	Nunavut Emergency Management Services (24 hour)		867-979-6262	
	Emergency Services		867-979-4422	
	Director of Emergency Services / Fire Chief (daytime)		867-979-5653	

4 WATER ADVISORY NOTICES

Advisory notices can be issued when water quality issues are identified in the water system. The decision to issue a water advisory must be made by the CPHO based on information provided by City Leadership. The Department of Health have procedures in place to be able to communicate with the public, the council and the media. Sample advisory notices are provided in **Appendix E**.

4.1 "BOIL WATER ADVISORY"

Information in this section is based on a document titled "Guidance for Issuing and Rescinding Boil Water Advisories" (**Appendix E**). The decision to issue a "Boil Water Advisory" is a serious one and is the responsibility of the CPHO. City Leadership provides the information necessary to make the decision.

4.1.1 ISSUING A "BOIL WATER ADVISORY"

An advisory may be issued if any of the following scenarios occur:

- Noticeable deterioration in treated water quality
- Failure of disinfection or distribution equipment
- Very low or negative pressure in the distribution system
- Poor water quality (chemical or microbiological)
- Other situations where it is suspected/confirmed that the drinking water may be responsible for an outbreak.

A "Boil Water Advisory" usually involves the following:

- Any water that may be used for drinking, brushing teeth, washing food, ice cubes, etc., must be brought to boil for a minimum of one minute to inactivate the contaminant.
- Usually, shower, bathe, or do laundry without the need for boiling, but this will be evaluated on an individual basis.
- Additional measures may be necessary if there is an outbreak like adding a dilute bleach solution for handwashing.

4.1.2 RESCINDING A "BOIL WATER ADVISORY"

The "Boil Water Advisory" is usually revoked when testing of two or more consecutive samples indicates that the water quality has returned to compliance or the source of the contamination has been corrected, and there has been enough treated water moved to flush the distribution system.

5 POST-EMERGENCY RECOVERY

Once the emergency has been effectively mitigated, if a water quality advisory has been issued, the Environment Health Officer will provide direction to safely begin producing potable water. The water users should also be notified that the water is again safe to drink and of the steps that need to be taken to effectively flush their home plumbing.

During the Post Emergency Recovery, the City should assess whether the response was successful and what needs to be updated in the Plan. A Post Emergency Report should be filled out for all emergencies to reflect on and improve the emergency response procedures. The Post Emergency Report template is enclosed in **Appendix E**.

6 TRAINING

All water system staff should be trained on the content of the ERP. The following is a list of possible types of exercises, based on their complexity. The complex exercises require much more time to plan and execute, so they should be designed with critical risks in mind. Table 6-1 shows proposed training frequencies.

It is important to note:

- All exercises, regardless of complexity, should be designed to succeed. They are intended to build confidence and are never directed at individual responses.
- Safety must NEVER be compromised during any exercise.
- Ensure that all staff is told in advance when an exercise is scheduled so that they know it is not a real emergency.

Table 6-1: Proposed training frequency.

TYPE OF EXERCISE	PARTICIPANTS	FREQUENCY
Fire/Evacuation Drill	All employees in each water system facility	Twice a year
Fire Extinguisher Training	All employees in each water system facility	Once a year
General ERP Review & Discussion	All employees, EMT	Once a year
Tabletop Scenario Assessment	All employees, EMT	Once a year
Mock Emergency Response Exercise	All employees, EMT	Every other year

6.1 ERP REVIEW & DISCUSSION

All personnel included in the ERP should be familiar and comfortable with its contents. The ERP should be reviewed annually for relevance, modifications to personnel assignments, updates to contact information, and other new or emerging emergency response conditions.

6.2 TABLETOP SCENARIO ASSESSMENT

Every year, the emergency response scenarios should be reviewed to identify any changes to the system since the last iteration. During the scenario assessments, employees should determine a plausible emergency situation and create a series of events within it (any of the emergency response conditions outlined in Section 3.1 through Section 3.18 of this document). The employees “role-play” their actual responses to the simulated emergency. This provides a more in-depth analysis of the portion of the ERP and is more likely to pick up any actions that need to be modified in the following iteration.

6.3 MOCK EMERGENCY RESPONSE EXERCISE

This type of exercise involves actual physical participation by all individuals. They can be used to test a specific part of the ERP and may be simple or very complex. Examples range from a fire drill/evacuation or fire extinguisher training to a confined space rescue or a simulated chemical spill.

The mock emergency response training program should be designed to fit the specific response measures for the mock scenario, but should include the following:

- Describe the mock emergency response exercise that is to be performed.
- Develop exercise to test the objectives of the exercise.
- Confirm a date, time, location, and a list of required participants and resources well in advance of the exercise.
- Execute the exercise and debrief with all participants. The debriefing should be done as soon as the exercise is completed. The objective of a debriefing is to determine if any changes are required to the emergency response.
- Amend the ERP based on the findings of the mock emergency response scenario as required, and provide written notification to those whose actions have changed based on the amendment.
- Keep records of all exercises.

7 DOCUMENT DISTRIBUTION AND UPDATES

7.1 DISTRIBUTION

The Water System ERP is a controlled document. One master copy should be kept electronically in a secure location. This is the version that should be accessed first in the event of an emergency.

Hard copies should be available at the following locations:

- Water Treatment Plant
- Public Works Office
- Fire department

A distribution list containing contact information of those involved in the ERP activities as well as other stakeholders with interest in the ERP (such as government and regulatory agencies) should be retained and updated from time to time. Updates and new iterations to the ERP should be provided to those on the distribution list as they are made.

Portions of the document such the emergency contact list should be available in all vehicles, and facilities.

7.2 UPDATES

It is recommended that a specific review be performed annually to ensure that all the sections are up to date. A review of all reporting forms should be conducted to identify issues and improve the effectiveness of the ERP.

Emergency Telephone Numbers should be reviewed every 3 to 6 months to keep the phone numbers current. Pick a few at random and call them to confirm that they are correct, if there are errors, it is recommended that all numbers on the list be verified.

APPENDICES

APPENDIX – A

EMERGENCY CONTACT LIST

ROLE / DEPARTMENT	PERSONNEL	PHONE	ALTERNATE PHONE	FAX	EMAIL
Emergency Management Team					
WTP Lead Operator	Peter Martel	613-662-9447			P.Martel@iqaluit.ca
Utilidor Manager	Pat Wolfe	867-222-2424			P.Wolfe@iqaluit.ca
Public Works Superintendent	Shane Turner	867-222-2165			S.Turner@iqaluit.ca
Director of Public Works	Simon Doiron				S.Doiron@iqaluit.ca
Director of Engineering	Sumon Ghosh				S.Ghosh@iqaluit.ca
Rod Mudford- Chief Administrative Officer (CAO)	867-979-5667	Rod Mudford- Chief Administrative Officer (CAO)			R.Mugford@iqaluit.ca
Communications and Customer Service Manager	Aleksey Cameron	867- 222.8502			A.Cameron@iqaluit.ca
Environmental Health Officer (EHO)	Wilfred Ntiamoah	867- 975.5772			wntiamoah@gov.nu.ca
Public Works Clerk	Sue Avery	867- 222.2971			S.Avery@iqaluit.ca
City Dispatch	-	867- 979.5650			
Emergency Services					
Qikiqtani General Hospital		867-975-8600			
Fire, Ambulance, Police		867-979-4422			
Iqaluit Fire Department		867-979-1111			
Fire Chief		867-979-4422			
Non-emergency Emergency Services Dispatch		867-979-5650			

Iqaluit Fire Department		867-979-1111			
Director of Emergency Services / Fire Chief	Monday – Friday Daytime	867-979-5653			
Deputy Director of Emergency Services / Fire Chief	Monday – Friday Daytime	867-979-5657			
Regulatory Agencies					
Spill Reporting		867-920-8130			
Nunavut Emergency Management Services	Emergency 24 hours	867-979-6262			
	Director of Nunavut Emergency Services	-867-975-5477			
City of Iqaluit Mayor	Solomon Awa	867-979-5600			
Premier of Nunavut	P.J. Akeeagok	867-975-5050			
Utilities					
Qulliq Energy Corporation (Electricity and Power)		867-222-3807			
Repair Services / Suppliers / Testing / Consultants					
Aquatic Life Ltd.	Jeff Simpson	204-753-5270			
Aquatic Life Ltd.	Steven Simpson	800-409-8378 ext 113			
WSP Canada Inc.	Justin Rak-Banville	204-259-1525			Justin.Rak.Banville@wsp.com
ALS Environmental Laboratories	Winnipeg	204-255-9720			
Caduceon Environmental Laboratories	Ottawa	613-526-0123			
Media					
Radio	CBC Radio One Iqaluit				
Television	CBC North				
Newspaper	Nunatsiaq News	867-979-5357			

APPENDIX – B

REPORTING FORMS

EMERGENCY RECORD ACTION FORM TEMPLATE

Part 1 – Description

Date record entered (yyyy/mm/dd) : _____ Time: _____
Recorded by: _____
Title/Position: _____
Description of incident:

_____
_____
_____

Location of Incident:

_____
_____
_____

Effect(s) of the incident observed:

_____
_____
_____

Has any contamination of the water occurred? Yes ( ), No ( )
Location of the affected water:
Raw water source ( ) Raw water Transmission ( ) Water Treatment ( )
Potable Water Storage ( ) Distribution System ( )

Part 2 – Action Taken

Immediate Action Taken:

_____
_____
_____

What assistance is already available?:

_____
_____

Personnel notified:

	WTP Lead Operator		Police
	Public Works Superintendent		Fire Department
	Chief Administrative Office		Hospital / Ambulance
	Public Works Clerk		Environmental Health Office

Other, specify:

POST-EMERGENCY REPORT TEMPLATE

Date (yyyy/mm/dd) : _____
Prepared by: _____
Title/Position: _____
Description of Emergency:

_____
_____
_____

Location of Incident:

_____
_____
_____

Effect(s) of the incident observed:

_____
_____
_____

Has any contamination of the water occurred? Yes ( ), No ( )
Location of the affected water:
Raw water source ( )Raw water Transmission ( )Water Treatment Plant ( )
Potable Water Storage ( )Distribution System ( )

Type of Emergency:
Type I - Routine ( ) Type II - Minor ( )
Type III – Significant ( ) Type IV – Catastrophic ( )

EMT members analyzing the emergency:

_____
_____
_____

Other personnel / agencies / contractors / consultants notified:

_____
_____
_____
_____

Action Plan Analysis

Action #1

Responsible Personnel: Date: Time:

Description:

_____

_____ _____
Analysis: (Was action effective? / Were resources available? / Was action safe?) _____ _____ _____
Action #2
Responsible Personnel: Date: Time:
Description: _____ _____ _____
Analysis: (Was action effective? / Were resources available? / Was action safe?) _____ _____ _____
Action #3
Responsible Personnel: Date: Time:
Description: _____ _____ _____
Analysis: (Was action effective? / Were resources available? / Was action safe?) _____ _____ _____
Action #4
Responsible Personnel: Date: Time:
Description: _____ _____ _____
Analysis: (Was action effective? / Were resources available? / Was action safe?) _____ _____ _____
Action #5
Responsible Personnel: Date: Time:

Description: _____ _____ _____
Analysis: (Was action effective? / Were resources available? / Was action safe?) _____ _____ _____
Lesson Learned
Lesson #1: _____ _____ _____
Lesson #2: _____ _____ _____
Lesson #3: _____ _____ _____
Supporting Information Attached
Signatures
Prepared by:
Reviewed by:
Emergency Coordinator:

APPENDIX -C

WATER CONTAMINATION INVESTIGATION

Consult the following documentation
Water Quality Monitoring using S:CAN Technology - WTP-SOP-002
Procedures for Contamination Investigation WTP-SOP-004

Testing agency is listed in contact list.

APPENDIX –D

"BOIL WATER ADVISORY" GUIDANCE

APPENDIX E

ADVISORY NOTICE TEMPLATES

City of Iqaluit

BOIL WATER ADVISORY

[DESCRIPTION OF REASON BEHIND BOIL WATER ADVISORY]

Due to the above concerns and as a precautionary measure, water users are advised to bring all water to a rolling boil for at least one minute and let it cool before using it or, use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth and food preparation until further notice. We will inform you when the Water Quality Advisory is removed.

THIS BOIL WATER NOTICE IS EFFECTIVE _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS ADVISORY: _____

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

BOIL WATER ADVISORY

[High Turbidity Levels]

High turbidity levels have been detected in the drinking water supply. High turbidity [cloudiness] levels may occur in surface water sources due to seasonal weather changes causing excessive surface runoff, flooding or lake turnover. A high turbidity level may impair the effectiveness of the disinfection treatment system. If disinfection is impaired, disease-causing microorganisms may escape into the water distribution system resulting in an increased risk of intestinal illness. People with undeveloped immune or severely weakened immune systems, infants and elderly may be at increased risk.

Due to the above concerns and as a precautionary measure, water users are advised to bring all water to a rolling boil for at least one minute and let it cool before using it or, use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth and food preparation until further notice. We will inform you when the Water Quality Advisory is removed.

THIS WATER QUALITY NOTICE IS EFFECTIVE _____UNTIL FURTHER NOTICE.

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

BOIL WATER ADVISORY

[Total Coliform Presence]

Laboratory tests indicate the presence of total coliform bacteria in the drinking water. The "total coliforms" may be due to inadequate disinfection treatment or distribution pipes that are in need of maintenance. Total coliform bacteria are naturally present in the environment and they are generally not harmful themselves but they indicate an increased chance that organisms causing intestinal illness may be present in the drinking water. People with undeveloped immune or severely weakened immune systems, infants and elderly may be at increased risk.

Due to the above concerns and as a precautionary measure, water users are advised to bring all water to a rolling boil for at least one minute and let it cool before using it or, use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth and food preparation until further notice. We will inform you when the Water Quality Advisory is removed.

THIS BOIL WATER NOTICE IS EFFECTIVE _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS ADVISORY: _____

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

BOIL WATER NOTICE

[Contaminated Water]

Contaminated water has entered the distribution system and we've received reports of people with symptoms typical of waterborne illness. Disease-causing organisms [bacteria, viruses or parasites] may have entered the distribution system. These organisms can cause symptoms such as diarrhea, abdominal cramps, headaches, nausea, vomiting or other symptoms. Boiling the water kills these organisms. People with weakened or undeveloped immune systems are most at risk [this includes elderly people, pregnant women and their unborn, very young children [under 2], people with AIDS, cancer, diabetes or kidney disease and people being treated with immuno-suppressing medications].

Water users are advised to bring all water to a rolling boil for at least one minute and let it cool before using it or, use bottled water. Boiled or bottled water should be used for drinking, making ice, washing dishes, brushing teeth and food preparation until further notice. We will inform you when you no longer need to boil your water.

THIS BOIL WATER NOTICE IS EFFECTIVE _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS ADVISORY: _____

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

DO NOT CONSUME WATER NOTICE

We have recently discovered that an unknown quantity of a chemical contaminant may have entered the water supply system. Water samples are being collected to determine if the water quality meets the standards of the *Guidelines for Canadian Drinking Water Quality.* The chemical contaminant may be at a level that makes our water supply toxic and unfit for drinking or bathing.

As a precautionary measure to avoid health risks, we are advising water users to use bottled water or an alternate source of water for drinking, making ice, washing dishes, brushing teeth, bathing and food preparation until further notice. ***BOILING THE WATER WILL NOT MAKE IT SAFE***. If alternate water sources are used, the water must be from an approved source only. The water in your hot water tank may also be unsafe. Please consult a qualified plumber before draining you hot water tank.

THIS DO NOT CONSUME WATER IS EFFECTIVE _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS NOTICE: _____

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

NOTICE

VOLUNTARY WATER CONSERVATION

As a result of the recent incident involving _____, there is a strong possibility that pumping systems will have to be shut down. All water users are requested to reduce water consumption immediately and to be prepared for a temporary water shortage. It is recommended that you store a small quantity of water for consumption and general household use. As an extra precaution, you may want to disinfect this emergency water supply by adding household chlorine bleach [two drops of bleach to 1 litre of water or 0.5mL bleach to 1 Imperial Gallon/4.55 litre of water] Please ensure that only clean potable water containers are used for storing these emergency supplies.

THIS VOLUNTARY WATER CONSERVATION NOTICE EFFECTIVE _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS NOTICE: _____

THANK YOU FOR YOUR PATIENCE AND CO-OPERATION

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

NOTICE

MANDATORY WATER CONSERVATION

As a result of the recent incident involving _____, the main pumping system is not in operation – there is no water entering the distribution system. Please refrain from using faucets and other plumbing fixtures and please use stored water, bottled water or an alternate source of water for domestic purposes. Draining your hot water tank is not recommended unless you have consulted a qualified plumber. If alternate water sources are used, the water must be from approved sources only.

THIS MANDATORY WATER CONSERVATION NOTICE EFFECTIVE _____ _____UNTIL FURTHER NOTICE.

AREAS IMPACTED BY THIS NOTICE: _____

THANK YOU FOR YOUR PATIENCE AND CO-OPERATION

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

NOTICE

WATER SYSTEM RECOVERING

The water supply system has been inspected and, where necessary, repairs have been made. All pumping systems are now fully operational. While the system is recovering to normal operating levels, your assistance with conservative water use over the next two or three days would be appreciated. If you have received a *Boil Water Notice* or a *Water Quality Advisory*, please continue to take the necessary precautions until you've seen the *Drinking Water Problem Corrected* notice.

EFFECTIVE _____

THANK YOU FOR YOUR PATIENCE AND CO-OPERATION

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

NOTICE

DRINKING WATER ISSUE CORRECTED

Water samples collected from our water system indicate that **it is no longer necessary to boil water prior to consumption**. Chlorine levels will be increased for a short period of time and you may detect a stronger chlorine taste and odor. Chlorine levels will be reduced to normal operating range as soon as possible.

EFFECTIVE _____

THANK YOU FOR YOUR PATIENCE AND CO-OPERATION

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

City of Iqaluit

NOTICE

DRINKING WATER ISSUE CORRECTED

The *Do Not Use Water Notice* is Removed

Water samples collected from our water system indicate that **it is no longer necessary to use bottled water or other alternate sources of drinking water**. We may find it necessary to increase chlorine levels for a short period of time and you may detect a stronger chlorine taste and odor. Chlorine levels will be reduced to normal operating range as soon as possible.

EFFECTIVE _____

THANK YOU FOR YOUR PATIENCE AND CO-OPERATION

ENQUIRIES?

Please call _____, Communications and Customer Service Manager, City of Iqaluit at 867-222-8502

PLEASE SPREAD THE WORD TO YOUR NEIGHBOURS

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly [for example: people in apartments, rental units, nursing homes, schools, preschools, churches and businesses]. You can do this by posting this notice in a public place or distributing copies by hand or mail.

Signature:

_____

Communications and Customer Service Manager

APPENDIX F

ADVISORY NOTICES