Government of the
Northwest Territories

REPORT ON DRINKING WATER

2016

Government of
Northwest Territories

Government of the Northwest Territories (GNWT) Report on Drinking Water - 2016

Prepared by Department of Municipal and Community Affairs (MACA),
Government of the Northwest Territories

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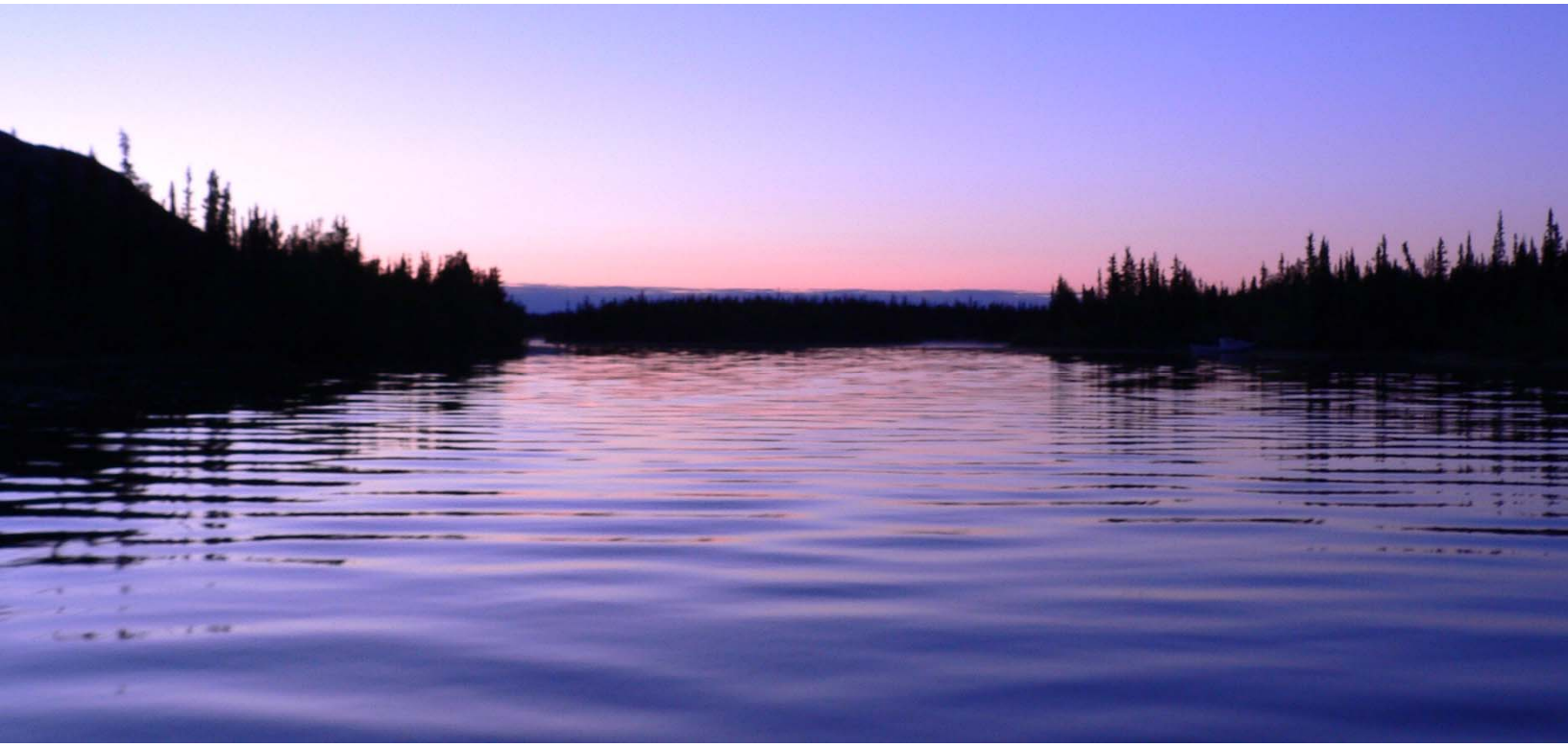


Executive Summary

Drinking water is an important issue for Northwest Territories (NWT) residents, and the Government of the Northwest Territories (GNWT) provides information to the public on all measures taken to support and protect clean water in the NWT. This report is intended to provide residents with information so that they can be confident in the safety of the water they drink every day. For more detailed information on NWT drinking water, visit our new website at http://www.nwtdrinkingwater.ca. If you have any questions or concerns about your community's drinking water, contact your community government.

In 2010, the GNWT Department of Environment and Natural Resources (ENR) released *Northern Voices, Northern Waters: The NWT Water Stewardship Strategy.* The initial Action Plan for implementation of the strategy ran from 2011-2015, and ENR has now developed a new Action Plan for 2016-2020. Key elements of the plan include:

- Source Water Protection and Mapping,
- Community-Based Water Monitoring,
- Research and Partnerships,
- Information and Data Sharing, and
- Youth and Public Education Outreach.

Through the multi-barrier approach of Source Water Protection, Water Treatment, and Monitoring and Testing, NWT operators work together with all levels of government to deliver safe drinking water. The operators' contributions are highlighted in an overview of the Sambaa K'e water treatment plant and its operator, Terry Crothers, as well as an interview with Enos Elton, the operator of the Fort Good Hope water plant.

Following recent water plant upgrades, the Circuit Rider program operated by GNWT Department of Municipal and Community Affairs (MACA) has been instrumental in helping operators upgrade their skills and certifications to meet the demands of their new plants. Recent improvements to remote monitoring systems and water sample data tracking are helping the GNWT to better assist operators with operations and troubleshooting. Water plant upgrades will continue during 2017, as the last three chlorination-only truckfills in the NWT are replaced in order to meet the filtration requirements of the current Guidelines for Canadian Drinking Water Quality. This project is expected to be completed in 2019.

Roles & Responsibilities

Providing safe drinking water in the NWT takes a coordinated approach by both the GNWT and the community governments. The 2005 Framework for Providing Safe Drinking Water outlined the multi-barrier approach to safe drinking water. Utilizing four government departments, the GNWT ensures fresh safe drinking water to its residents through a three tiered system.

Keeping Water Clean

All levels of government recognize the need to make the protection of source water a priority. This is achieved by selecting the purest sources of water and protecting these sources from contamination. The GNWT has primary responsibility for source water management and GNWT departments are involved in several partnerships that undertake initiatives to promote the protection of source water.

ENR contributes to keeping water clean through supporting community source water protection initiatives and community-based aquatic ecosystem monitoring, collecting information about water quantity and quality in the NWT in cooperation with federal and territorial departments, providing information and expert advice to regulatory boards, and ensuring water licensing requirements are met.

Making Drinking Water Safe

Drinking water treatment and delivery is assisted at the community government level by the Department of Infrastructure (INF) and Municipal and Community Affairs (MACA). Construction of water treatment facilities are planned and managed in part by both INF and MACA from a technical review and project management aspect. INF also provides maintenance assistance both on site and in developing and performing routine maintenance. MACA plays a role in the operation of the water treatment system through onsite training with the circuit rider program, visiting the communities and helping train the operators in their own plant. Also, the School of Community Government (SCG) within MACA administers the certification courses which are run through the Association of Board of Certification (ABC). From a project management and funding perspective, MACA works with INF and the federal government in accessing funding options for water plant upgrades and managing the projects for the communities.

Proving Drinking Water is Safe

The Department of Health and Social Services (HSS) is the regulatory agency that enforces the *NWT Public Health Act*. Each community has an assigned Environmental Health Officer (EHO) who works with them in order to ensure that the water is safe and the regulatory requirements are being met. The EHO travels to each community to perform a physical inspection of the water plant semi-annually, as well as to provide advice to operators on annual chemical sampling and, at times, assist with the annual chemical samples. It is the enforcement of the *NWT Public Health Act* that will guide the EHO in their work with the community governments when enforcing regulations, or, if necessary, issuing boil water advisories.

The roles of the GNWT departments are diverse and cover all facets of providing safe drinking water; however, this would not be possible without the work being done at the ground level in the communities. The community government operates and maintains their water plant with the help of the GNWT. The responsibility of the Senior Administrative Officer (SAO) is to ensure certification and to supervise the operator. The roles of the operator are to ensure that the water is treated and disinfected. Lastly, the role of the truck driver is to deliver water to the people of the community.

NWT Water Stewardship Strategy

Northern Voices, Northern Waters: The NWT Water Stewardship Strategy (the Water Strategy) is a made-in-the-North Strategy developed to guide long-term stewardship of our water resources. The Water Strategy was released in 2010 in response to Northerners' concerns about their water. In May 2011, the first Action Plan *(NWT Water Stewardship: A Plan for Action 2011-2015)* was developed to guide the implementation of the Strategy.

An independent evaluation of the 2011-2015 implementation phase was conducted in 2015. The evaluation underscored the success of several important initiatives and suggested improvements for water partners to work together more effectively to meet the goals of the Strategy. The outcomes of the independent evaluation directly informed the development of a new Action Plan for 2016-2020 *(NWT Water Stewardship Strategy: A Plan for Action 2016-2020).*

The 2016-2020 Action Plan builds on the momentum of the 2011-2015 implementation phase. It continues to put into motion the vision of the Water Strategy. The plan identifies lead and supporting water partners and keys to success with associated action items and deliverable dates.

The 2016-2020 Action Plan also reflects the significant policy changes stemming from the NWT Devolution Agreement, which came into effect on April 1, 2014. Under this Agreement, responsibilities related to water and land management in the NWT were transferred from Indigenous and Northern Affairs Canada (INAC) to the GNWT. Accordingly, the GNWT Department of Environment and Natural Resources (ENR) is now solely responsible for coordinating implementation of the Water Strategy.

There are a number of keys to success and action items identified in the 2016-2020 Action Plan that work towards ensuring NWT residents have access to safe, clean and plentiful drinking water. Prominent activities currently underway include:

- Source water protection and mapping;
- Community-based water monitoring, research and partnerships;
- Information and data sharing; and,
- Youth and public education outreach.

Source Water Protection and Mapping

ENR supports communities to help identify and develop plans to protect local water values that may be at risk from activities on the land. These initiatives are broadly described as "source water protection" – a planning and management program to protect the quality of water that supplies community drinking water systems. Source water protection planning is intended to reduce the risk of drinking water contamination by being the first of multiple barriers to ensure safe drinking water.

The 2016-2020 Action Plan identifies source water protection planning as a key to success. ENR worked with source water protection planning experts at the University of Saskatchewan and the Institute for Watershed Science and Indigenous Environmental Studies Department of Trent University to develop a Source Water Assessment and Protection Guidance Document. The document is a tool that NWT communities can use to navigate the development of their own source water protection plans. The guidance document and associated workbook are available on the NWT Water Stewardship Website: http://www.nwtwaterstewardship.ca/?q=swprotection.

ENR has also created community catchment maps to help support source water protection planning initiatives in communities. These maps are currently available for each NWT community at: http://www.geomatics.gov.nt.ca/maps.aspx?i=8.

In 2014, ENR partnered with the Sambaa K'e Dene Band (SKDB) and Ecology North to pilot these resources for the first time. The guidance document and community catchment maps were used and adapted throughout the source water protection planning process, resulting in a source water protection plan tailored to community needs and values. Work is ongoing in Sambaa K'e to continue implementing the plan.

For more information about source water protection planning, please contact the Water Resources Division of ENR at nwtwaterstrategy@gov.nt.ca.

Community-based Water Monitoring, Research and Partnerships

During the development of the Water Strategy, communities and water partners highlighted the need for water research and monitoring to improve our collective understanding of aquatic ecosystem health, including water quality. The 2016-2020 Action Plan continues to recognize the importance of supporting NWT communities to become more involved in water research and monitoring and to develop initiatives that address community questions. Strong community involvement and the development of partnerships are foundational for this research and monitoring. Partnerships foster a wide range of innovations, including increased awareness of water stewardship issues, increased local capacity and technical skills, improved traditional knowledge collection and application, as well as increased direct community involvement in research and monitoring program design.

Several community-based monitoring and research initiatives are being implemented under the 2016-2020 Action Plan. For example, the Slave River and Delta Partnership (SRDP) was formed in 2010 to coordinate and maximize community-based monitoring efforts along the Slave River and Delta. The partnership is continuing work towards this goal and includes members of community, territorial, federal and Aboriginal groups and governments, environmental non-governmental organizations and academia.

The NWT-wide Community-based Water Quality Monitoring (CBM) Program was launched in 2012 with the goals of providing opportunities for NWT residents to participate in water monitoring in an effort to build community capacity and to help answer community questions about water quality. The program had its fifth year of water quality monitoring in 2016 and continues to involve community members from more than 20 communities in the NWT, regional partners (e.g. Dehcho AAROM), ENR staff and other water partners. Monitoring is done at approximately 40 sites across the NWT. Data from the program can be accessed online from Mackenzie DataStream http://mackenziedatastream.ca. For more information and publications related to the NWT-wide Community-based Water Quality Monitoring Program, please visit http://www.nwtwaterstewardship.ca/communitymonitoring.

Tracking Change is a six-year project led by the University of Alberta, in partnership with the Traditional Knowledge Steering Committee of the Mackenzie River Basin Board, ENR and many other partner organizations. The project is aimed at demonstrating the importance of local and traditional knowledge in the governance of major fresh water ecosystems and strengthening the voices of subsistence fishers and Indigenous communities in watershed governance. The main focus is to promote community-driven local and traditional knowledge research activities in the Mackenzie River Basin, where people have been tracking change in water and fish for time immemorial.

Global Water Futures is a large research project led by University of Saskatchewan in partnership with Wilfrid Laurier University, University of Waterloo and McMaster University with more than 140 national and international partners, including ENR. The aim is to improve the way communities, governments and industries in Canada and other cold regions prepare for and manage increasing water-related threats such as declining source water quality, floods, droughts and algal blooms.

For more information about these and other community-based monitoring, research and partnerships, please contact the Water Resources Division of ENR at nwtwaterstrategy@gov.nt.ca.

Information and Data Sharing

Water stewardship activities and decision-making must be supported by adequate, accurate, current and accessible data and information. Information management, specifically with regards to improving water data collection, management, and sharing, is an important key to success under the 2016-2020 Action Plan.

In collaboration with ENR, the Gordon Foundation recently launched Mackenzie DataStream - an online open access platform for sharing information about freshwater in the Mackenzie River Basin http://mackenziedatastream.ca. DataStream's mission is to promote knowledge sharing and advance collaborative, evidence-based decision making.

ENR also compiled the NWT Water Monitoring Inventory, which provides information on current water monitoring programs led by Aboriginal, federal and territorial governments, communities, industry and others in the NWT. The inventory is intended to help water partners and the public find information about the state of the water resources in their region.

ENR also strives to share water stewardship information, including results from water quality monitoring and research, through different communication formats to reach a broad and diverse audience. These formats have included electronic mail-outs, regional meetings, workshops, themed calendars, teleconferences, brochures, posters, presentations, online databases and audio translation files.

All of these resources can be accessed through the NWT Water Stewardship Website: http://www.nwtwaterstewardship.ca/?q=monitoring_research_tools. The website is another important information sharing tool to update water partners and the public on progress towards implementing the Water Strategy.

Youth and Public Education and Outreach

Encouraging young people to be involved in water stewardship was identified by water partners, including communities, as an important part of the Water Strategy. Building awareness and capacity among youth on water and stewardship creates informed leaders and decision-makers of tomorrow. Although public engagement and youth outreach are often components that are built into broader water stewardship implementation activities, there are also specific education and outreach initiatives included in the *2016-2020 Action Plan*.

Rivers to Oceans Day is an annual youth water education event held in Yellowknife, in collaboration with various water partners, including ENR. The purpose of the event is to engage youth in various water stewardship topics and promote awareness about water resources. Past station topics have included water contamination, drinking water treatment and water quality sampling.

ENR also provides support to bring annual Canada Water Week celebrations to the NWT. Canada Water Week is a national celebration of water that encourages individuals, organizations and governments across Canada to host or participate in educational water-related events. Past activities in the NWT have included water-themed speaker events, community water treatment plant tours, development of a source water education curriculum and hands-on water quality classroom sessions.

In collaboration with water partners, ENR has also hosted shoreline cleanup events in support of the Great Canadian Shoreline Cleanup. The cleanups provide opportunities to educate, empower, and engage people in shoreline litter issues and the associated impacts on water quality and habitats.

ENR also has trained staff to deliver the Stream of Dreams mural program in NWT schools. The program takes educators into the classroom to teach youth about the importance of water, threats to water and actions we can take to protect water bodies in our community.

For more information on youth public education and outreach, please contact the Water Resources Division of ENR at nwtwaterstrategy@gov.nt.ca .

Effective Monitoring of Drinking Water in the NWT

Safe drinking water in the NWT is important to all residents, governments, communities and regulators. One action necessary to ensure safe drinking water is the timely review of test results for monthly bacteria tests, annual chemical tests or for the multiple chlorine and turbidity (suspended particles in the water) tests required daily by water treatment plants.

Routine testing and reporting of test results to the Office of the Chief Public Health Officer is required under the Public Health Act. The Environmental Health Unit reviews all test results as soon as these are received to ensure drinking water quality meets safety standards. If there are any safety concerns, corrective actions are taken immediately with the water treatment operators. If microbiological safety cannot be assured, boil water advisories are immediately put in place and the public is notified. Boil water advisories are removed only when the Chief Public Health Officer is assured that drinking water quality meets safety standards.

Public reporting of community test results has mostly been done through posting of information to the NWT Drinking Water website. However, this old database is unable to provide reports to neither assist Environmental Health Officers in monitoring and reviewing community performance or trends, nor can it provide more useful reports to residents and community governments about the frequency of testing and water quality results for their drinking water systems.

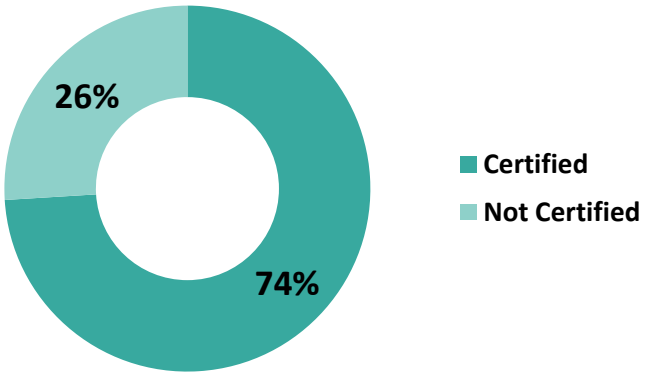
A new database has been developed to capture test results for bacteria, chlorine levels and turbidity levels. Community-specific reports will be created to present results for this calendar year (ie., data since January 2017). These new reports will provide information to water treatment operators and community governments. Reports will be posted on the NWT Drinking Water website twice per year, with the first reports to be posted in 2018 to reflect testing in the first half of the calendar year. Annual chemical test results will also be posted. Work to update the chemical sample database is ongoing.

If you have questions about your drinking water safety, first contact your community government. Should you not be able to get information from the community government, contact the Environmental Health Unit at environmental_health@gov.nt.ca or (867)767 9066 Ext 49262.

Operator Certification

In the NWT water treatment operators have mandatory certification to the level of their treatment plant. Certification is achieved through a combination of work experience and passing a test rated to the level of plant they are operating. The certifying body recognized throughout Canada is the Association of Boards of Certification (ABC). Courses in water treatment plant operation are administered through the School of Community Government and are held multiple times throughout the year and can be offered in different regions to allow for greater attendance. MACA offers courses up to the class two levels, as a result the few municipalities that have a class 3 plant are required to attend the course in Alberta and their certification through ABC can be transferred back to the NWT. In the NWT it is also possible for the operators to gain restricted certification to their water plant through a combination of course time and work experience. The construction of new water treatment plants can change the classification of the water plant; currently half of the non-certified operators working in the north have been through an infrastructure upgrade and are working towards advancement to their level of plant.

For any information on courses, material or certification numbers, contact the MACA School of Community Government at (867)767-9163 ext. 21057



GNWT Circuit Rider Program

The MACA Circuit Rider Program provides on-site instruction for water treatment plant operators. Beginning in 2004, the program has been instrumental in helping local water treatment plant operators gain certification as well as operate their water plant in an efficient and safe manner. With new technologies being developed and water treatment plants being upgraded, the Circuit Rider Program helps to bring the new operators up to speed, as well as helping the current operator learn all the new processes involved with their new facility. In addition, the *Water Supply System Regulations* enacted in September 2009 made certification mandatory for water treatment plant operators. For these reasons, and because of high operator turnover, an increased emphasis on training and certification is needed and the Circuit Rider Program assists communities to address these requirements.

Due to new federal guidelines on water filtration, in the past decade, 10 new water treatment plants have been built and are currently being operated, and construction of three more plants is slated to be started within the next few years. As a result, there are many operators that have seen changes in both their plant classification and complexity. Having hands on training while learning how to operate a new facility increases the operator's confidence as well as providing a second set of eyes and ears on the ground for trouble shooting and maintenance.

The certification process in the NWT requires that the operator pass a test based on the classification of their water system as well as having plant experience. The Circuit Rider program can be a good way to inspire confidence in the drinking water from the community and to help boost the operator's confidence while helping them achieve certification.

As well as performing routine maintenance and training, the circuit rider assigned to each community can also help during emergency situations or provide classroom help to prepare the operators in advance of the certification course. The MACA School of Community Government provides courses annually for the different levels of certification, and will often work in conjunction with the circuit rider to identify the best candidate to take the course and help prepare them beforehand in order to maximize the probability of success in the course and to receive certification.

Water Treatment Plant Spotlight- Sambaa K'e

Sambaa K'e is a town of approximately 150 people that resides in the southwest corner of the NWT. The water source is Trout Lake, a large body of water that is relatively deep and cold throughout the year. Although the water has relatively low turbidity it is known to have high color due to the lush environment in which it is situated, as well as the high water table. Prior to 2014 the community relied on a small system water treatment plant with an above ground seasonal fill reservoir that allowed some of the solids to settle out, but changes to the Guidelines for Canadian Drinking Water Quality made filtration mandatory. Using funding from the Build Canada funding program, the GNWT, PW&S, MACA and the Sambaa K'e Band entered in to an agreement to build a new water treatment plant using a bundled approach partnering with the communities of Lutselk'e, Fort Good Hope, Jean Marie River and Wrigley to reduce costs.

The new facility is a Class 1 plant consisting of coagulant-assisted membrane filtration. Water is pumped from the seasonal fill reservoir into a coagulant tank inside the building where inline flash mixers help the coagulant mix into the water and bind to the organic particles. After coagulation, the water is pumped into the membrane tank where negative air pressure creates a vacuum to pull the water through the microfiltration membrane tubes at a rate of 104 liters per minute. The coagulated organics and turbidity are caught on the outside of the membranes. Once filtered, the water is disinfected with liquid chlorine and pumped into a chlorine contact chamber where it retained long enough to for disinfection to take place. Once filtered and disinfected, the water is stored in the equalization tank until it is delivered to the local residents.

The water treatment plant is maintained by local operator Terry Crothers, who oversees the day to day functions within the plant including all the regulatory sampling and maintenance logs. In order for the plant to work at its optimum capacity, regular calibration of the inline metering equipment is needed, along with routine maintenance on the plant itself. Some of the maintenance items include repairing membrane fibers and performing a quarterly Clean in Place on the filter membranes. Once per day, the plant performs a membrane integrity test by shutting off the water flow to the plant and filing the membranes full of air in order to check for leaks. In the event of a compromised filter, the plant will fail its membrane integrity test and an alarm will let the operator know that a repair is needed, if this happens the affected membrane cassette must be removed and tested again with pressurized air to detect the leak and then repaired with a UV activated epoxy.

The clean in place procedure is performed quarterly and consists of a two-part chemical bath which cleans the membranes to preserve the life of the plant, as well as keep the optimal flow rate. Due to the size of the pores in the membranes, buildup on the fibers is common and needs to be removed regularly. The first step to cleaning the membranes is a high-concentration hypochlorite bath, where a large dose of chlorine is added to the membranes in order to kill off any microorganisms, algae or bacteria that is built up on the surface of the membranes; this process takes 12 hours of soaking time. Once diluted back to safe levels, the water is drained, and the membranes are rinsed in preparation for the acid wash. Citric acid is added to the tanks in order to lower the pH inside the membrane chamber to 2. This removes any fouling and scale buildup during another twelve hour soak. The water is then neutralized back to 7 using sodium hydroxide, and then drained. The membranes are rinsed once again; the plant is then ready to be brought back online.

NWT facilities such as this one are a shining example of how all levels of government, including the community governments can work together to provide clean, safe drinking water in the smaller northern Communities while complying with changing federal guidelines.

Keep up the good work Terry and the Sambaa K'e water treatment plant!

Operator Appreciation: Enos Elton, Fort Good Hope

The community of Fort Good Hope lies on the banks of the Mackenzie River in the Sahtu region of the Northwest Territories. The community gets their water from the Mackenzie River through a seasonal fill reservoir to allow turbidity to settle and it is then pumped into a class 1 coagulant assisted membrane facility that was built in 2015. Prior to the new plant, the community used a small system truck fill station with chlorine disinfection. For the past 23 years Enos Elton has operated the plant all the while conducting the duties of the community works foreman. In 2017 he stepped aside for Paul T'seleie to take over as the full time operator so Enos can focus on his duties as foreman until he retires. He will also act as backup operator to Paul and mentor him while he is learning the new plant.

When did you start working at the WTP?

I started back in 1994

What drew you to being the WTP operator?

PWS (now INF) used to run the water plant until the community took over its operations. When we switched I was the only one available, so it took the job. Throughout the years other people have worked here but I always ended up back running the water plant even though I was the foreman

What level of certification did you receive?

Small System and restricted certification for the Class 1 system after the upgrade was completed.

What were some of the main challenges you faced as being the foreman and water treatment plant operator?

The main problem has been encountering issues with the water plant and not having local capacity to fix it, waiting for help from out of town, when people aren't available can take longer than if we had more workers around here. Also, getting parts can be an issue, the new plant had its challenges with the computer system and some parts that failed but it's all worked out now.

What was your favorite part of the job?

I just really enjoy doing this job learning new things on a regular basis. Looking after the community's water is rewarding knowing you are providing nice clean water to the town.

What was your least favorite part of the job?

I actually liked all parts of the job there are other duties as foreman of the community that are not as fun but the water plant has always been the good part of it.

What is your plan for the future?

I will keep working as the foreman for a few more years, and help Paul out with the water plant. Then when I finally decide to retire from working altogether I will enjoy time at my cabin up the river and at home with my family.

What do you like about the new plant as compared to the old one?

The new plant is so much nicer with these filters. The old plant had no filters so the water would get worse around the reservoir fill-up and when it rained hard. And it's nice and clean.

What will you miss most about operating the water treatment plant?

I am sure I will still spend enough time helping Paul out that I won't miss it much.

Have you enjoyed mentoring younger staff?

Yeah they are really good, they are young and have way more energy than me and Paul is good with computers so it has made using the new plant a lot easier.

What is one piece of advice you could give to other operators just starting out?

Take your training and stick to it. The test is hard but if you do the course and work hard anyone can pass it. Once you get your certificate for the wall, make sure you have patience especially with the new water plants. They have things that can go wrong out of nowhere.

The MACA water and sanitation section would like to extend a huge thank you to Enos for all his years of hard work and dedication!

Remote Monitoring of Water Treatment Plants

The NWT has 33 communities and 30 water treatment plants (WTP). These WTP have varying technologies, including truckfill stations, membrane systems, conventional chemically-assisted filtration, pristine water dual disinfection, direct media filtration, greensand filters, and water softeners. MACA support and Environmental Health Officer (EHO) enforcement of the regulations are challenged by the vast distances and limited access to NWT communities. Therefore, it was determined long ago that some form of remote monitoring was needed to ensure that NWT residents receive the very best drinking water.

Initially, the only form of remote monitoring was the weekly log sheet that was faxed to the EHO. WTP operators would perform daily chlorine and turbidity tests and record them on a log sheet that was faxed to the EHO for review. This is still done, and gives EHO's valuable information on how a WTP is operating, but the data can be up to a week old.

In the mid-2000's the GNWT started a pilot program to install inline turbidity and chlorine meters in various communities. Live data was transmitted to and recorded on a device called a Sensaphone. Data on the Sensaphone could be downloaded locally or via a dial-up modem. Regular data downloads were required as the Sensaphone had a limited memory. Additionally, poor-quality phone lines made dial-up connections challenging at best. However, the system could be used to get up-to-date information from a specific WTP and paved the way for future remote monitoring systems.

Newer WTP installations came with inline meters and Programmable Logic Controllers. These devices logged the various parameters measured and had significant memory storage. Dial-up access was also provided, which allowed remote download. The dial-up access still had its limitations. Often, several attempts would be required to establish a connection and the connection would often be lost during download.

The next wave of remote monitoring is now coming as NWT communities get increased access to broadband internet and 3G cellular service, which can be used for an internet connection. This allows for continuous online monitoring of parameters. MACA's Water and Sanitation staff have been installing a system called DeviceLynk in select NWT WTP's. The DeviceLynk system passively reads "tags" from the PLC, stores the data, and then transmits it over the internet. This data can then be viewed remotely and combined with data from various other systems. MACA staff can then view this data on their computers and easily provide live support to operators in remote communities. About one third of NWT communities have these systems installed with more planned for the future.

Outlook for 2017

- First published in 2004 by PWS, Good Engineering Practice for Northern Water and Sewer Systems (GEP) has been an invaluable tool for designers of northern infrastructure. The water and sanitation section of PWS has since moved to MACA. MACA is now in the process of updating the GEP to take into account new technologies, lessons learned, and recent northern research. The second edition is expected to be published in 2017.

- The remote monitoring program will see an increase in 2017. New devices will be installed in more of our water plants giving a better view of the day to day operations within the plant to assist with regulatory requirements and maintenance planning.

- The MACA Circuit Rider Program will continue to work with identified communities to help operate and maintain their water treatment infrastructure, as well as to help the operators work towards achieving certification to the level of their water treatment plant.

- Data tracking and regulatory reporting compliance is currently being updated by HSS with the new system, expected to be rolled out in 2018, giving a more accurate view of the regulatory compliance obligations being completed at the community level.

- The Government of Canada and the GNWT will take on joint funding of projects through the building Canada Plan's Small Communities Fund. The funding Program will support key infrastructure initiatives throughout the north, including upgrades to drinking water facilities, road improvements and recreational facilities. Through this program the communities of Paulatuk, Gamètì and Wekweètì will have new treatment plants built. Also studies and upgrades to current facilities will happen in the communities of Inuvik and Whatì. For more information on the small communities fund in the NWT visit: http://www.maca.gov.nt.ca/small-communities-fund/

2016 Water Quality Summary - Table

Community	Plant Classification	Water Source	Water Treatment Process	Certified Operator	Treated Water Bacteria Tests (% of compliance, 48 required, 228 for Yellowknife)		Treated Water Chemical Tests (1 required)	
					2016	2015	2016	2015
Aklavik	Class II	Mackenzie River (Peel Channel)	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	100%	×	✓
Colville Lake	Small System	Colville Lake	Cartridge Filtration, Chlorination, Storage	×	*2%*	**13%*	✓	✓
Délı̨ne	Small System	Great Bear Lake	Cartridge Filtration, UV, Chlorination, Storage	×	100%	100%	✓	✓
Behchokǫ̀ (Edzo)	Class II	West Channel	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	56%	✓	✓
Behchokǫ̀ (Rae)	Class II	Marian Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	68%	✓	✓
Fort Good Hope	Class I	Mackenzie River	Membrane Filtration, Chlorination and Storage	×	65%	94%	✓	✓
Fort Liard	Class I	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	✓	100%	100%	✓	✓
Fort McPherson	Class II	Deep Water Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	75%	100%	×	✓
Fort Providence	Class II	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	100%	✓	✓
Fort Resolution	Class II	Great Slave Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	65%	75%	✓	✓
Fort Simpson	Class II	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	100%	✓	✓
Fort Smith	Class III	Slave River	Upflow Clarifier, Filtration, Chlorination, Fluoridation, Storage	×	100%	23%	✓	✓
Gamètì	Small System	Rae Lake	Chlorination	✓	83%	38%	✓	✓
Hay River	Class II	Great Slave Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	100%	✓	✓
Inuvik	Class III	Mackenzie River	Coagulation, Membrane Filtration , Chlorination, Fluoride, Storage	✓	100%	100%	✓	✓
Jean Marie River	Class I	Mackenzie River	Membrane Filtration, Chlorination, and Storage	✓	92%	96%	✓	×
Łutselk'e	Class I	Great Slave Lake	Membrane Filtration, Chlorination and Storage	✓	100%	100%	✓	✓
Nahanni Butte	Class I	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	✓	100%	100%	✓	✓
Norman Wells	Class II	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	100%	100%	✓	✓
Paulatuk	Small System	New Water Lake	Chlorination	×	77%	100%	✓	×
Sachs Harbour	Small System	DOT Lake	Cartridge Filtration, Chlorination	×	31%	65%	×	✓
Sambaa K'e	Class I	Trout Lake	Membrane filtration, Chlorination and Storage	×	67%	73%	✓	✓
Tsiigehtchic	Class I	Tso Lake	Nano-Filtration, Chlorination and Storage	×	100%	100%	×	✓
Tuktoyaktuk	Class I	Kudlak Lake	Pressure Filtration, UV, Chlorination and Storage	×	100%	100%	×	×
Tulita	Class I	Great Bear River	Micro-Filtration, Chlorination and Storage	✓	94%	100%	✓	✓
Ulukhaktok	Small System	RCAF Lake	Pre-Filter, UV, Chlorination and Storage	✓	100%	65%	✓	✓
Wekweètì	Small System	Snare Lake	Chlorination	✓	65%	44%	✓	✓
Whatì	Class I	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	✓	100%	100%	✓	✓
Wrigley	Class I	Mackenzie River	Membrane filtration, Chlorination and Storage	✓	100%	92%	✓	✓
Yellowknife	Class II	Yellowknife River	Membrane Filtration, Chlorination, Fluoridation, Storage	✓	100%	100%	✓	✓

**Boil Water Advisory*

Does not meet Requirements

Meets Requirements

HSS & MACA Staff works with communities that submit less than the required number of bacterial samples per year to improve monitoring and reporting of samples and results. Drinking water is monitored by other parameters to ensure safety of water distributed (Chlorine and Turbidity). Low sample submission does not indicate unsafe drinking water.