September 3, 2021

Report To: Travis Rob, P.Eng., Manager of Operations & Facilities

From: Craig Miller, P.Eng., Environmental Superintendent

**SUBJECT:** 2021 DWQMS Management Review

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On Wednesday, August 25th in the IFK Boardroom at 1:00 pm local time, the DWQMS Management Review took place for the period of June 1, 2020 through May 31, 2021. Attached are the minutes from the meeting, as well as the review package. Below are the highlights of the DWQMS Management Review.

1) There were four non-conformances identified in the Annual Inspection by the Ministry of Environment, Conservation and Parks (MECP). The WTP inspection score was 94.11%. The four non-conformances and their explanations are:

    a. Between March 4, 2020 at 20:12 through March 5, 2020 at 07:50, final effluent chlorine residual data and filter effluent turbidity data was not recorded in the SCADA system due to a UPS failure. This has been resolved with new, redundant UPS systems.

    b. Written notice of an adverse water quality incident was not provided to the Ministry within 24 hours of verbal notification. This has been resolved with training.

    c. Owners of sample points were not notified by the Town of their test results within 7 days of receiving the results back. This has been resolved and all owners have been notified.

    d. The Annual Report submitted to the MECP for 2019 did not include the one adverse test result or corrective action. The 2019 report has since been revised and resubmitted to the MECP, thereby resolving this incident.

2) There were six adverse water samples reported during the Management Review time period. One (1) was related to the Point Park Campground re-opening and was resolved via re-sampling. Three were related to construction activities and resolved with re-sampling and new main commissioning. Two (2) were related to distribution samples and were resolved with re-sampling.

3) Succession Planning. Former ORO Brad Webb retired at the end of 2020. Greg Wiedenhoeft successfully bid into the ORO bulletin. Paul LeMesurier and Jay Bruyere are the other staff at the Water Treatment Plant. Bryan Patterson, Joel

Nicolay and Erik Gustafson currently make up the Water Distribution team and there is one vacant bulletin in the Water Distribution team that is currently being advertised. There are currently no concerns with respect to staffing.

4) The DWQMS Operational Plan had an external audit in November 2020 by SAI Global. No non-conformances were identified.

5) The 2021 Internal Audit resulted in zero non-conformances.

6) The Town is currently in an appeal process with the MECP over the Municipal Drinking Water License issued in May 2021. The MECP added a condition that Media Filter Backwash have a Chlorine Residual of 0.02 mg/L. This condition is not currently attainable with the current process. The Town is currently in a mediation process with the MECP to resolve this issue and a resolution is expected by the end of 2021.

7) Several capital upgrades occurred in 2020, including reconstruction of Scott Street between Reid Ave and Colonization Rd. E, Colonization Rd. W between Armstrong Place and the Riverview Cemetery, replacement of 9 water distribution valves and replacement of 7 fire hydrants.

8) Three (3) customer complaints were identified in the Management Review. All complaints were investigated and resolved.

9) Staff suggestions included:

    a. WTP security and entry requirements
    b. Looping of Riverview Drive @ Keating Avenue or add hydrant at end of line for flushing.
    c. Looping of Third Street East to Fourth Street West
    d. Line remaining water mains going under CN tracks
    e. Clarify responsibility of water line servicing Minnie Avenue North from Williams Avenue.
    f. Review and update emergency procedures and plans for the WTP

The Covid-19 Pandemic has created challenges to training; however, training providers have adapted and training has resumed 2021.

The Water Treatment Plant and Water Distribution staff had an outstanding year in 2020-2021 and persevered through many challenges and changes due to the pandemic. The DWQMS Management Review identified areas that we can improve upon and I expect the 2021 - 2022 Management Review will reflect this continuous improvement.

Respectfully submitted,

Craig Miller, P.Eng.
Environmental Superintendent

**Town of Fort Frances**

**Fort Frances Drinking Water System**

**Management Review Meeting Minutes**

**Date: Wednesday August 25, 2021**

**Time:** 1:00 P.M.

**Location:** Fort Frances Memorial Sports Centre

**In Attendance:** Faisal Anwar, CAO, Craig Miller, Paul Lemesurier, Jay Bruyere, Greg Wiedenhoeft, Bryan Patterson, Eric Gustafson and Travis Rob.

Absent: Joel Nicolay

Part of the QMS Operational Plan requires that management shall review the QMS once every twelve (12) months to assess and ensure the continuing suitability, adequacy and effectiveness of the QMS. Element 20 – Management Review was discussed. Management Reviews shall be included in the internal audit schedule.

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Introduction:

Reference to Operational Plan – Element 20 Management Review

Period June 1, 2020 to May 31, 2021

The Environmental Superintendent red through Element 20 with the committee members and there were no concerns or changes that needed to be made.

**Item 1 – Incidents of regulatory non-compliance:**

Ministry of the Environment (MOE) Annual Inspection Report (2020/2021)
Date of Inspection: January 8, 2021
Non-compliance with regulatory requirements – Four (4)

Continuous monitoring equipment that was being utilized to fulfill O.Reg 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O.Reg 170/03 and/or was not recording the data with the prescribed format.

- Between the dates of March 4, 2020 through to March 5 2020 at 7:50, final effluent chloring residual data and filter effluent turbidity data was not recorded in the SCADA system due to UPS failure which has been resolved with new, redundant UPS systems.

All required written notices of adverse water quality incidents were not provided as per O.Reg 170/03 Section 16-7

- Written notice of an adverse water quality incident was not provided to the Ministry within the required 24 hours of verbal notification. We have provided training and this has been resolved.

All reporting requirements for lead sampling were not complied with as per schedule 15. Section 1-9 of O.Reg 170/03

- Owners of sample points were not notified by the Town of their test results in the mandated 7 days of receiving the results. We have resolved this item by notifying all owners.

The Annual Report did not contain the required information and/or was not prepared by February 28th of the following year.

- The annual report submitted to the MECP for 2019 did not include the one adverse test result or corrective action. The 2019 report has since been revised and resubmitted to the MECP, thereby resolving this incident.

2019 Annual Summary Report (Schedule22) O. Reg. 170/03
Regulatory requirement: No later than March 31, 2021
Reported to O & F Executive Committee and Council
Council Approval was received March 8, 2021
Date submitted to MECP – March 9, 2021
Non Compliance with Regulatory Requirements: None

2019 Annual Report – O. Reg. 170/03
Regulatory Requirement: Not later than February 28
Date submitted to MECP: February 24, 2021
Non Compliance with Regulatory Requirements: None

O. Reg 450/07: Charges for Industrial and Commercial Water Users
Regulatory Requirement: Not later than March 31, 2021
Date submitted to MECP: No submission required

O. Reg. 387/04: Water Taking and Reporting
Regulatory Requirement: Not later than March 31
Date submitted to MECP: February 27, 2021.

Non-compliance with Regulatory Requirements: Late submission

**Item 2 – Incidents of adverse drinking water tests:**

WTP:
No adverse treated water samples

Water Distribution System:
Six (6) adverse distribution system samples.

6/15/2020 – AWQI #150279 – Campground Opening
7/21/2020 – AWQI #150860 – Scott Street WM Commissioning
9/9/2020 – AWQI #151997 – Colonization Road Cut and Cap
9/14/2020 – AWQI #152058 – Colonization Road Cut and Cap
12/7/2020 – AWQI #153207 – Weekly Distribution Sample
3/22/2021 – AWQI #153752 – Weekly Distribution Sample

**Item 3 – Deviations from critical control-point limits and response actions:**

The QMS Team had undertaken a Risk Assessment Review of the risks and their critical control-point/response actions between March 2021 and June 2021.

No changes/additions/deletions were noted

Reference Element 7/8

Due this year for a risk assessment from scratch.

**Item 4 – The effectiveness of the risk assessment process:**

The Operators reviewed the Risk Assessment Process between March 2021 and April 2021. No changes/additions/deletions were noted.

Reviewed on a yearly basis in accordance with Element 7.

**Item 5 – Internal and third party audit results:**

**Internal Audit Results:**

Latest Internal Audit:
June 29 – July 29, 2021 – undertaken by Cody Vangel
No Corrective Actions were identified.
Opportunities for Improvement were brought forward.

**Previous Audits:**

June 18 to July 3, 2020 – undertaken by Adam Mitchell
No Corrective Actions were identified.

**External Audit Results:**
Latest External Audit:
12 Month Upgrade Surveillance Audit
Off site (November 16, 2020) – undertaken by SAI GLOBAL – Accreditation Program for Operating Authorities
No non-conformances were identified

**Previous Off-Site External Audit**
Re-Accreditation Systems Audit
On site ( November 20, 2019) – undertaken by SAI GLOBAL – Accreditation Program for Operating Authorities
One minor non-conformance was identified. Evidence of written endorsement by top management and owner. Resolved February 14, 2020

**Item 6 – Results of emergency response testing:**

Standard Operating Procedures identified in the Emergency Response Binder had been reviewed with the Water System Operators in March 2020

Emergency SOP's Reviewed:

1. Policy 4.24 – SOP No. 1 – for the Destruction (bombing/major fire) of Water Treatment Plant or Water Tower.

2. Policy 4.23 – SOP No. 2 – for Pandemic Situation – affecting the Water Treatment Plant Operators and Community.

3. Policy 4.15 – SOP No. 3 – for Water Main Breaks and Repairs.

4. Policy 4.8 – SOP No. 4 – for breakdown of equipment at the Water Treatment Plant.

5. Policy 4.4 – SOP No. 5 – for Raw Water Source Contamination

6. Policy 4.27 – SOP No. 6 – for Standby Generator – WTP (New)

**Item 7 – Operational Performance:**

**WTP:**
Actions and recommendation from MECP

As a result of the 2020/21 MECP Inspection – 4 non compliances were identified. These have been resolved and/or corrected.

To have a Harmful Algae Bloom Monitoring Plan in place by October 28, 20921 – we currently have a draft ready for review by the committee.

Personnel:

ORO Brad Webb retired December 31, 2020
Jeff St. Pierre of OCWA acted as Remote ORO from January 1 to March 31, 2021.
Greg Wiedenhoeft from WTP OIC to ORO upon Mr. Webb's retirement.
Paul LeMesurier acting as WTP OIC
Jay Bruyere moved to the Water Treatment Plant as OIT.

Maintenance issues:

No issues

Currently working with the Ministry and Legal Counsel to find some resolution to the new limit on chlorine residual on backwash and how we can comply.

**Distribution System:**
Actions and recommendations from MECP:
None

**Personnel**

Paul LeMesurier now full time at the WTP from Distribution
Jay Bruyere now full time at the WTP from Distribution
One vacant operator role in the Water/Wastewter Department

**Maintenance Issues:**

A total of 12 water main brakes/repairs and a total of 4 service breaks/repairs throughout the Town since the last Management Review.

Frozen Water services to report – 12 residences

9 Valve replacements and 1 valve removal for 2020.

1. VAL312 – Victoria Ave N at Sixth Street East
2. VAALO57 -Colonization road West at Flinders Place
3. VAL115 – Wright Avenue at Fourth Street West
4. VAL124 – First Street West at Wright Avenue
5. VAL384 – Scott Street at Crowe Avenue
6. VAL393 – Second Street at Crowe Avenue
7. VAL111 – Fifth Street West at Wright Avenue
8. VAL433 – Second Street at Frenette Avenue
9. VAL112 – Fifth Street West at Wright Avenue

Removed VAL113 – Wright Avenue at Fourth Street West

Some existing fire hydrants are obsolete and we have no parts in order to maintain them. 7 Fire Hydrants were replaced in 2020.

1. HYD213 – Armit Avenue North at CNR Tracks
2. HYD141 – Thompson Street at Keating Avenue
3. HYD127 – Midblock of Keating Avenue – 500 block
4. HYD110 – Third Street West at Keating Avenue
5. HYD286 – Midblock of Fifth Street East 1000 block
6. HYD276 – Midblock of Third Street East 900 block
7. HYD302 – Midblock of Williams Avenue 1000 block

**Item 8 – Raw water supply and drinking water quality trends:**

No changes in raw water supply and drinking water quality trends.

Regular seasonal water turnover of Rainy Lake.

**Item 9 – Follow up on action items from previous management review:**

- Lining the water mains under the CN tracks along Keating Avenue and Wright Avenue is set to be completed in September 2021.
- Review and clarify the new Ontario Water Main Distribution Procedure with the MECP and NWHU to ensure clear understanding has been completed.
- Standardize with one hydrant type and valve for the Town (still outstanding)
- Develop a hydrant maintenance program similar to the valve exercising program that is done annually (currently working on)

- Install Wi Fi at the Water Treatment Plant – completed
- Improve network speeds for uploading videos to the network and utilizing GIS – has been completed at the Water Treatment Plant but still waiting to be completed at the Public Works building.

**Item 10 – The status of management action items identified between reviews:**

No management action items were identified between reviews.

**Item 11 – Changes that could affect the Quality Management System (QMS)**

Internal/External Audit: No issues

Management Review: No issues.

Any new business development upstream of water intake could potentially contaminate raw water source or supply. No concerns at this time.

Information only:

Where to find – electronically: Revision updates – Last version – check electronic version (latest version) found in W:\QMS Operational Plan\...file name (June 18, 2021; Revision No. 14).

**Item 12 - Consumer Feedback:**

Customer complaints: Last period – 1 complaint – this period 3 complaints – 2 for chlorine and 1 for distribution.

Notes:

Typical root causes of complaints

1. Construction projects creating dead-end mains can cause stagnate and discoloured water issues.

2. Result of water main breaks

3. Maintenance – valve exercising and flushing

4. Strong smell/taste of chlorine

**Item 13 – The Resources needed to maintain the Quality Management System (QMS):**

Council's commitment to provide the following:

Personnel – No issues

Financial – No issues

**Item 14 – The results of infrastructure review:**

Six (6) year capital plan (In OP – Appendix 1) 2021 is the end of the six (6) year plant
On an annual basis
Proposed infrastructure upgrades are discussed and reviewed with operators.
Council reviews and approves.

**WTP:**

On a monthly basis the WTP Overall Responsible Operator generates a report outlining operational and maintenance activities. The report is circulated and reviewed by the Environmental and Facilities Superintendent, Manager of Operations and Facilities, the O & F Executive Committee and Council.

**Upgrades for this period:**

Installed two new soda ash pumps

High lift pump #4 rebuild

Replaced impeller motor on clarifier #2

Replaced lab bench analyzer

**Water Distribution System:**

On a monthly basis, Environmental and Facilities Superintendent generates a report outlining maintenance activities. The report is circulated and reviewed by the Manager of O & F and the O & F Executive Committee and Council.

**Upgrades during this period**:

Water main valve exercise program – 20% per year – Area 5

Hydrant flushing: Flushing annually

Fire hydrant replacements: 7 see section 7 for a detailed list

Water main isolation valve replacements: 9 – See Section 7 for detailed list

Main Replacement ( Construction Projects):

- Scott Street between Colonization Road East and Reid Avenue
- Colonization Road West between Armstrong Place and east end of Riverview Cemetery
- Erin Crescent

**Scheduled for 2021 Construction:**

Replacements/new installation of water mains and services along the following streets:

a) Armit Avenue between Scott Street and Church Street
b) King's Highway (Pit Road #1 to Pit Road #2)

**Item 15 – Operational plan currency, content and updates:**

Current revision date: June 18, 2021– Revision 14

Updates – since previous period

Audits – amended OP after the audit review

List CAR's and provide copies of Corrective Action Records – None.

Document Request Change (DRC) – document changes to Operational Plan as described above ( spelling, grammar, personnel change, etc.). A result of conducting staff meetings to review the Elements within the Operation Plan – these Elements were amended as follows:

1. Element 6 – updated location of intake structure from Northeast to Southeast

2. Element 11 – updated coverage description and alarm notifications

3. Element 14 – updated budgeting timeline statement

4. Appendix C – updated daily/weekly/monthly task lists

5. Appendix D – updated tasks to correct order

6. Appendix E – updated notification requirements and cell phone numbers

7. Appendix H – updated capital plan to current priorities.

**Item 16 – Staff Suggestions:**

1. Looping Third Street East to Fourth Street West north of lift station
2. Plant security and entry requirements
3. Looping Riverview Drive west of Keating
4. Sewer at Nelson/Armit
5. Rainycrest Hyrant – ownership ??
6. Minnie Avenue/Williams/ 8th – unregistered water line
7. Ability to monitor WTP off site
8. Sewer at Armit no top
9. Minnie Avenue at Second East and Third East

**Town of Fort Frances**

**Fort Frances Drinking Water Quality Management System**

**Management Review Meeting Notice**

| | |
|---|---|
| **Date of Notice:** | Friday, August 13, 2021 |
| **Date of Meeting:** | Wednesday, August 25, 2021 |
| **Time of Meeting:** | 1:00 PM |
| **Location of Meeting:** | IFK Meeting Room |

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**DWQMS Team Members:**

Please find attached your agenda packages for the Management Review meeting that is scheduled per above.

Along with your agenda package, you find a copy of the management review minutes from the 2020 Management Review meeting as well as a copy of the report that was submitted to Mayor and Council for their approval.

Craig Miller, P.Eng.
Environmental Superintendent

# Fort Frances Drinking Water System
# Management Review - Meeting Agenda

**Date:** **August 25, 2021**

**Time:** **1:00 pm**

**Location:** **IFK Meeting Room**

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## A. Introduction:

Reference to Operational Plan - Element 20 Management Review

- See attached Element No. 20.

**Period: June 01, 2020 to May 31, 2021**

## B. Review Items:

### 1. Incidents of regulatory non-compliance:

Ministry of the Environment (MECP) Annual Inspection Report (2020/2021)
Date of Inspection: January 8, 2021
Compliance Score: 94.11%
Non-compliance with Regulatory Requirements: Four (4)

- Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O.Reg. 170/03 and/or was not recording data with the prescribed format.
    - Between March 4, 2020 at 20:12 through March 5, 2020 at 07:50, final effluent chlorine residual data and filter effluent turbidity data was not recorded in the SCADA system due to a UPS failure. This has been resolved with new, redundant UPS systems.

- All required written notices of adverse water quality incidents were not provided as per O. Reg. 170/03 16-7.
    - Written notice of an adverse water quality incident was not provided to the Ministry within 24 hours of verbal notification. This has been resolved with training.

- All reporting requirements for lead sampling were not complied with as per schedule 15.1-9 of O. Reg. 170/03.
    - Owners of sample points were not notified by the Town of their test results within 7 days of receiving the results back. This has been resolved and all owners have been notified.

- The Annual Report did not contain the required information and/or was not prepared by February 28th of the following year.
    - The Annual Report submitted to the MECP for 2019 did not include the one adverse test result or corrective action. The 2019 report has since been revised and resubmitted to the MECP, thereby resolving this incident.

2019 Annual Summary Report (Schedule 22) – O. Reg. 170/03
Regulatory requirement: No later than March 31
Reported to O. & F. Executive Committee and Council.
Council Approval March 8, 2021
Date submitted to Ministry of the Environment (MECP): March 9, 2021
Non-compliance with Regulatory Requirements: None

2019 Annual Report – O. Reg. 170/03
Regulatory requirement: Not later than February 28
Date submitted to Ministry of the Environment (MECP): February 24, 2021
Non-compliance with Regulatory Requirements: None

O. Reg. 450/07: Charges for Industrial and Commercial Water Users
Regulatory requirement: Not later than March 31
Date submitted to Ministry of the Environment (MECP): No Submission Required
Non-compliance with Regulatory Requirements: None

O. Reg. 387/04: Water Taking and Reporting
Regulatory requirement: Not later than March 31
Date submitted to Ministry of the Environment (MECP): February 27, 2021
Non-compliance with Regulatory Requirements: None

**2. Incidents of adverse drinking water tests:**

Water Treatment Plant:
No adverse treated water samples.

Water Distribution System:
Six (6) adverse distribution system samples.

| | | | |
|---|---|---|---|
| • | 6/15/2020 | AWQI #150279 | Campground Opening |
| • | 7/21/2020 | AWQI #150860 | Scott St. WM Commissioning |
| • | 9/9/2020 | AWQI #151997 | Colonization Road Cut and Cap |
| • | 9/14/2020 | AWQI #152058 | Colonization Road Cut and Cup |
| • | 12/7/2020 | AWQI #153207 | Weekly Distribution Sample |
| • | 3/22/2021 | AWQI #153752 | Weekly Distribution Sample |

**3. Deviations from critical control-point limits and response actions:**

The QMS Team had undertaken a Risk Assessment review of the risks and their critical control-points/response actions between March 2021 and June 2021.

No changes / additions / deletions were noted.

Reference - Element 7/8

**4. The effectiveness of the risk assessment process:**

Operators reviewed the Risk Assessment process between March 2021 and June 2021. No changes / additions / deletions were noted.

(Reviewed on a yearly basis in accordance with Element 7).

**5. Internal and third-party audit results:**

Internal Audit results:

Latest Internal Audit:
June 29 - July 29, 2021 - undertaken by Cody Vangel
No corrective actions identified.

Previous Audit:

June 18 - July 3, 2020 - undertaken by Adam Mitchell
No corrective actions identified.

External Audit results:

Latest External Audit:
12-Month Surveillance Audit –
Off-Site (November 16, 2020) - undertaken by SAI GLOBAL - Accreditation Program for Operating Authorities.
No non-conformances were identified.

Previous External Audit:
12-Month Upgrade Surveillance Audit –
Off-Site (November 20, 2019) - undertaken by SAI GLOBAL - Accreditation Program for Operating Authorities.
One minor non-conformance was identified. Evidence of written endorsement by top management and owner. Resolved February 14, 2020.

**6. Results of emergency response testing:**

Standard Operating Procedures identified in the Emergency Response Binder was reviewed by the Water System Operators in Q1 2020.

Emergency SOP's Reviewed:

1. Policy 4.24 – SOP No. 1 – for the Destruction (Bombing/Major Fire) of Water Treatment Plant or Water Tower.
2. Policy 4.23 – SOP No. 2 – for Pandemic Situation – Affecting the Water Treatment Plant Operators & Community.
3. Policy 4.15 – SOP No.3 – for Water Main Breaks and Repairs.
4. Policy 4.6 – SOP No. 4 – for breakdown of equipment at the Water Treatment Plant
5. Policy 4.4 – SOP No. 6 – for Raw Water Source Contamination
6. Policy 4.27 – SOP for Standby Generator – WTP

See Attachment B.6.

**7. Operational performance:**

**WTP:**

Actions & Recommendations from MECP:

- As a result of the 2020/2021 MECP inspection, four (4) non-conformances were identified. These have been resolved and/or corrected. See Section B, Item 1.

- To have a Harmful Algae Bloom Monitoring Plan in place by October 28, 2021.

Personnel:

- ORO Brad Webb retired December 31, 2020.
- Jeff St. Pierre of OCWA acted as Remote ORO from Jan 1 to Mar 31
- Greg Wiedenhoeft from WTP OIC to ORO upon Mr. Webb's retirement.
- Paul LeMesurier acting as WTP OIC.
- Jay Bruyere moved to the Water Treatment Plant as OIT.

Maintenance issues:

No issues.

**Distribution System:**
Actions & Recommendations from MECP:

None

Personnel:

Paul LeMesurier now full time at the WTP from Distribution.
Jay Bruyere now full time at the WTP from Distribution.
One vacant operator role in the Water/Wastewater Department.

Maintenance issues:

A total of 12 water main breaks / repairs & a total of 4 service breaks / repairs throughout the Town since the last Management Review.

See Attachment B.7.

Frozen water services to report – 12 residences

Nine (9) Valve replacements were completed in 2020 and one valve was removed:

1) VAL312 – Victoria Ave N @ Sixth St. E
2) VAL057 – Col Rd. W @ Flinders Place
3) VAL115 – Wright Ave @ 4th St. West
4) VAL124 – First St. W @ Wright Ave
5) VAL384 – Scott St. @ Crowe Ave
6) VAL393 – Second St. @ Crowe Ave
7) VAL111 – Fifth St. W @ Wright Ave
8) VAL433 – Second St. @ Frenette Ave
9) VAL112 – Fifth St. W @ Wright Ave

Removed – VAL113 (Wright @ 4th Street West)

Some existing fire hydrants are obsolete with no parts to maintain them. Seven (7) fire hydrants were replaced in 2020:

1) HYD213 – Armit Ave N @ CNR Tracks
2) HYD141 – Thompson St. @ Keating Ave.
3) HYD127 – Midblock of Keating Ave. 500 Block
4) HYD110 – Third St. W @ Keating Ave.
5) HYD286 – Midblock of Fifth St. E 1000 Block
6) HYD276 – Midblock of Third St. E 900 Block
7) HYD302 – Midblock of Williams Ave 1000 Block

**8. Raw water supply and drinking water quality trends:**

No changes in raw water supply and drinking water quality trends.

Regular seasonal water turnover of Rainy Lake.

See Chart - Attachment B.8. (Information obtained from DWSP sampling).

**9. Follow-up on action items from previous management reviews:**

<u>2020 Management Review Items:</u>

a. Lining the water mains under CN tracks along Keating Avenue and Wright Avenue (Sept 2021)
b. Review and clarify the new Ontario Water Main Disinfection Procedure with the MECP and NWHU to ensure clear understanding (Done)
c. Standardize on one type of hydrant and valve for the Town (Not Done Yet)
d. Develop a hydrant maintenance program similar to annual valve exercising program (Not Done Yet)
e. Install Wi-Fi at the water treatment plant (Done)
f. Improve network speeds for uploading videos to network and utilizing GIS (Done @ WTP, Not Done @ PW).

**10. The status of management action items identified between reviews:**

No management action items identified between reviews.

**11. Changes that could affect the Quality Management System (QMS):**

Internal/External Audit: No issues.

Management Review: No issues.

Any new business development upstream of water intake could potentially cause contamination of raw water source or supply. No concerns, at this time.

Information Only:
Where to find – electronically: Revision Updates – Last version. Check electronic version (latest version) found in W:\QMS Documentation\QMS Operational Plan\…file name. (June 18, 2021; Revision No. 14)

**12. Consumer feedback:**

Customer complaints: Last period – 1 complaint; this period 3 complaints (2 for Chlorine, 1 for discoloration).

Notes:

Typical root causes of complaints:

1. Construction projects creating dead-end mains can cause stagnate and discoloured water issues.
2. Water main breaks.
3. Maintenance activities – valve exercising and flushing
4. Strong smell / taste of Chlorine

Customer Complaint Processing form – See Attachment B.12

**13. The resources needed to maintain the Quality Management System (QMS):**

Council's commitment to provide the following:

Personnel – No issues.

Financial – No issues.

**14. The results of infrastructure review:**

Six (6) year capital plan (In OP – Appendix I)
On an annual basis –
Proposed Infrastructure upgrades are discussed and reviewed with operators.
Council reviews and approves.

**WTP:**
On a monthly basis the WTP Overall Responsible Operator generates a report outlining operational and maintenance activities. The report is circulated and reviewed by the Environmental Superintendent., O&F Manager, the O&F Executive Committee and Council.

Upgrades for this period:

Installed new soda ash pump

High lift pump #4 motor rebuild

Replaced Impeller motor on Clarifier #2

Replaced lab bench analyzer

**Water Distribution System:**
On a monthly basis, the Environmental Superintendent generates a report outlining maintenance activities. The report is circulated and reviewed by the O&F Manager and the O&F Executive Committee and Council.

Upgrades during this period:

Water main valve exercise program: 20% per year (Area 5)

Hydrant flushing: flushing annually

Fire hydrant replacements – 7 – see Section 7 for detailed list.

Water main isolation valve replacements – 9 – See Section 7 for detailed list.

Main Replacement (Construction Projects):

Scott Street between Colonization Road East and Reid Avenue

Colonization Road West between Armstrong Place and east end of RV Cemetery

Erin Crescent

Scheduled for 2021 Construction:

Replacement/new installation of water mains and services along the following streets:

a. Armit Avenue between Scott Street and Church Street
b. King's Highway (Pit Road 1 to Pit Road 2)

**15. Operational plan currency, content and updates:**

Current revision date – June 18, 2021, Rev. 14

Updates (since previous period):

Audits - Amended OP after the audit review.

List CAR's and provide copies of Corrective Action Records. None

Document Request Changes (DRC) – document changes to Operation Plan other than the CAR changes as described above. (Spelling, grammar, personnel change, etc.). A result of conducting staff meetings to review the Elements within the Operation Plan these Elements were amended as follows:

1. Element 6 – updated location of intake structure from Northeast to Southeast
2. Element 11 – updated coverage description and alarm notifications
3. Element 14 – updated budgeting timeline statement
4. Appendix C – updated daily / weekly / monthly task lists
5. Appendix D – updated tasks to correct order
6. Appendix E – updated notification requirements and cell phone numbers
7. Appendix H – updated capital plan to current priorities

**16. Staff suggestions:**

Any concerns from operators/staff.

# 20 Management Review

## 20.1 Review Frequency

Top management shall review the QMS once every twelve (12) months to assess and ensure the continuing suitability, adequacy and effectiveness of the QMS.

Management review(s) shall be included in the internal audit schedule.

## 20.2 Review Participants

Management review participants shall include:

- CAO
- Operations & Facilities Manager
- Environmental Superintendent (QMS Representative)
- Overall Responsible Operator
- Operator In Charge (Water Distribution System)

The Operations & Facilities Manager may include other personnel at his discretion.

Attendees shall be notified of the management review meeting by e-mail and/or internal memo.

## 20.3 Review Input

The QMS Representative and the Secretary/Receptionist shall provide a summary of the following information in a suitable format to the management review meeting attendees at least seven (7) days prior to the meeting:

- Incidents of regulatory non-compliance.
- Incidents of adverse drinking-water tests.
- Deviations from critical control-point limits and response actions.
- The effectiveness of the risk assessment process.
- Internal and third-party audit results.
- Results of emergency response testing.
- Operational performance.
- Raw water supply and drinking water quality trends.
- Follow-up on action items from previous management reviews.
- The status of management action items identified between reviews.
- Changes that could affect the QMS.

- Consumer feedback.
- The resources needed to maintain the QMS.
- The results of the infrastructure review.
- Operational plan currency, content and updates.
- Staff suggestions.

## 20.4 Review Process

The QMS Representative shall prepare a meeting agenda and distribute the meeting agenda with the management review data.

The management review participants shall review all data presented, and where necessary, identify opportunities for improvements. These may include opportunities for improvement related to the:

- Effectiveness of the QMS and related procedures.
- Ability of the Operating Authority to implement the QMS
- Provision of adequate human and financial resources.
- The level of consumer satisfaction.

For all opportunities identified, the management review participants shall identify action items, personnel responsible for implementing action items and timelines for action items.

Records of management reviews, recommendations, decisions, action items, personnel responsibilities, and timelines shall be forwarded to the Operations & Facilities Executive Committee upon completion for acceptance and then forward to Council (Owner) of the Town of Fort Frances for review and acceptance.

Records shall be maintained by the QMS Representative. The records shall reflect all new action items and any decisions made by the Management Review Team, deficiencies, personnel responsible for action items, and timelines.

| LOCATON | DATE | TYPE | NOTES |
|---|---|---|---|
| 504 CHURCH STREET | 29-Dec-20 | WATER SERVICE | REPLACED 10FT LEAD WATER SERVICE FROM MAIN TO CS WITH 3/4" COPPER |
| 428 VICTORIA AVENUE | 9-Feb-21 | WATER SERVICE | CS CAME APART ON TOWN PROPERTY |
| 1003 COLONIZATION ROAD WEST | 22-Mar-21 | WATER SERVICE | REPLACED 4 M OF 1/2" COPPER FROM CS TO CURBLINE |
| 1548 KINGS HWY | 19-May-21 | WATER SERVICE | Repaired water service |
| | | | |
| CHURCH AT MOSHER | 23-Jun-20 | WATERMAIN | REPAIR WATER MAIN VALVE |
| WRIGHT AT 4TH ST W | 2-Jul-20 | WATERMAIN | WATER MAIN REPAIR |
| 414 FIFTH STREET WEST | 16-Jul-20 | WATERMAIN | WATER MAIN REPAIR |
| 900 WRIGHT AVENUE | 22-Jul-20 | WATERMAIN | REPLACED FAILED WATER MAIN VALVE |
| 826 SECOND STREET EAST | 26-Nov-20 | WATERMAIN | WL0345 - WATERMAIN SPLIT AT HYDRANT TEE (HYD257) |
| 802 SECOND STREET EAST | 27-Nov-20 | WATERMAIN | REPLACED VALVE - BONNET HAD BLOWN |
| SECOND ST E @ FRENETTE AVE | 27-Nov-20 | WATERMAIN | WL0345 - REPAIRED AT VAL433 (BONNET CAME OFF VALVE) - REPLACED VALVE, REPAIRED MAIN |
| 225 CHURCH STREET | 12-Jan-21 | WATERMAIN | BREAK REPAIR |
| 213 crowe avenue | 9-Mar-21 | WATERMAIN | WATERMAIN REPAIR |
| 4TH STREET W @ WRIGHT AVE | 6-May-21 | WATERMAIN | WATERMAIN REPAIR |
| 5TH STREET W @ WRIGHT AVE | 12-May-21 | WATERMAIN | WATERMAIN REPAIR |
| 6TH STREET E @ CNR TRACKS | 20-May-21 | WATERMAIN | WATERMAIN REPAIR |

# Source Water Assessment Data

## E. Coli & T. Coliform - Raw

| Sample Type | Year | Number of Samples | Range of E. Coli or Fecal Results (min #)-(max #) | Range of Total Coliform Results (min #)-(max #) | Number of HPC Samples | Range of HPC Results (min #)-(max #) |
|---|---|---|---|---|---|---|
| Raw | 2020 | 45** | E.C.: <1 - 14 | <1 - 291 | N/A | N/A |
| Treated | 2020 | 45** | 0 | 0 | 43 | 0 - 44 |
| Distribution | 2020 | 427** | 0 | 0 | 214 | 0 - 45 |
| Raw | 2019 | 52 | E.C.: <1 - 30 | <1 - 272 | N/A | N/A |
| Treated | 2019 | 52 | 0 | 0 | 52 | 0 - 2 |
| Distribution | 2019 | 320 | 0 | 0 | 143 | 0 - 10 |
| Raw | 2018 | 51* | E.C.: <1 - 30 | <1 - 272 | N/A | N/A |
| Treated | 2018 | 51* | 0 | 0 | 51* | 0 - 2 |
| Distribution | 2018 | 451 | 0 | 0 | 161 | 0 - 10 |
| Raw | 2017 | 51* | E.C.: <1 - 4 | <1 - 517 | N/A | N/A |
| Treated | 2017 | 52 | 0 | 0 | 52 | 0 - 2 |
| Distribution | 2017 | 538 | 0 | 0 | 109 | 0 - 4 |
| Raw | 2016 | 52 | E.C.: <1 - 6 | <1 - 236 | N/A | N/A |
| Treated | 2016 | 52 | 0 | 0 | 52 | 0 - 4 |
| Distribution | 2016 | 236 | 0 | 0 | 137 | 0 - 168 |
| Raw | 2015 | 52 | E.C.: <1 - 9 | <1 - 326 | N/A | N/A |
| Treated | 2015 | 52 | 0 | 0 | 52 | 0 - 1 |
| Distribution | 2015 | 538 | 0 | 0 | 197 | 0 - 54 |

* indicates that a sample froze during shipment between Christmas Day and New Year's Day.

** Number of samples is based on year-to-date.

**Source Water Assessment Data - ORGANICS**

| ANALYTE | Units | 2020 | 2019 | 2018 | 2017 | 2016 | Avg | Ded. Limit |
|---|---|---|---|---|---|---|---|---|
| 1,1-dichloroethylene (vinylidene chlorid | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 1,2-Dichlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 1,2-dichloroethane | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 1,4-Dichlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 1,4-Difluorobenzene | % | 100.9 | 98.3 | 99.1 | 102.6 | 94.2 | 99.0 | 1 |
| 2,3,4,6-Tetrachlorophenol | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 2,4,5-T | ug/L | | | | | <0.20 | <0.20 | 0.2 |
| 2,4,6-Tribromophenol | % | 100.9 | 111.1 | 113.4 | 99.2 | 93 | 103.5 | 1 |
| 2,4,6-Trichlorophenol | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| 2,4-D | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| 2,4-Dichlorophenol | ug/L | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | 0.3 |
| 2,4-Dichlorophenylacetic Acid | % | 81.9 | 88.0 | 105.9 | 90.9 | 98.6 | 93.1 | 1 |
| 2-Fluorobiphenyl | % | 87.3 | 61.0 | 78.0 | 77.4 | 91.4 | 79.0 | 1 |
| 4-Bromofluorobenzene | % | 98.9 | 95.7 | 89.8 | 96.2 | 86.9 | 93.5 | 1 |
| a-chlordane | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Alachlor | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| alpha-Chlordane | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Antimony (Sb)-Total | ug/L | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | 0.6 |
| alpha-BHC | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| alpha-Endosulfan | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Aroclor 1242 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.02 |
| Aroclor 1254 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.02 |
| Aroclor 1260 | ug/L | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.02 |
| Arsenic (As)-Total | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| Atrazine | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Atrazine & Metabolites | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Atrazine Desethyl | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Azinphos-methyl | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Barium (Ba)-Total | ug/L | <10 | <10 | <10 | <10 | <10 | <10 | 10 |
| Benzene | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| Benzo(a)pyrene | ug/L | <0.0050 | <0.010 | <0.010 | <0.010 | <0.010 | <0.0050 | 0.005 |
| Boron (B)-Total | ug/L | <50 | <50 | <50 | <50 | <50 | <50 | 50 |
| beta-BHC | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| beta-Endosulfan | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Bromoxynil | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Cadmium (Cd)-Total | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Carbaryl | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Carbofuran | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Carbon tetrachloride | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.50 | <0.20 | 0.2 |
| Chlorpyrifos | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Chromium (Cr)-Total | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| d14-Terphenyl | % | 91.8 | 96.7 | 90.8 | 110.5 | 96.5 | 97.3 | 1 |
| d14-Terphenyl | % | 105.6 | 84.5 | 96.4 | 98.2 | 113.2 | 99.6 | 1 |
| delta-BHC | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Diazinon | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Dicamba | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Dichloromethane | ug/L | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 5 |
| Diclofop-methyl | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Dieldrin | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Dimethoate | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Dinoseb | ug/L | | | | | <0.20 | <0.20 | 0.2 |

**Source Water Assessment Data - ORGANICS**

| ANALYTE | Units | 2020 | 2019 | 2018 | 2017 | 2016 | Avg | Ded. Limit |
|---|---|---|---|---|---|---|---|---|
| Diquat | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| Diuron | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| Ethylbenzene | ug/L | | <0.50 | <0.50 | | | <0.50 | 0.5 |
| Endosulfan Sulfate | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Endrin | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Endrin Aldehyde | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Ethylbenzene | ug/L | <0.50 | | | | | <0.50 | 0.5 |
| Fluoride (F) | mg/L | 0.780 | | | | | 0.780 | 0.02 |
| gamma-Chlordane | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Glyphosate | ug/L | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 5 |
| Heptachlor | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Heptachlor Epoxide | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Lindane | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| m/p-xylene | ug/L | <1.0 | <1.0 | <1.0 | | | <1.0 | 1 |
| Malathion | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| MCPA | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Mercury (Hg)-Total | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Methoxychlor | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Metolachlor | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Metribuzin | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Mirex | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| Monochlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| Nitrate (as N) | ug/L | 0.101 | 0.1 | 0.086 | 0.092 | 0.074 | 0.091 | 0.02 |
| Nitrate and Nitrite as N | mg/L | 0.101 | 0.1 | 0.086 | 0.092 | 0.074 | 0.091 | 0.04 |
| Nitrite (as N) | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.01 |
| o,p-DDD | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| o,p-DDE | ug/L | <0.10 | | | | | <0.10 | 0.1 |
| o,p-DDT | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Oxychlordane | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| o-xylene | ug/L | <0.50 | <0.50 | <0.50 | | | <0.50 | 0.5 |
| Paraquat | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| Pentachlorophenol | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| Phorate | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Picloram | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| p,p-DDD | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| p,p-DDE | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| p,p-DDT | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Prometryne | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Selenium (Se)-Total | ug/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1 |
| Simazine | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Sodium (Na)-Total | mg/L | 18.2 | | | | | 18.2 | 0.5 |
| Terbufos | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Tetrachloroethylene (perchloroethylene) | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 |
| Toluene | ug/L | <0.50 | <0.50 | <0.50 | | | <0.50 | 0.5 |
| Total PCBs | ug/L | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | 0.035 |
| Triallate | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Trichloroethylene | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | 1.43 | <0.50 | 0.5 |
| Trifluralin | ug/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.1 |
| Uranium (U)-Total | ug/L | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2 |
| Vinyl chloride | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |
| Xylenes (Total) | ug/L | <1.5 | | | | | <1.5 | 1.5 |

**Attachment B.8**

# Raw Water Supply and Drinking Water Quality Trends

**Source Water Assessment Data**

Raw Water Quality Trends:

| | Paramaters | | | | |
|---|---|---|---|---|---|
| | **Alkalinity** | **Colour** | **pH** | **THMs** | |
| **Date Sampled** | **(mg/L)** | **(TCU)** | | **(ug/L)** | |
| Feb. 13, 2012 | 21 | 28.1 | 7.36 | 0.5 | |
| May 15, 2012 | 20.1 | 25.3 | 7.37 | 0.5 | |
| Aug. 28, 2012 | 20.5 | 25.5 | 7.56 | 0.5 | |
| Aug. 19, 2013 | 16.9 | 38.6 | 7.52 | 0.1 | |
| Oct. 29, 2013 | 20.4 | 30.4 | 7.46 | 0.1 | |
| Feb. 11, 2014 | Samples Froze | | | | |
| April 29, 2014 | 20.1 | 25.3 | 7.37 | 0.5 | |
| July 22, 2014 | | 40.7 | 6.91 | 0.1 | |
| Nov. 24, 2014 | Samples Froze | | | | |
| April 8, 2015 | 15 | 41.9 | 7.13 | 0.1 | |
| May 25, 2015 | Data not received from lab | | | | |
| August 4, 2015 | 17.2 | 38.0 | 7.35 | 0.1 | |
| October 26, 2015 | 16.1 | 32.9 | 7.28 | 0.1 | |
| March 9, 2016 | 16.3 | 38.0 | 7.37 | 0.1 | |
| May 16, 2016 | 16.3 | 38.0 | 7.37 | 0.1 | |
| October 7, 2016 | | 38.0 | 7.05 | 0.1 | |
| February 28, 2017 | | 32.9 | 7.37 | 0.1 | |
| August 9, 2017 | Data not received from lab | | | | |
| November 8, 2017 | 21.5 | 33.8 | 7.53 | 0.1 | |
| January 17, 2018 | | 32.4 | 7.22 | 0.1 | |
| May 7, 2018 | 15.8 | 35.4 | 6.97 | 0.1 | |
| July 26, 2018 | | 38.8 | 6.86 | 0.2 | |
| October 30, 2018 | 17.2 | 34.9 | 7.12 | 0.1 | |
| March 11, 2019 | | 36.3 | 6.97 | 0.1 | |
| May 8, 2019 | 17.8 | | 6.92 | 0.1 | No colour data |
| July 23, 2019 | | | 7.03 | | No colour data |
| November 5, 2019 | | | | | No raw water data |

Data taken from DWSP Samples unless otherwise indicated

First Engineers Report - Characterization of Raw Water Supply Source

Colour - Range of 30 - 40 TCU
Alkalinity - Very low (Pose a challenge in chemical removal of organic and colour)
Dissolved Organic Carbon - Usually around 9.0 mg/L

**Alkalinity - defined as its capacity to neutralize acid. (pH less than 7)**
**pH - A measure of the acidity or alkalinity of a solution (Neutral is 7)**
**THMs (Trihalomethanes) - Are created when chlorine is added to water. They are toxic chemical substances that consist of a methane molecule and one of the halogen elements.**

**Data collected from other sources**

**Attachment B.8**

**Source Water Assessment Data**

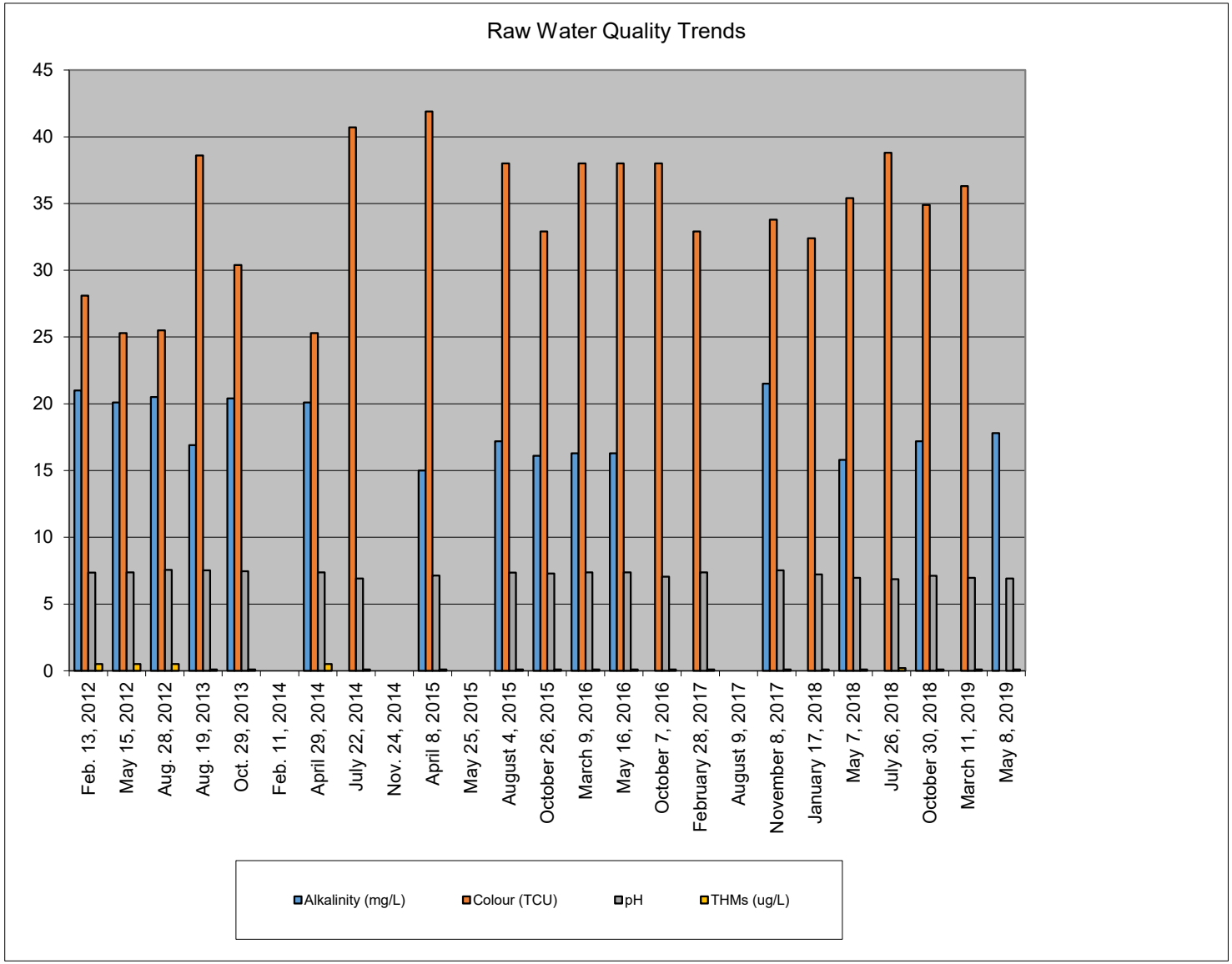
Treated Water Quality Trends:

| | Paramaters | | | | |
|---|---|---|---|---|---|
| | **Alkalinity** | **Colour** | **pH** | **THMs** | |
| **Date Sampled** | **(mg/L)** | **(TCU)** | | **(ug/L)** | |
| February 13, 2012 | 35.2 | 1.0 | 7.59 | 49 | Data taken from DWSP Samples unless otherwise indicated |
| May 15, 2012 | 30.5 | 3.5 | 7.46 | 53.5 | |
| August 28, 2012 | 25.6 | 1.2 | 7.63 | 71 | |
| Nov. 14, 2012 | 33.9 | 0.2 | 7.73 | 42.3 | |
| May 6, 2013 | 29.3 | 2.6 | 7.59 | 43.5 | |
| August 19, 2013 | 22.6 | 1.1 | 7.43 | 68.3 | |
| October 29, 2013 | 27.2 | 1.1 | 7.49 | 56 | |
| February 11, 2014 | Samples Froze | | | | |
| April 29, 2014 | 30.5 | 3.5 | 7.46 | 53.5 | |
| July 22, 2014 | 33.4 | 1.5 | 7.09 | 95.0 | |
| Nov. 24, 2014 | Samples Froze | | | | |
| April 8, 2015 | 31.3 | 1.8 | 7.43 | 53.7 | |
| May 25, 2015 | Data not received from lab | | | | |
| August 4, 2015 | 27.4 | 1.6 | 7.38 | 86.5 | |
| October 26, 2015 | 29.1 | 1.0 | 7.39 | 61.3 | |
| March 9, 2016 | 24.0 | 1.8 | 7.36 | 50.1 | |
| May 16, 2016 | 24.0 | 1.8 | 7.36 | 50.1 | |
| October 7, 2016 | | 1.0 | 7.18 | 81.7 | |
| February 28, 2017 | | 1.7 | 7.28 | 44.1 | |
| August 9, 2017 | Data not received from lab | | | | |
| November 8, 2017 | 35.5 | 1.3 | 7.75 | 54.0 | |
| January 17, 2018 | | 1.1 | 6.87 | 48.3 | |
| May 7, 2018 | 29.3 | 1.8 | 7.09 | 51.9 | |
| July 26, 2018 | | 1.6 | 6.94 | 92 | |
| October 30, 2018 | 31.4 | 1.0 | 7.14 | 32 | |
| March 11, 2019 | | 0.8 | 6.99 | 53 | |
| May 8, 2019 | 30.7 | | 7.01 | 56 | No colour data |
| July 23, 2019 | | | 7.24 | | No colour data |
| November 5, 2019 | | | | | No treated water data |

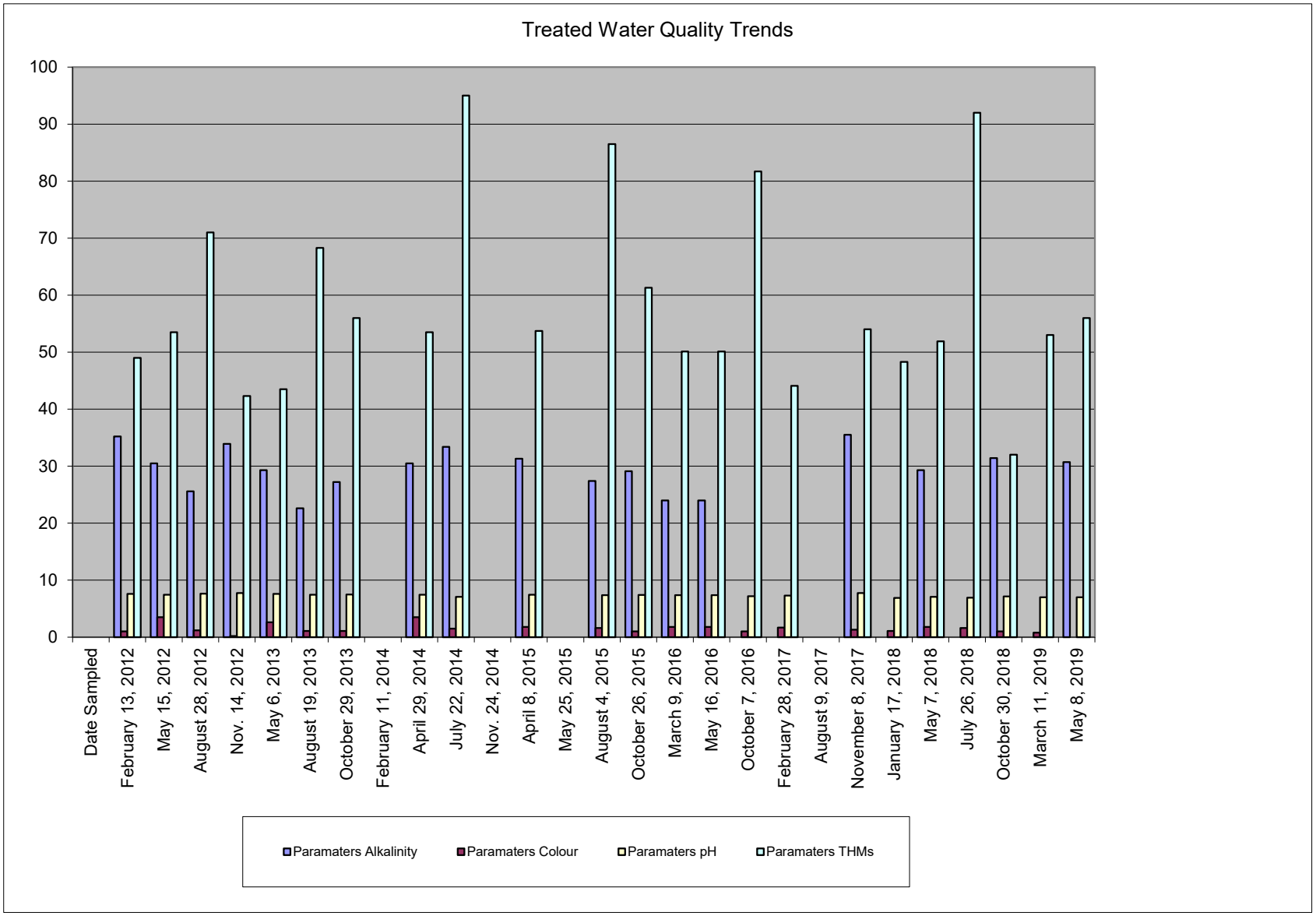
**Alkalinity - defined as its capacity to neutralize acid. (pH less than 7)**
**pH - A measure of the acidity or alkalinity of a solution (Neutral is 7)**
**THMs (Trihalomethanes) - Are created when chlorine is added to water. They are toxic chemical substances that consist of a methane molecule and one of the halogen elements.**

**Data collected from other sources**

**Attachment B.8**



**Attachment B.8**



## Source Water Assessment Data

### Turbidity - Raw (NTU)

**2020**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 0.93 | 0.88 | 0.83 | 0.88 | 0.93 | 0.90 | 0.55 | 0.86 | 0.60 | 0.54 | 0.58 | 0.67 | 0.54 | 0.66 | 0.65 | 0.56 | 0.53 | 0.65 | 0.71 | 0.73 | 0.49 | 0.39 | 0.60 | 0.42 | 0.14 | 0.92 | 0.76 | 0.81 | 0.88 | 0.59 | 0.71 | **0.67** | **0.93** | **0.14** | |
| February | 0.80 | 0.77 | 0.54 | 0.52 | 0.48 | 0.63 | 0.64 | 0.69 | 1.03 | 0.68 | 0.30 | 0.60 | 0.85 | 0.69 | 0.77 | 0.51 | 0.49 | 0.64 | 0.48 | 0.52 | 0.63 | 0.54 | 0.60 | 0.61 | 0.63 | 0.49 | 0.55 | 0.79 | 0.75 | | | **0.63** | **1.03** | **0.30** | |
| March | 0.74 | 0.68 | 0.65 | 0.52 | 0.53 | 0.53 | 0.52 | 0.55 | 0.59 | 0.56 | 1.00 | 0.73 | 0.72 | 1.00 | 0.65 | 0.79 | 0.59 | 0.72 | 0.48 | 0.55 | 0.51 | 0.57 | 0.55 | 0.59 | 0.62 | 0.62 | 0.54 | 0.52 | 0.60 | 0.59 | 0.59 | **0.63** | **1.00** | **0.48** | |
| April | 0.55 | 0.57 | 0.59 | 0.61 | 0.66 | 0.59 | 0.63 | 0.61 | 0.55 | 0.58 | 0.63 | 0.64 | 0.59 | 0.74 | 0.98 | 0.77 | 0.81 | 0.83 | 0.83 | 0.98 | 0.88 | 0.84 | 0.97 | 0.89 | 0.94 | 0.83 | 0.78 | 0.79 | 0.96 | 1.08 | | **0.76** | **1.08** | **0.55** | |
| May | 1.02 | 0.97 | 1.10 | 1.29 | 1.38 | 1.43 | 1.67 | 1.49 | 1.41 | 1.44 | 1.47 | 1.43 | 1.51 | 1.46 | 1.55 | 1.48 | 1.44 | 1.50 | 1.49 | 1.40 | 1.04 | 1.26 | 0.91 | 1.05 | 1.06 | 1.22 | 1.07 | 1.22 | 1.31 | 1.35 | 1.22 | **1.31** | **1.67** | **0.91** | |
| June | 1.31 | 1.22 | 1.34 | 1.36 | 1.23 | 1.28 | 1.30 | 1.66 | 1.54 | 1.33 | 1.64 | 1.40 | 1.50 | 1.53 | 1.55 | 1.60 | 1.63 | 1.58 | 1.63 | 1.58 | 1.63 | 1.69 | 1.64 | 1.55 | 1.26 | 1.48 | 1.52 | 1.43 | 1.44 | 1.47 | | **1.48** | **1.69** | **1.22** | |
| July | 1.26 | 1.31 | 1.64 | 1.16 | 1.21 | 1.86 | 1.34 | 1.55 | 1.43 | 1.63 | 1.67 | 1.66 | 1.69 | 1.65 | 1.62 | 1.79 | 1.64 | 1.66 | 1.70 | 1.69 | 1.67 | 1.37 | 1.45 | 1.29 | 1.24 | 1.27 | 1.20 | 1.54 | 1.42 | 1.13 | 1.27 | **1.48** | **1.86** | **1.13** | |
| August | 1.33 | 1.12 | 1.13 | 1.15 | 1.20 | 1.05 | 1.01 | 0.93 | 1.02 | 0.97 | 1.24 | 1.66 | 1.36 | 1.39 | 1.31 | 1.35 | 1.40 | 1.42 | 1.45 | 1.40 | 1.31 | 1.33 | 1.35 | 1.36 | 1.30 | 1.35 | 1.41 | 1.44 | 1.38 | 1.43 | 1.48 | **1.29** | **1.66** | **0.93** | |
| September | 1.37 | 1.36 | 1.30 | 1.58 | 1.59 | 1.66 | 1.65 | 1.60 | 1.71 | 1.56 | 1.69 | 1.56 | 1.26 | 1.47 | 1.65 | 1.31 | 1.31 | 1.28 | 1.25 | 1.22 | 1.03 | 1.67 | 1.32 | 1.29 | 1.29 | 1.31 | 1.13 | 1.06 | 1.11 | 1.20 | | **1.39** | **1.71** | **1.03** | |
| October | 1.14 | 1.19 | 1.22 | 1.17 | 1.29 | 1.15 | 1.20 | 1.22 | 1.49 | 1.29 | 1.68 | 1.10 | 1.63 | 1.63 | 1.66 | 1.68 | 1.66 | 1.43 | 1.52 | 1.45 | 1.50 | 1.47 | 1.43 | 1.17 | 1.54 | 1.60 | 1.14 | 1.38 | 1.23 | 1.62 | 1.65 | **1.40** | **1.68** | **1.10** | |
| November | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| December | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1.10** | **1.86** | **0.14** | **Yearly** |

**2019**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1.17 | 1.09 | 1.11 | 1.21 | 1.30 | 1.27 | 1.34 | 1.23 | 1.19 | 1.12 | 1.18 | 1.16 | 1.22 | 1.29 | 1.19 | 1.24 | 1.27 | 1.20 | 1.18 | 1.22 | 1.19 | 1.24 | 1.25 | 1.30 | 1.22 | 1.27 | 1.24 | 1.27 | 1.22 | 1.19 | 1.24 | **1.22** | **1.34** | **1.09** | |
| February | 1.18 | 1.22 | 1.16 | 1.23 | 1.24 | 1.28 | 1.21 | 1.26 | 1.31 | 1.25 | 1.17 | 1.24 | 1.22 | 1.26 | 1.29 | 1.29 | 1.19 | 1.23 | 1.27 | 1.16 | 1.19 | 1.26 | 1.16 | 1.22 | 1.26 | 1.22 | 1.27 | 1.25 | | | | **1.23** | **1.31** | **1.16** | |
| March | 1.23 | 1.31 | 1.33 | 1.28 | 1.23 | 1.24 | 1.19 | 1.23 | 1.27 | 1.22 | 1.27 | 1.23 | 1.12 | 1.01 | 1.17 | 1.25 | 1.22 | 1.26 | 1.23 | 1.00 | 1.16 | 1.21 | 1.25 | 1.22 | 1.26 | 1.25 | | 1.28 | 1.25 | 1.21 | 1.18 | **1.22** | **1.33** | **1.00** | |
| April | 1.24 | 1.17 | 1.19 | 1.26 | 1.31 | 1.17 | 1.26 | 1.21 | 1.24 | 1.28 | 1.23 | 1.27 | 1.22 | 1.21 | 1.26 | 1.30 | 1.23 | 1.26 | 1.31 | 1.29 | 1.26 | 1.23 | 1.25 | 1.30 | 1.28 | 1.22 | 1.19 | 1.31 | 1.29 | 1.21 | | **1.25** | **1.31** | **1.17** | |
| May | 1.16 | 1.21 | 1.18 | 1.14 | 1.19 | 1.11 | 1.10 | 1.21 | 1.19 | 1.23 | 1.28 | 1.21 | 1.18 | 1.26 | 1.19 | 1.27 | 1.31 | 1.21 | 1.27 | 1.22 | 1.26 | 1.23 | 1.19 | 1.24 | 1.21 | 1.19 | 1.23 | 1.26 | 1.29 | 1.22 | 1.26 | **1.22** | **1.31** | **1.10** | |
| June | 1.27 | 1.24 | 1.30 | 1.29 | 1.22 | 1.24 | 1.56 | 1.15 | 1.28 | 1.51 | 1.28 | 1.56 | 1.77 | 1.61 | 1.66 | 1.55 | 1.51 | 1.37 | 1.46 | 1.34 | 1.38 | 1.31 | 1.36 | 1.34 | 1.32 | 1.85 | 1.84 | 1.67 | 1.51 | 1.34 | | **1.44** | **1.85** | **1.15** | |
| July | 1.68 | 1.64 | 1.45 | 1.33 | 1.39 | 1.44 | 1.41 | 1.47 | 1.39 | 1.42 | 1.37 | 1.45 | 1.23 | 1.31 | 0.74 | 1.65 | 1.43 | 1.19 | 1.75 | 1.89 | 1.45 | 1.11 | 1.67 | 1.33 | 1.66 | 1.52 | 1.42 | 1.41 | 1.14 | 1.14 | 1.46 | **1.42** | **1.89** | **0.74** | |
| August | 1.09 | 1.42 | 1.36 | 1.31 | 1.39 | 1.18 | 1.16 | 1.19 | 1.24 | 1.20 | 1.15 | 1.10 | 0.98 | 1.08 | 1.18 | 1.15 | 1.20 | 1.11 | 1.22 | 1.33 | 1.26 | 1.21 | 1.26 | 1.31 | 1.27 | 1.29 | 1.14 | 1.26 | 1.41 | 1.54 | 1.77 | **1.25** | **1.77** | **0.98** | |
| September | 1.32 | 1.22 | 1.35 | 1.47 | 1.32 | 1.69 | 1.26 | 1.24 | 1.06 | 1.17 | 1.12 | 1.22 | 1.31 | 1.28 | 1.18 | 1.42 | 1.45 | 1.24 | 1.32 | 1.53 | 1.51 | 1.64 | 1.47 | 1.48 | 1.24 | 1.23 | 1.32 | 1.28 | 1.42 | 1.86 | | **1.35** | **1.86** | **1.06** | |
| October | 1.71 | 1.42 | 1.61 | 1.39 | 1.51 | 1.41 | 1.42 | 1.38 | 1.44 | 1.47 | 1.50 | 1.38 | 1.44 | 1.30 | 1.26 | 1.78 | 1.16 | 1.47 | 1.28 | 1.35 | 1.23 | 1.53 | 1.22 | 1.37 | 1.47 | 1.18 | 1.32 | 1.24 | 1.19 | 1.14 | 1.93 | **1.40** | **1.93** | **1.14** | |
| November | 1.26 | 0.91 | 0.91 | 1.22 | 1.27 | 1.23 | 1.33 | 1.26 | 1.29 | 1.32 | 1.36 | 1.05 | 1.05 | 1.28 | 1.04 | 0.99 | 1.06 | 1.31 | 1.05 | 1.27 | 1.12 | 1.14 | 0.90 | 0.96 | 1.20 | 0.85 | 1.35 | 1.11 | 1.01 | 0.89 | | **1.13** | **1.36** | **0.85** | |
| December | 1.24 | 1.60 | 1.63 | 1.55 | 1.59 | 1.38 | 1.45 | 1.50 | 1.47 | 0.89 | 0.84 | 0.88 | 0.83 | 1.01 | 0.89 | 0.94 | 1.01 | 0.83 | 0.78 | 0.91 | 0.74 | 1.07 | 1.14 | 0.87 | 0.89 | 0.72 | 0.77 | 0.78 | 0.61 | 0.84 | 0.86 | **1.05** | **1.63** | **0.61** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1.26** | **1.93** | **0.61** | **Yearly** |

**2018**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 0.86 | 0.93 | 0.91 | 0.96 | 0.99 | 0.90 | 0.93 | 0.95 | 0.96 | 0.93 | 0.95 | 0.94 | 0.94 | 0.91 | 0.89 | 0.82 | 0.77 | 0.73 | 0.60 | 0.79 | 0.75 | 0.63 | 0.52 | 0.47 | 0.50 | 0.46 | 0.57 | 0.55 | 0.49 | 0.50 | 0.47 | **0.76** | **0.99** | **0.46** | |
| February | 0.45 | 0.44 | 0.44 | 0.51 | 0.41 | 0.44 | 0.43 | 0.40 | 0.64 | 0.58 | 0.54 | 0.51 | 0.55 | 0.59 | 0.50 | 0.57 | 0.52 | 0.60 | 0.60 | 0.63 | 0.58 | 0.60 | 0.55 | 0.51 | 0.45 | 0.48 | 0.47 | 0.45 | | | | **0.52** | **0.64** | **0.40** | |
| March | 0.41 | 0.44 | 0.51 | 0.48 | 0.45 | 0.44 | 0.47 | 0.47 | 0.47 | 0.41 | 0.44 | 0.43 | 0.41 | 0.43 | 0.51 | 0.44 | 0.42 | 0.45 | 0.44 | 0.56 | 0.49 | 0.44 | 0.51 | 0.44 | 0.49 | 0.45 | 0.46 | 0.49 | 0.44 | 0.41 | 0.40 | **0.45** | **0.56** | **0.40** | |
| April | 0.45 | 0.48 | 0.49 | 0.47 | 0.44 | 0.48 | 0.48 | 0.43 | 0.49 | 0.47 | 0.48 | 0.54 | 0.44 | 0.47 | 0.46 | 0.49 | 0.52 | 0.49 | 0.46 | 0.47 | 0.41 | 0.49 | 0.44 | 0.48 | 0.54 | 0.61 | 0.60 | 0.55 | 0.58 | 0.61 | | **0.49** | **0.61** | **0.41** | |
| May | 0.63 | 0.61 | 0.60 | 0.57 | 0.63 | 0.70 | 0.67 | 0.65 | 0.70 | 0.73 | 0.68 | 0.71 | 0.77 | 1.01 | 1.19 | 1.53 | 1.47 | 1.63 | 1.76 | 1.79 | 1.36 | 1.44 | 1.47 | 1.54 | 1.67 | 1.74 | 1.66 | 1.70 | 1.33 | 1.46 | | **1.15** | **1.79** | **0.57** | |
| June | 1.60 | 1.71 | 1.75 | 1.68 | 1.73 | 1.59 | 1.61 | 1.71 | 1.68 | 1.77 | 1.75 | 1.77 | 1.71 | 1.63 | 1.74 | 1.82 | 1.73 | 1.84 | 1.76 | 1.77 | 1.79 | 1.81 | 1.88 | 1.71 | 1.77 | 1.91 | 1.88 | 1.96 | 1.91 | 1.89 | | **1.76** | **1.96** | **1.59** | |
| July | 1.55 | 1.77 | 1.63 | 1.88 | 1.96 | 1.87 | 1.94 | 1.99 | 1.91 | 1.87 | 1.81 | 1.88 | 1.99 | 1.85 | 1.88 | 1.85 | 1.93 | 1.79 | 1.72 | 1.88 | 1.81 | 1.96 | 1.95 | 1.87 | 1.90 | 1.92 | 1.75 | 1.86 | 1.94 | 1.87 | 1.88 | **1.86** | **1.99** | **1.55** | |
| August | 1.95 | 1.89 | 1.99 | 1.81 | 1.86 | 1.88 | 1.83 | 1.91 | 1.93 | 1.97 | 1.88 | 1.90 | 1.81 | 1.87 | 1.89 | 1.92 | 1.78 | 1.88 | 1.79 | 1.81 | 1.91 | 1.50 | 1.47 | 1.61 | 1.52 | 1.55 | 1.47 | 1.60 | 1.58 | 1.63 | 1.68 | **1.78** | **1.99** | **1.47** | |
| September | 1.88 | 1.89 | 1.73 | 1.80 | 1.90 | 1.71 | 1.87 | 1.69 | 1.72 | 1.87 | 1.82 | 1.77 | 1.72 | 1.83 | 1.85 | 1.75 | 1.71 | 1.68 | 1.75 | 1.84 | 1.79 | 1.75 | 1.90 | 1.93 | 1.87 | 1.82 | 1.79 | 1.66 | 1.62 | 1.76 | | **1.79** | **1.93** | **1.62** | |
| October | 1.77 | 1.83 | 1.82 | 1.82 | 1.80 | 1.88 | 1.81 | 1.88 | 1.78 | 1.75 | 1.64 | 1.68 | 1.71 | 1.65 | 1.66 | 1.73 | 1.60 | 1.84 | 1.76 | 1.81 | 1.88 | 1.86 | 1.76 | 1.69 | 1.72 | 1.78 | 1.66 | 1.77 | 1.81 | 1.71 | 1.68 | **1.76** | **1.88** | **1.60** | |
| November | 1.40 | 1.43 | 1.51 | 1.41 | 1.37 | 1.54 | 1.41 | 1.36 | 1.41 | 1.36 | 1.32 | 1.33 | 1.30 | 1.34 | 1.40 | 1.33 | 1.37 | 1.40 | 1.37 | 1.32 | 1.41 | 1.37 | 1.34 | 1.40 | 1.42 | 1.33 | 1.36 | 1.30 | 1.39 | 1.26 | | **1.38** | **1.54** | **1.26** | |
| December | 1.26 | 1.32 | 1.39 | 1.36 | 1.33 | 1.29 | 1.35 | 1.26 | 1.21 | 1.31 | 1.27 | 1.29 | 1.34 | 1.31 | 1.27 | 1.40 | 1.32 | 1.29 | 1.33 | 1.21 | 1.18 | 1.22 | 1.19 | 1.20 | 1.25 | 1.21 | 1.20 | 1.26 | 1.19 | 1.14 | 1.11 | **1.27** | **1.40** | **1.11** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1.25** | **1.99** | **0.40** | **Yearly** |

**2017**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1.11 | 1.02 | 0.96 | 0.94 | 0.96 | 0.91 | 0.90 | 0.92 | 0.96 | 1.01 | 0.93 | 0.81 | 0.79 | 0.77 | 0.71 | 0.77 | 0.78 | 0.71 | 0.68 | 0.73 | 0.72 | 0.69 | 0.76 | 0.80 | 0.78 | 0.76 | 0.81 | 0.76 | 0.81 | 0.77 | 0.74 | **0.83** | **1.11** | **0.68** | |
| February | 0.81 | 0.76 | 0.69 | 0.72 | 0.77 | 0.74 | 0.77 | 0.82 | 0.86 | 0.78 | 0.76 | 0.71 | 0.80 | 0.73 | 0.82 | 0.80 | 0.77 | 0.80 | 0.83 | 0.87 | 0.82 | 0.88 | 0.84 | 0.91 | 0.94 | 0.92 | 0.87 | 0.91 | | | | **0.81** | **0.94** | **0.69** | |
| March | 0.93 | 0.89 | 0.95 | 0.92 | 0.99 | 0.87 | 0.99 | 0.92 | 0.98 | 0.90 | 0.92 | 0.91 | 0.92 | 0.93 | 0.97 | 0.93 | 0.99 | 0.95 | 0.91 | 1.01 | 0.97 | 0.93 | 0.91 | 0.98 | 1.07 | 1.01 | 0.94 | 1.09 | 1.11 | 0.88 | 1.01 | **0.96** | **1.11** | **0.87** | |
| April | 0.91 | 0.93 | 0.98 | 0.91 | 0.89 | 0.92 | 0.94 | 0.91 | 0.93 | 0.99 | 0.97 | 0.94 | 1.02 | 0.98 | 0.92 | 1.03 | 0.96 | 1.05 | 0.98 | 0.92 | 0.92 | 0.91 | 0.89 | 0.98 | 1.01 | 1.03 | 1.09 | 1.01 | 1.07 | 1.12 | | **0.97** | **1.12** | **0.89** | |
| May | 1.05 | 0.99 | 0.93 | 0.98 | 0.92 | 0.95 | 1.00 | 1.03 | 0.98 | 0.94 | 1.04 | 1.09 | 1.00 | 0.97 | 1.01 | 0.97 | 0.99 | 1.07 | 1.10 | 1.11 | 1.15 | 1.14 | 1.18 | 1.11 | 1.01 | 1.09 | 1.15 | 1.15 | 1.20 | 1.17 | 1.10 | **1.05** | **1.20** | **0.92** | |
| June | 1.23 | 1.26 | 1.29 | 1.34 | 1.29 | 1.34 | 1.37 | 1.31 | 1.35 | 1.31 | 1.27 | 1.34 | 1.29 | 1.25 | 1.33 | 1.19 | 1.28 | 1.33 | 1.28 | 1.25 | 1.31 | 1.35 | 1.30 | 1.27 | 1.32 | 1.29 | 1.34 | 1.27 | 1.20 | 1.36 | | **1.30** | **1.37** | **1.19** | |
| July | 1.19 | 1.23 | 1.25 | 1.19 | 1.29 | 1.51 | 1.56 | 1.48 | 1.52 | 1.58 | 1.51 | 1.47 | 1.51 | 1.63 | 1.64 | 1.58 | 1.64 | 1.55 | 1.58 | 1.35 | 1.31 | 1.35 | 1.37 | 1.31 | 1.42 | 1.49 | 1.51 | 1.47 | 1.42 | 1.53 | 1.47 | **1.45** | **1.64** | **1.19** | |
| August | 1.91 | 1.84 | 1.69 | 1.86 | 1.67 | 1.62 | 1.74 | 1.69 | 1.71 | 1.66 | 1.71 | 1.65 | 1.69 | 1.81 | 1.76 | 1.68 | 1.79 | 1.70 | 1.63 | 1.71 | 1.68 | 1.73 | 1.69 | 1.58 | 1.69 | 1.47 | 1.56 | 1.70 | 1.52 | 1.63 | | **1.69** | **1.91** | **1.47** | |
| September | 1.41 | 1.33 | 1.51 | 1.55 | 1.63 | 1.74 | 1.56 | 1.60 | 1.71 | 1.68 | 1.59 | 1.48 | 1.52 | 1.44 | 1.52 | 1.64 | 1.66 | 1.58 | 1.55 | 1.57 | 1.51 | 1.55 | 1.47 | 1.49 | 1.44 | 1.68 | 1.73 | 1.69 | 1.76 | 1.61 | | **1.57** | **1.76** | **1.33** | |
| October | 1.71 | 1.76 | 1.68 | 1.77 | 1.71 | 1.62 | 1.49 | 1.63 | 1.71 | 1.68 | 1.77 | 1.59 | 1.68 | 1.66 | 1.61 | 1.71 | 1.61 | 1.73 | 1.64 | 1.70 | 1.63 | 1.73 | 1.76 | 1.59 | 1.55 | 1.62 | 1.66 | 1.54 | 1.49 | 1.49 | 1.56 | **1.65** | **1.77** | **1.49** | |
| November | 1.65 | 1.73 | 1.69 | 1.64 | 1.49 | 1.53 | 1.60 | 1.62 | 1.58 | 1.56 | 1.62 | 1.67 | 1.71 | 1.75 | 1.56 | 1.63 | 1.39 | 1.37 | 1.41 | 1.43 | 1.64 | 1.58 | 1.63 | 1.65 | 1.61 | 1.54 | 1.56 | 1.48 | 1.39 | 1.43 | | **1.57** | **1.75** | **1.37** | |
| December | 1.47 | 1.13 | 1.07 | 0.98 | 1.01 | 0.93 | 0.98 | 0.98 | 1.00 | 0.99 | 1.01 | 1.03 | 1.05 | 0.97 | 0.99 | 0.91 | 0.95 | 0.93 | 0.94 | 0.93 | 0.99 | 0.98 | 0.95 | 1.00 | 0.99 | 0.96 | 0.94 | 0.92 | 0.89 | 0.86 | 0.87 | **0.99** | **1.47** | **0.86** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1.24** | **1.91** | **0.68** | **Yearly** |

**2016**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 0.91 | 0.97 | 0.99 | 0.94 | 0.83 | 0.83 | 0.81 | 0.85 | 0.88 | 0.77 | 0.83 | 0.71 | 0.76 | 0.81 | 0.83 | 0.87 | 0.86 | 0.82 | 0.77 | 0.69 | 0.81 | 0.93 | 0.91 | 0.90 | 0.89 | 0.92 | 0.95 | 0.89 | 0.76 | 0.83 | 0.80 | **0.85** | **0.99** | **0.69** | |
| February | 0.73 | 0.61 | 0.62 | 0.63 | 0.58 | 0.62 | 0.60 | 0.57 | 0.55 | 0.58 | 0.58 | 0.56 | 0.51 | 0.55 | 0.50 | 0.57 | 0.56 | 0.59 | 0.63 | 0.51 | 0.51 | 0.53 | 0.61 | 0.55 | 0.5 | 0.55 | 0.57 | 0.62 | 0.52 | | | **0.57** | **0.73** | **0.50** | |
| March | 0.58 | 0.61 | 0.55 | 0.51 | 0.57 | 0.55 | 0.54 | 0.51 | 0.52 | 0.61 | 0.56 | 0.54 | 0.60 | 0.61 | 0.58 | 0.62 | 0.59 | 0.57 | 0.59 | 0.58 | 0.59 | 0.61 | 0.53 | 0.57 | 0.52 | 0.55 | 0.60 | 0.51 | 0.57 | 0.53 | 0.59 | **0.57** | **0.62** | **0.51** | |
| April | 0.61 | 0.59 | 0.63 | 0.56 | 0.61 | 0.61 | 0.63 | 0.59 | 0.60 | 0.63 | 0.58 | 0.61 | 0.60 | 0.59 | 0.63 | 0.59 | 0.66 | 0.54 | 0.60 | 0.62 | 0.71 | 0.77 | 0.65 | 0.71 | 0.68 | 0.73 | 0.76 | 0.67 | 0.73 | 0.77 | | **0.64** | **0.77** | **0.54** | |
| May | 0.77 | 0.75 | 0.82 | 0.78 | 0.81 | 0.86 | 0.89 | 0.88 | 1.11 | 1.13 | 1.02 | 1.09 | 0.98 | 1.10 | 1.07 | 1.13 | 1.11 | 1.13 | 1.16 | 0.92 | 0.99 | 1.02 | 1.19 | 1.17 | 1.21 | 1.29 | 1.10 | 1.15 | 1.12 | 1.17 | 1.15 | **1.03** | **1.29** | **0.75** | |
| June | 1.23 | 1.19 | 1.22 | 1.38 | 1.27 | 1.17 | 1.23 | 1.21 | 1.17 | 1.13 | 1.16 | 1.19 | 1.21 | 1.68 | 1.51 | 1.67 | 1.73 | 1.75 | 1.69 | 1.63 | 1.57 | 1.53 | 1.47 | 1.55 | 1.59 | 1.65 | 1.68 | 1.57 | 1.63 | 1.64 | | **1.44** | **1.75** | **1.13** | |
| July | 1.50 | 1.49 | 1.58 | 1.61 | 1.63 | 1.59 | 1.49 | 1.51 | 1.55 | 1.45 | 1.53 | 1.49 | 1.26 | 1.33 | 1.38 | 1.45 | 1.45 | 1.51 | 1.43 | 1.37 | 1.43 | 1.39 | 1.45 | 1.54 | 1.58 | 1.44 | 1.37 | 1.31 | 1.45 | 1.40 | 1.49 | **1.47** | **1.63** | **1.26** | |
| August | 1.52 | 1.63 | 1.57 | 1.60 | 1.42 | 1.33 | 1.37 | 1.51 | 1.52 | 1.31 | 1.09 | 1.21 | 1.49 | 1.49 | 1.56 | 1.45 | 1.36 | 1.47 | 1.31 | 1.39 | 1.44 | 1.28 | 1.33 | 1.27 | 1.41 | 1.37 | 1.27 | 1.30 | 1.12 | 1.21 | 1.17 | **1.38** | **1.63** | **1.09** | |
| September | 1.06 | 1.21 | 1.30 | 1.19 | 1.12 | 1.17 | 1.22 | 1.33 | 1.38 | 1.41 | 1.39 | 1.26 | 1.35 | 1.22 | 1.19 | 1.31 | 1.20 | 1.27 | 1.31 | 1.21 | 1.38 | 1.26 | 1.33 | 1.39 | 1.47 | 1.35 | 1.29 | 1.42 | 1.49 | 1.37 | | **1.30** | **1.49** | **1.06** | |
| October | 1.37 | 1.39 | 1.28 | 1.31 | 1.33 | 1.23 | 1.27 | 1.21 | 1.36 | 1.29 | 1.38 | 1.32 | 1.39 | 1.41 | 1.26 | 1.19 | 1.22 | 1.27 | 1.21 | 1.30 | 1.33 | 1.35 | 1.39 | 1.31 | 1.22 | 1.91 | 1.30 | 1.21 | 1.27 | 1.33 | 1.44 | **1.32** | **1.91** | **1.19** | |
| November | 1.29 | 1.22 | 1.23 | 1.31 | 1.34 | 1.21 | 1.26 | 1.33 | 1.34 | 1.22 | 1.31 | 1.37 | 1.34 | 1.28 | 1.21 | 1.18 | 1.27 | 1.32 | 1.30 | 1.33 | 1.27 | 1.24 | 1.22 | 2.19 | 1.31 | 1.34 | 1.31 | 1.22 | 1.51 | 1.60 | | **1.33** | **2.19** | **1.18** | |
| December | 1.65 | 1.61 | 1.67 | 1.60 | 1.58 | 1.62 | 1.52 | 1.23 | 1.11 | 1.06 | 1.08 | 1.17 | 1.11 | 1.00 | 1.09 | 0.99 | 0.92 | 0.97 | 0.94 | 0.91 | 0.97 | 0.94 | 0.97 | 1.01 | 1.05 | 1.00 | 1.07 | 1.02 | 1.11 | 1.03 | 1.06 | **1.16** | **1.67** | **0.91** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1.09** | **2.19** | **0.50** | **Yearly** |

**port - Characterization of Raw Water Supply Source**

Turbidity - Range of 1.0 to 2.5 NTU.

## Source Water Assessment Data

### Temperature - Raw (ºC)

**2020**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **2** | **1** | |
| February | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | **2.0** | **2** | **2** | |
| March | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | **2.2** | **3** | **2** | |
| April | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 5 | 7 | 7 | 7 | 8 | 7 | 7 | 10 | 11 | 10 | 9 | 9 | 9 | | **5.4** | **11** | **3** | |
| May | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 9 | 8 | 9 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 13 | 13 | 13 | 13 | 12 | 13 | 12 | 12 | 11 | 11 | 12 | **10.8** | **14** | **8** | |
| June | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 21 | 22 | | **16.2** | **22** | **12** | |
| July | 22 | 23 | 24 | 26 | 25 | 25 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 22 | 22 | 22 | 21 | 21 | 21 | 21 | 20 | 22 | 22 | 21 | 22 | 22 | 22 | 21 | 21 | 22 | 23 | **22.6** | **26** | **20** | |
| August | 23 | 23 | 22 | 22 | 22 | 23 | 22 | 23 | 23 | 23 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 22 | 22 | 22 | **22.4** | **23** | **22** | |
| September | 21 | 20 | 20 | 19 | 19 | 19 | 18 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | | **16.4** | **21** | **15** | |
| October | 15 | 14 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | **10.0** | **15** | **6** | |
| November | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| December | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **11.0** | **26** | **1** | **Yearly** |

**2019**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **2** | **2** | |
| February | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | **2.0** | **2** | **2** | |
| March | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | **2.1** | **3** | **2** | |
| April | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | **4.1** | **5** | **3** | |
| May | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 7 | 8 | 8 | 8 | 8 | 9 | 10 | 10 | 10 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | **8.8** | **13** | **5** | |
| June | 13 | 13 | 13 | 13 | 13 | 13 | 15 | 15 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 17 | 18 | 18 | 19 | 20 | 18 | 16 | 16 | 18 | 20 | 16 | | **15.6** | **20** | **13** | |
| July | 20 | 19 | 19 | 20 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 22 | 23 | 22 | 22 | 23 | 23 | 21 | 21 | 21 | 22 | 21 | 22 | 22 | 21 | 22 | 22 | 22 | 22 | 23 | **21.4** | **23** | **19** | |
| August | 22 | 22 | 23 | 23 | 23 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 21 | 21 | 21 | 21 | 21 | 21 | 20 | 20 | 20 | 19 | **21.7** | **23** | **19** | |
| September | 19 | 18 | 18 | 18 | 18 | 18 | 18 | 17 | 17 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 16 | 16 | 16 | 16 | 14 | | **16.7** | **19** | **14** | |
| October | 14 | 14 | 13 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 11 | 10 | 10 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 10 | 9 | 8 | 7 | 7 | **11.0** | **14** | **7** | |
| November | 7 | 7 | 7 | 7 | 6 | 5 | 5 | 5 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | **3.3** | **7** | **2** | |
| December | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **1.8** | **2** | **1** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9.2** | **23** | **1** | **Yearly** |

**2018**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **2** | **2** | |
| February | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | **2.0** | **2** | **2** | |
| March | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **2** | **2** | |
| April | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | | **3.2** | **5** | **2** | |
| May | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 7 | 6 | 7 | 6 | 8 | 8 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 12 | 12 | 14 | 13 | 11 | 12 | 13 | 18 | 18 | | **9.3** | **18** | **5** | |
| June | 17 | 17 | 17 | 15 | 15 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 19 | 19 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | | **18.9** | **22** | **15** | |
| July | 22 | 21 | 23 | 22 | 22 | 20 | 22 | 20 | 20 | 21 | 22 | 22 | 21 | 22 | 22 | 22 | 21 | 21 | 22 | 23 | 23 | 23 | 23 | 24 | 22 | 21 | 21 | 21 | 21 | 22 | 22 | **21.7** | **24** | **20** | |
| August | 22 | 22 | 22 | 21 | 21 | 22 | 22 | 22 | 21 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 20 | 20 | 20 | 20 | **21.7** | **23** | **20** | |
| September | 20 | 21 | 20 | 20 | 20 | 20 | 19 | 20 | 20 | 20 | 19 | 19 | 19 | 20 | 19 | 20 | 20 | 19 | 19 | 19 | 18 | 12 | 11 | 14 | 15 | 15 | 14 | 14 | 13 | 13 | | **17.7** | **21** | **11** | |
| October | 13 | 12 | 13 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | **8.6** | **13** | **7** | |
| November | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | **3.7** | **7** | **2** | |
| December | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **3** | **2** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9.4** | **24** | **2** | **Yearly** |

**2017**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | **2.5** | **3** | **2** | |
| February | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | **2.7** | **3** | **2** | |
| March | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 4 | **2.4** | **4** | **2** | |
| April | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | | **4.9** | **6** | **4** | |
| May | 6 | 6 | 6 | 7 | 7 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | **9.9** | **12** | **6** | |
| June | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 16 | 19 | 19 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | | **16.2** | **19** | **13** | |
| July | 17 | 17 | 18 | 19 | 19 | 20 | 19 | 20 | 19 | 20 | 21 | 20 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 22 | 21 | 22 | 23 | 23 | 23 | 23 | **20.1** | **23** | **17** | |
| August | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 23 | 22 | 22 | 22 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | **21.5** | **23** | **20** | |
| September | 20 | 20 | 20 | 20 | 20 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 18 | 17 | 17 | 16 | 17 | 17 | 18 | 17 | 17 | 17 | 17 | 17 | 16 | 15 | 16 | 15 | | **17.7** | **20** | **15** | |
| October | 15 | 15 | 15 | 15 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 11 | 11 | 12 | 12 | 12 | 11 | 11 | 11 | 9 | 8 | 8 | 7 | 7 | **11.9** | **15** | **7** | |
| November | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | **3.6** | **7** | **2** | |
| December | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2.0** | **3** | **1** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9.6** | **23** | **1** | **Yearly** |

**2016**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | **2.1** | **3** | **2** | |
| February | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | **2.4** | **3** | **2** | |
| March | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | **3.1** | **4** | **3** | |
| April | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 6 | 6 | | **4.3** | **6** | **3** | |
| May | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 9 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 10 | 11 | 10 | 12 | 14 | 15 | 10 | 12 | 14 | 14 | 14 | 15 | 15 | 16 | **10.5** | **16** | **7** | |
| June | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 17 | 17 | 17 | 16 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 18 | 18 | 18 | 17 | 17 | 18 | | **16.8** | **19** | **15** | |
| July | 17 | 18 | 18 | 18 | 18 | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | **20.4** | **23** | **17** | |
| August | 23 | 23 | 23 | 23 | 22 | 22 | 23 | 23 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 22 | 22 | 21 | 21 | **22.2** | **23** | **21** | |
| September | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 20 | 20 | 20 | 19 | 19 | 19 | 19 | 19 | 18 | 18 | 17 | 17 | 17 | 17 | 17 | 17 | 16 | 16 | 16 | 15 | | **18.9** | **21** | **15** | |
| October | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 14 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | **12.2** | **15** | **10** | |
| November | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | | **6.7** | **9** | **4** | |
| December | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | **2.7** | **4** | **2** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **10.2** | **23** | **2** | **Yearly** |

## Source Water Assessment Data

### pH - Raw

**2020**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 6.97 | 6.93 | 6.96 | 6.95 | 6.91 | 6.93 | 7.03 | 6.97 | 7.08 | 7.02 | 6.91 | 6.93 | 7.03 | 6.96 | 7.16 | 7.08 | 7.14 | 6.90 | 6.93 | 6.98 | 6.90 | 6.89 | 6.89 | 6.87 | 6.86 | 6.89 | 6.88 | 6.86 | 6.79 | 6.86 | 6.85 | **6.95** | **7.16** | **6.79** |
| February | 6.78 | 6.75 | 6.83 | 6.93 | 7.04 | 7.01 | 7.10 | 6.93 | 6.92 | 6.91 | 6.88 | 6.88 | 6.88 | 6.88 | 6.87 | 6.77 | 6.72 | 6.93 | 6.92 | 6.96 | 6.85 | 6.92 | 6.87 | 6.94 | 6.73 | 6.64 | 6.67 | 6.72 | 6.77 | | | **6.86** | **7.10** | **6.64** |
| March | 6.89 | 6.93 | 6.90 | 6.88 | 7.07 | 6.87 | 6.88 | 6.92 | 6.82 | 7.01 | 6.86 | 7.03 | 6.95 | 6.94 | 6.89 | 6.86 | 6.65 | 6.70 | 6.72 | 6.58 | 6.72 | 6.74 | 6.77 | 6.74 | 6.82 | 6.76 | 6.75 | 6.79 | 6.75 | 6.88 | 6.95 | **6.84** | **7.07** | **6.58** |
| April | 6.91 | 6.99 | 7.01 | 7.00 | 7.01 | 7.00 | 7.02 | 7.00 | 6.99 | 6.98 | 7.01 | 7.00 | 7.01 | 6.77 | 6.74 | 6.73 | 6.73 | 6.73 | 6.80 | 6.71 | 6.61 | 6.59 | 6.61 | 6.84 | 6.65 | 6.75 | 6.82 | 6.83 | 6.78 | 7.09 | | **6.86** | **7.09** | **6.59** |
| May | 6.85 | 6.80 | 6.88 | 6.79 | 6.70 | 6.75 | 6.78 | 6.77 | 6.75 | 6.77 | 6.68 | 6.66 | 6.71 | 6.70 | 6.73 | 6.79 | 6.83 | 6.80 | 6.78 | 6.78 | 6.79 | 6.77 | 6.77 | 6.73 | 6.73 | 6.66 | 6.71 | 6.69 | 6.66 | 6.70 | 6.73 | **6.75** | **6.88** | **6.66** |
| June | 6.71 | 6.86 | 6.71 | 6.99 | 6.99 | 6.93 | 6.83 | 6.84 | 6.76 | 6.73 | 6.74 | 6.73 | 6.79 | 6.85 | 6.81 | 6.85 | 6.81 | 6.77 | 6.71 | 6.81 | 6.76 | 6.71 | 6.89 | 6.83 | 6.93 | 6.77 | 6.91 | 6.92 | 6.80 | 6.95 | | **6.82** | **6.99** | **6.71** |
| July | 6.79 | 6.78 | 6.88 | 6.80 | 6.79 | 6.77 | 6.86 | 6.75 | 6.75 | 6.79 | 6.83 | 6.83 | 6.76 | 6.75 | 6.71 | 6.79 | 6.81 | 6.88 | 6.91 | 6.99 | 6.78 | 6.92 | 6.86 | 6.87 | 6.90 | 6.93 | 6.87 | 6.77 | 6.86 | 6.87 | 6.89 | **6.83** | **6.99** | **6.71** |
| August | 6.89 | 6.88 | 6.89 | 7.04 | 6.89 | 7.02 | 7.01 | 7.12 | 6.85 | 7.11 | 6.90 | 6.91 | 6.93 | 6.92 | 7.02 | 6.97 | 6.98 | 7.00 | 7.12 | 7.09 | 7.01 | 7.07 | 7.00 | 7.01 | 7.03 | 7.03 | 7.03 | 7.01 | 6.98 | 7.01 | 7.00 | **6.99** | **7.12** | **6.85** |
| September | 7.06 | 6.93 | 6.95 | 6.99 | 6.97 | 7.04 | 7.00 | 7.24 | 7.39 | 7.25 | 7.27 | 7.30 | 7.31 | 7.25 | 7.46 | 7.38 | 7.33 | 7.54 | 7.44 | 7.32 | 7.49 | 7.16 | 7.24 | 7.57 | 7.28 | 7.29 | 7.41 | 7.48 | 7.36 | 7.02 | | **7.26** | **7.57** | **6.93** |
| October | 7.01 | 6.99 | 6.96 | 7.09 | 7.03 | 6.90 | 7.36 | 7.20 | 7.43 | 7.34 | 7.33 | 7.40 | 7.54 | 7.54 | 7.53 | 7.50 | 7.51 | 7.53 | 7.55 | 7.60 | 7.73 | 7.53 | 7.28 | 7.23 | 7.58 | 7.32 | 7.47 | 7.49 | 7.18 | 7.19 | 7.09 | **7.34** | **7.73** | **6.90** |
| November | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| December | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **6.95** | **7.73** | **6.58** |

**Yearly**

**2019**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 7.17 | 7.19 | 7.21 | 7.14 | 7.24 | 7.18 | 7.23 | 7.24 | 7.17 | 7.19 | 7.18 | 6.93 | 6.91 | 7.25 | 7.45 | 7.43 | 7.26 | 7.26 | 7.09 | 7.00 | 7.26 | 7.20 | 7.20 | 7.15 | 7.10 | 7.17 | 7.12 | 7.12 | 7.12 | 7.15 | 7.14 | **7.18** | **7.45** | **6.91** |
| February | 7.08 | 7.16 | 7.06 | 6.99 | 7.06 | 7.01 | 7.02 | 7.00 | 7.12 | 7.10 | 7.01 | 7.03 | 7.04 | 6.97 | 7.00 | 7.00 | 6.98 | 6.97 | 6.95 | 7.04 | 7.08 | 7.12 | 7.11 | 7.02 | 6.97 | 6.93 | 6.95 | 6.97 | | | | **7.03** | **7.16** | **6.93** |
| March | 7.06 | 7.00 | 7.07 | 6.98 | 7.01 | 7.05 | 7.03 | 7.01 | 7.00 | 6.99 | 7.03 | 6.97 | 6.99 | 7.05 | 7.01 | 7.00 | 7.01 | 7.08 | 6.91 | 6.93 | 7.07 | 7.01 | 7.04 | 7.01 | 7.07 | 7.03 | | 7.05 | 7.07 | 7.01 | 6.99 | **7.02** | **7.08** | **6.91** |
| April | 7.04 | 6.94 | 6.99 | 6.98 | 6.96 | 6.99 | 6.99 | 6.99 | 7.07 | 7.04 | 7.03 | 7.07 | 7.10 | 7.09 | 6.96 | 6.99 | 7.02 | 7.05 | 7.01 | 6.95 | 6.96 | 6.97 | 7.01 | 6.92 | 6.95 | 6.95 | 6.98 | 6.99 | 6.96 | 6.97 | | **7.00** | **7.10** | **6.92** |
| May | 6.91 | 6.99 | 6.93 | 6.97 | 6.95 | 6.84 | 6.92 | 6.90 | 6.94 | 6.99 | 6.98 | 7.01 | 7.02 | 7.00 | 7.01 | 7.03 | 7.00 | 7.03 | 7.07 | 7.11 | 7.04 | 7.10 | 7.11 | 7.06 | 7.13 | 7.10 | 7.09 | 7.11 | 7.09 | 7.24 | 7.39 | **7.03** | **7.39** | **6.84** |
| June | 7.41 | 7.39 | 7.23 | 7.24 | 7.32 | 7.25 | 7.35 | 7.30 | 7.17 | 7.23 | 7.27 | 7.24 | 7.27 | 7.20 | 7.21 | 7.17 | 7.07 | 7.27 | 7.33 | 7.38 | 7.38 | 7.36 | 7.33 | 7.24 | 7.20 | 6.93 | 7.06 | 7.09 | 7.20 | 7.27 | | **7.25** | **7.41** | **6.93** |
| July | 7.10 | 7.02 | 7.10 | 7.22 | 7.19 | 7.17 | 7.10 | 7.19 | 7.13 | 7.16 | 7.12 | 7.07 | 7.19 | 7.25 | 7.10 | 7.24 | 7.36 | 7.46 | 7.20 | 7.22 | 7.31 | 7.43 | 7.03 | 7.09 | 7.07 | 7.28 | 7.06 | 6.97 | 7.32 | 7.09 | 7.14 | **7.17** | **7.46** | **6.97** |
| August | 7.10 | 7.02 | 7.10 | 7.22 | 7.19 | 7.17 | 7.10 | 7.19 | 7.13 | 7.16 | 7.12 | 7.07 | 7.19 | 7.25 | 7.10 | 7.24 | 7.36 | 7.46 | 7.20 | 7.22 | 7.31 | 7.43 | 7.03 | 7.09 | 7.07 | 7.28 | 7.06 | 6.97 | 7.32 | 7.09 | 7.14 | **7.17** | **7.46** | **6.97** |
| September | 7.09 | 7.09 | 6.99 | 6.97 | 7.14 | 7.14 | 7.14 | 7.16 | 7.41 | 7.21 | 7.11 | 7.14 | 7.19 | 7.08 | 7.39 | 7.15 | 7.17 | 7.18 | 7.15 | 7.11 | 7.08 | 7.20 | 7.16 | 7.15 | 7.18 | 7.13 | 7.17 | 7.17 | 7.18 | 7.08 | | **7.15** | **7.41** | **6.97** |
| October | 7.34 | 7.38 | 7.38 | 7.37 | 7.34 | 7.36 | 7.20 | 7.31 | 7.24 | 7.27 | 7.30 | 7.22 | 7.26 | 7.14 | 7.19 | 7.18 | 7.19 | 7.19 | 7.19 | 7.20 | 7.35 | 7.30 | 7.28 | 7.16 | 7.19 | 7.19 | 7.18 | 7.19 | 7.04 | 7.06 | 6.96 | **7.23** | **7.38** | **6.96** |
| November | 7.02 | 7.19 | 7.02 | 7.00 | 7.17 | 7.14 | 7.21 | 7.19 | 7.21 | 7.19 | 7.18 | 7.31 | 7.40 | 7.39 | 7.39 | 7.35 | 7.33 | 7.26 | 7.29 | 7.27 | 7.29 | 7.28 | 7.38 | 7.27 | 7.30 | 7.17 | 7.29 | 7.21 | 7.17 | 7.23 | | **7.24** | **7.40** | **7.00** |
| December | 7.21 | 7.23 | 7.28 | 7.25 | 7.22 | 7.30 | 7.23 | 7.27 | 7.31 | 7.30 | 7.36 | 7.24 | 7.30 | 7.15 | 7.12 | 7.22 | 7.07 | 7.16 | 7.01 | 7.12 | 6.99 | 6.96 | 6.96 | 6.97 | 6.89 | 6.85 | 7.06 | 6.94 | 6.94 | 6.93 | 6.92 | **7.12** | **7.36** | **6.85** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **7.13** | **7.46** | **6.84** |

**Yearly**

**2018**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 7.06 | 7.08 | 7.05 | 7.01 | 7.07 | 7.00 | 7.00 | 6.97 | 7.10 | 7.01 | 6.89 | 7.01 | 6.91 | 6.98 | 6.92 | 6.95 | 6.87 | 6.87 | 6.84 | 6.90 | 6.92 | 6.86 | 6.91 | 6.89 | 6.86 | 6.89 | 6.81 | 6.88 | 6.94 | 6.94 | 6.95 | **6.95** | **7.10** | **6.81** |
| February | 6.93 | 6.97 | 6.91 | 6.93 | 6.91 | 6.93 | 6.94 | 7.10 | 7.07 | 7.10 | 7.01 | 7.06 | 7.10 | 7.14 | 7.20 | 7.15 | 7.19 | 7.10 | 7.11 | 6.91 | 6.93 | 6.94 | 6.93 | 6.90 | 6.94 | 6.95 | 6.91 | 6.91 | | | | **7.01** | **7.20** | **6.90** |
| March | 6.99 | 6.96 | 6.92 | 6.92 | 6.93 | 6.97 | 6.94 | 6.96 | 6.98 | 7.01 | 7.09 | 6.92 | 6.93 | 6.97 | 6.94 | 6.98 | 6.96 | 7.00 | 6.99 | 7.06 | 7.02 | 6.96 | 6.99 | 7.03 | 7.00 | 6.96 | 7.08 | 6.94 | 6.99 | 7.01 | 7.05 | **6.98** | **7.09** | **6.92** |
| April | 7.00 | 6.82 | 6.95 | 6.95 | 6.90 | 6.93 | 6.97 | 6.94 | 6.93 | 7.03 | 7.05 | 6.99 | 6.96 | 6.91 | 6.97 | 7.00 | 6.92 | 6.91 | 6.95 | 6.98 | 7.00 | 7.07 | 7.01 | 7.04 | 7.00 | 7.04 | 7.02 | 7.00 | 6.88 | 6.88 | | **6.97** | **7.07** | **6.82** |
| May | 6.87 | 6.95 | 6.88 | 6.90 | 6.94 | 7.00 | 6.93 | 6.89 | 6.96 | 6.99 | 6.99 | 6.99 | 7.10 | 6.97 | 6.96 | 6.97 | 6.93 | 6.98 | 7.01 | 7.00 | 6.98 | 7.01 | 6.95 | 6.98 | 6.94 | 6.96 | 6.92 | 6.94 | 6.97 | 6.96 | | **6.96** | **7.10** | **6.87** |
| June | 6.98 | 7.01 | 7.05 | 6.92 | 6.95 | 6.99 | 6.94 | 6.92 | 6.98 | 6.95 | 7.08 | 6.98 | 6.95 | 6.91 | 6.97 | 6.99 | 6.96 | 6.96 | 6.99 | 7.05 | 7.10 | 7.12 | 7.07 | 7.12 | 7.07 | 6.97 | 6.96 | 6.91 | 7.00 | 6.91 | | **6.99** | **7.12** | **6.91** |
| July | 6.94 | 6.89 | 6.92 | 6.98 | 6.96 | 6.94 | 6.98 | 7.02 | 7.00 | 7.10 | 7.07 | 7.12 | 7.17 | 7.21 | 7.07 | 7.00 | 6.87 | 6.95 | 6.95 | 7.00 | 6.98 | 7.04 | 6.91 | 6.87 | 6.85 | 6.86 | 6.93 | 6.97 | 6.96 | 6.92 | 6.99 | **6.98** | **7.21** | **6.85** |
| August | 7.01 | 7.07 | 7.00 | 6.92 | 6.99 | 7.00 | 7.02 | 6.97 | 6.91 | 6.95 | 7.01 | 6.97 | 6.93 | 6.98 | 6.95 | 6.94 | 6.82 | 6.87 | 6.91 | 6.85 | 6.82 | 6.86 | 6.91 | 6.81 | 7.00 | 7.00 | 6.96 | 6.98 | 7.00 | 7.03 | 7.05 | **6.95** | **7.07** | **6.81** |
| September | 7.03 | 7.03 | 7.03 | 7.06 | 7.09 | 7.13 | 7.09 | 7.07 | 7.06 | 7.08 | 7.21 | 7.18 | 7.23 | 7.15 | 7.07 | 7.08 | 7.11 | 7.13 | 7.06 | 7.11 | 7.18 | 7.18 | 7.19 | 7.17 | 7.15 | 7.11 | 7.19 | 7.08 | 7.11 | 7.09 | | **7.12** | **7.23** | **7.03** |
| October | 7.11 | 7.18 | 7.20 | 7.16 | 7.21 | 7.09 | 7.00 | 7.04 | 7.21 | 7.14 | 7.22 | 7.06 | 7.16 | 7.16 | 7.17 | 7.17 | 7.15 | 7.09 | 7.11 | 7.09 | 7.01 | 7.89 | 7.16 | 7.06 | 7.09 | 7.11 | 7.06 | 7.12 | 7.07 | 7.12 | 7.03 | **7.14** | **7.89** | **7.00** |
| November | 7.01 | 7.04 | 6.92 | 7.06 | 7.01 | 7.09 | 7.11 | 7.06 | 7.07 | 7.07 | 7.14 | 7.12 | 7.07 | 6.98 | 7.04 | 7.09 | 7.12 | 7.01 | 7.10 | 7.00 | 6.98 | 7.01 | 6.97 | 6.90 | 7.09 | 7.02 | 7.06 | 7.03 | 7.01 | 7.07 | | **7.04** | **7.14** | **6.90** |
| December | 7.04 | 7.06 | 7.03 | 7.07 | 7.02 | 7.01 | 7.07 | 7.04 | 7.02 | 7.03 | 7.05 | 7.07 | 7.03 | 7.13 | 7.06 | 7.03 | 7.11 | 7.10 | 7.06 | 7.09 | 7.02 | 7.07 | 7.04 | 7.00 | 7.01 | 7.10 | 7.10 | 7.15 | 7.10 | 7.07 | 7.11 | **7.06** | **7.15** | **7.00** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **7.01** | **7.89** | **6.81** |

**Yearly**

**2017**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 7.24 | 7.23 | 7.26 | 7.21 | 7.19 | 7.16 | 7.20 | 7.24 | 7.26 | 7.28 | 7.27 | 7.25 | 7.26 | 7.19 | 7.15 | 7.23 | 7.25 | 7.26 | 7.23 | 7.21 | 7.23 | 7.21 | 7.21 | 7.26 | 7.20 | 7.29 | 7.24 | 7.22 | 7.20 | 7.20 | 7.26 | **7.23** | **7.29** | **7.15** |
| February | 7.22 | 7.32 | 7.25 | 7.19 | 7.15 | 7.19 | 7.21 | 7.03 | 7.10 | 7.02 | 7.03 | 7.10 | 7.10 | 7.13 | 7.14 | 7.21 | 7.15 | 7.20 | 7.16 | 7.19 | 7.12 | 7.09 | 7.12 | 7.19 | 7.12 | 7.15 | 7.19 | 7.22 | | | | **7.15** | **7.32** | **7.02** |
| March | 7.20 | 7.20 | 7.15 | 7.15 | 7.10 | 7.22 | 7.15 | 7.17 | 7.19 | 7.16 | 7.19 | 7.14 | 7.10 | 7.17 | 7.06 | 7.12 | 7.10 | 7.15 | 7.10 | 7.13 | 7.15 | 7.16 | 7.17 | 7.15 | 7.15 | 7.17 | 7.21 | 7.14 | 7.12 | 7.12 | 7.19 | **7.15** | **7.22** | **7.06** |
| April | 7.14 | 7.19 | 7.12 | 7.16 | 7.18 | 7.17 | 7.14 | 7.22 | 7.15 | 7.17 | 7.26 | 7.21 | 7.19 | 7.2 | 7.17 | 7.18 | 7.23 | 7.21 | 7.19 | 7.19 | 7.20 | 7.16 | 7.14 | 7.21 | 7.23 | 7.23 | 7.15 | 7.10 | 7.11 | 7.19 | | **7.18** | **7.26** | **7.10** |
| May | 7.20 | 7.28 | 7.24 | 7.25 | 7.23 | 7.19 | 7.12 | 7.20 | 7.19 | 7.19 | 7.05 | 7.08 | 7.06 | 7.09 | 7.17 | 7.19 | 7.12 | 7.14 | 7.14 | 7.10 | 7.12 | 7.21 | 7.23 | 7.14 | 7.16 | 7.19 | 7.40 | 7.52 | 7.41 | 7.38 | 7.38 | **7.21** | **7.52** | **7.05** |
| June | 7.41 | 7.39 | 7.26 | 7.24 | 7.37 | 7.42 | 7.44 | 7.40 | 7.28 | 7.20 | 7.12 | 7.16 | 7.31 | 7.19 | 7.21 | 7.30 | 7.21 | 7.23 | 7.26 | 7.32 | 7.29 | 7.26 | 7.22 | 7.18 | 7.24 | 7.51 | 7.50 | 7.44 | 7.47 | 7.36 | | **7.31** | **7.51** | **7.12** |
| July | 7.17 | 7.12 | 7.09 | 7.13 | 7.47 | 7.39 | 7.37 | 7.48 | 7.34 | 7.30 | 7.32 | 7.33 | 7.31 | 7.32 | 7.29 | 7.26 | 7.31 | 7.22 | 7.19 | 7.22 | 7.29 | 7.17 | 7.15 | 7.12 | 7.10 | 7.30 | 7.25 | 7.33 | 7.36 | 7.30 | 7.13 | **7.26** | **7.48** | **7.09** |
| August | 7.16 | 7.20 | 7.27 | 7.24 | 7.20 | 7.26 | 7.29 | 7.17 | 7.19 | 7.29 | 7.21 | 7.17 | 7.19 | 7.22 | 7.13 | 7.11 | 7.26 | 7.21 | 7.25 | 7.20 | 7.21 | 7.25 | 7.21 | 7.25 | 7.27 | 7.29 | 7.30 | 7.31 | 7.30 | 7.32 | 7.35 | **7.23** | **7.35** | **7.11** |
| September | 7.11 | 7.21 | 7.19 | 7.25 | 7.09 | 7.17 | 7.20 | 7.16 | 7.17 | 7.17 | 7.07 | 7.02 | 7.11 | 7.14 | 7.16 | 7.18 | 7.16 | 7.19 | 7.11 | 7.19 | 7.17 | 7.07 | 7.00 | 7.10 | 7.11 | 6.88 | 6.85 | 6.76 | 6.91 | 6.77 | | **7.09** | **7.25** | **6.76** |
| October | 6.82 | 6.76 | 6.80 | 6.77 | 6.88 | 6.78 | 6.94 | 6.86 | 6.92 | 6.96 | 6.89 | 6.83 | 6.80 | 6.77 | 6.91 | 6.88 | 6.94 | 6.99 | 6.92 | 6.96 | 6.90 | 6.87 | 6.90 | 7.00 | 6.99 | 6.93 | 6.96 | 6.91 | 6.94 | 6.91 | 7.00 | **6.89** | **7.00** | **6.76** |
| November | 7.02 | 7.06 | 7.11 | 7.09 | 7.06 | 7.03 | 6.90 | 6.99 | 7.01 | 7.13 | 7.01 | 7.03 | 7.01 | 7.04 | 7.06 | 7.05 | 7.03 | 7.10 | 7.11 | 7.07 | 7.05 | 7.04 | 7.04 | 7.11 | 7.01 | 7.09 | 7.16 | 7.15 | 7.14 | 7.11 | | **7.06** | **7.16** | **6.90** |
| December | 7.32 | 7.22 | 7.11 | 7.09 | 7.33 | 7.09 | 7.12 | 7.09 | 7.07 | 7.11 | 7.14 | 7.02 | 7.01 | 7.01 | 7.10 | 7.07 | 7.10 | 7.17 | 7.14 | 7.17 | 7.18 | 7.14 | 7.07 | 7.11 | 7.11 | 7.09 | 7.11 | 7.16 | 7.10 | 7.10 | 7.04 | **7.12** | **7.33** | **7.01** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **7.16** | **7.52** | **6.76** |

**Yearly**

**2016**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Average | Monthly Maximum | Monthly Minimum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 7.07 | 7.00 | 7.10 | 7.07 | 6.90 | 7.08 | 7.07 | 7.16 | 7.19 | 7.25 | 7.23 | 7.20 | 7.21 | 7.19 | 7.15 | 7.16 | 7.11 | 7.18 | 7.09 | 7.06 | 7.22 | 7.16 | 7.01 | 7.07 | 7.01 | 7.08 | 7.18 | 7.05 | 7.27 | 7.33 | 7.44 | **7.14** | **7.44** | **6.90** |
| February | 7.43 | 7.42 | 7.46 | 7.16 | 7.12 | 7.09 | 7.05 | 7.09 | 7.16 | 7.17 | 7.15 | 7.13 | 7.10 | 7.05 | 7.10 | 7.08 | 7.18 | 7.10 | 7.13 | 7.12 | 7.11 | 7.10 | 7.17 | 7.12 | 7.06 | 7.16 | 7.12 | 7.09 | 7.10 | | | **7.15** | **7.46** | **7.05** |
| March | 7.13 | 7.14 | 7.10 | 6.99 | 7.06 | 7.03 | 6.95 | 7.11 | 6.91 | 6.93 | 7.19 | 7.40 | 7.34 | 7.26 | 7.35 | 7.17 | 7.17 | 7.20 | 7.18 | 7.22 | 7.25 | 7.12 | 7.11 | 7.23 | 7.17 | 7.15 | 7.17 | 7.30 | 7.31 | 7.16 | 7.20 | **7.16** | **7.40** | **6.91** |
| April | 7.17 | 7.25 | 7.20 | 7.36 | 7.40 | 7.38 | 7.32 | 7.39 | 7.30 | 7.26 | 7.35 | 7.33 | 7.50 | 7.44 | 7.41 | 7.31 | 7.20 | 7.42 | 7.42 | 7.42 | 7.43 | 7.38 | 7.42 | 7.33 | 7.44 | 7.44 | 7.25 | 7.41 | 7.35 | 7.31 | | **7.35** | **7.50** | **7.17** |
| May | 7.29 | 7.44 | 7.42 | 7.41 | 7.42 | 7.41 | 7.40 | 7.45 | 7.49 | 7.42 | 7.45 | 7.43 | 7.47 | 7.49 | 7.47 | 7.47 | 7.47 | 7.43 | 7.46 | 7.49 | 7.41 | 7.40 | 7.33 | 7.45 | 7.44 | 7.17 | 7.26 | 7.19 | 7.21 | 7.16 | 7.15 | **7.39** | **7.49** | **7.15** |
| June | 7.14 | 7.08 | 7.19 | 7.26 | 7.25 | 7.24 | 7.21 | 7.25 | 7.23 | 7.28 | 7.27 | 7.29 | 7.26 | 7.19 | 7.11 | 7.11 | 7.05 | 7.09 | 7.12 | 7.01 | 7.07 | 7.10 | 7.14 | 7.11 | 7.04 | 7.05 | 7.01 | 7.16 | 7.18 | 7.20 | | **7.16** | **7.29** | **7.01** |
| July | 7.16 | 7.11 | 7.17 | 7.11 | 7.15 | 7.20 | 7.16 | 7.21 | 7.09 | 7.17 | 7.12 | 7.18 | 7.10 | 7.07 | 7.23 | 7.13 | 7.21 | 7.19 | 6.98 | 7.26 | 7.24 | 7.20 | 7.19 | 7.11 | 7.19 | 7.16 | 7.19 | 7.09 | 7.21 | 7.17 | 7.16 | **7.16** | **7.26** | **6.98** |
| August | 7.19 | 7.09 | 7.15 | 7.21 | 7.22 | 7.26 | 7.31 | 7.32 | 7.25 | 7.29 | 7.33 | 7.08 | 7.19 | 7.16 | 7.20 | 7.11 | 7.19 | 7.19 | 7.10 | 7.09 | 7.16 | 7.20 | 6.99 | 7.07 | 7.09 | 7.01 | 7.17 | 7.05 | 7.10 | 7.09 | 6.94 | **7.15** | **7.33** | **6.94** |
| September | 7.13 | 7.10 | 7.21 | 7.15 | 7.21 | 7.06 | 7.04 | 7.03 | 7.16 | 7.1 | 7.12 | 7.12 | 7.09 | 7.13 | 7.11 | 7.10 | 7.10 | 7.07 | 7.04 | 7.10 | 7.06 | 7.19 | 7.07 | 7.12 | 7.11 | 7.03 | 7.07 | 6.96 | 7.09 | 7.01 | | **7.10** | **7.21** | **6.96** |
| October | 7.01 | 7.09 | 7.12 | 7.05 | 7.03 | 7.05 | 7.05 | 7.10 | 7.01 | 7.07 | 7.01 | 7.04 | 7.08 | 7.07 | 7.05 | 7.01 | 7.07 | 7.03 | 7.07 | 7.12 | 6.99 | 7.01 | 7.05 | 7.07 | 7.09 | 7.19 | 7.07 | 7.13 | 7.10 | 7.10 | 7.10 | **7.07** | **7.19** | **6.99** |
| November | 7.08 | 7.11 | 7.10 | 7.09 | 7.12 | 7.09 | 7.14 | 7.13 | 7.11 | 7.13 | 7.10 | 7.08 | 7.13 | 7.14 | 7.12 | 7.08 | 7.14 | 7.17 | 7.21 | 7.12 | 7.12 | 7.35 | 7.13 | 7.18 | 7.11 | 7.14 | 7.11 | 7.09 | 7.20 | 7.24 | | **7.14** | **7.35** | **7.08** |
| December | 7.21 | 7.17 | 7.12 | 7.22 | 7.22 | 7.17 | 7.20 | 7.25 | 7.27 | 7.31 | 7.28 | 7.29 | 7.28 | 7.30 | 7.18 | 7.24 | 7.26 | 7.27 | 7.22 | 7.19 | 7.23 | 7.15 | 7.24 | 7.19 | 7.27 | 7.29 | 7.21 | 7.20 | 7.23 | 7.12 | 7.24 | **7.23** | **7.31** | **7.12** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **7.18** | **7.50** | **6.90** |

**Yearly**

**Ministry of the Environment, Conservation and Parks**

Drinking Water and Environmental Compliance Division, Northern Region
Thunder Bay District, Kenora Office
808 Robertson Street
Kenora, ON P9N 1X9
Tel.: 807 468-2718
Fax: 807 468-2735

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Division de la conformité en matière d'eau potable et d'environnement, Direction régionale du Nord
District de Thunder Bay, Bureau de Kenora
808 rue Robertson
Kenora, ON P9N 1X9
Tel. : 807 468-2718
Téléc.: 807 468-2735

February 24, 2021

Town of Fort Frances
320 Portage Ave.
Fort Frances, ON
P9A 3P9

Attention: Craig Miller, Environmental and Facilities Superintendent

Dear Mr. Miller:

**Re: Fort Frances Water Treatment Plant Inspection Report (2019/2020)**

Please find attached the 2020/2021 municipal water works inspection report. The announced detailed inspection review period covered the period of time from January 16, 2020 to January 8, 2021. The time and co-operation of all operators involved was greatly appreciated.

Four non-compliance issues were identified during the inspection. Actions required to address each of these non-compliance issues are included on pages 17 through 18 of the inspection report. Please note that "Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licenses, permits, orders, or instructions. Such violations could result in the issuance of mandatory abatement instruments including Orders, tickets, penalties, or referrals to the ministry's Investigations and Enforcement Branch.

Best practice issues and associated recommendations, for the continued improvement of operations of the Fort Frances drinking-water system, are provided on page 19 of the inspection report. *"Recommended Actions"* convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the fulsome availability of information to consumers, and conformance with existing and emerging industrial standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles on the Inspection, Investigation & Enforcement (II&E) Secretariat and advice in internal/external risk experts. The Inspection

Summary Rating Record (IRR), included as Appendix B of the inspection report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Paula Spencer, Drinking Water Program Supervisor, at (807) 627-7632.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councilors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in *"Taking Care of Your Drinking Water: A guide for members of municipal council"* found under "Resources" on the Drinking Water Ontario website at www.ontario.ca/drinkingwater.

If you have any questions or comments in regards to this inspection, or if you would like to discuss Ontario's drinking water legislation, please contact Carolyn Lacroix at (807) 707-6346.

Sincerely,

CLacroix

Ministry of the Environment, Conservation and Parks
Thunder Bay District, Kenora Office

CL/cl

cc. Northwestern Health Unit
21 Wolsley Street
Kenora, Ontario
P9N 3W7
**Attention**: Thomas Nabb, Program Manager

cc. Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, Ontario
P9A 6S7
**Attention**: Greg Chapman, District Manager

cc. Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, Ontario
P9N 1X9
**Attention**: Paula Spencer, Water Supervisor

cc. Thunder Bay District, Kenora Office
File Number: DK DY WI – 540

Ontario

**Ministry of the Environment, Conservation and Parks**

# FORT FRANCES DRINKING WATER SYSTEM

## Inspection Report

| | |
|---|---|
| **Site Number:** | 220000978 |
| **Inspection Number:** | 1-O99X1 |
| **Date of Inspection:** | Jan 08, 2021 |
| **Inspected By:** | Carolyn Lacroix |

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## OWNER INFORMATION:

**Company Name:** FORT FRANCES, THE CORPORATION OF THE TOWN OF
**Street Number:** 320 **Unit Identifier:**
**Street Name:** PORTAGE Ave
**City:** FORT FRANCES
**Province:** ON **Postal Code:** P9A 3P9

### CONTACT INFORMATION

## INSPECTION DETAILS:

**Site Name:** FORT FRANCES DRINKING WATER SYSTEM
**Site Address:** 901 COLONIZATION Road East FORT FRANCES ON P9A 3P9
**County/District:** FORT FRANCES
**MECP District/Area Office:** Kenora Area Office
**Health Unit:** NORTHWESTERN HEALTH UNIT
**Conservation Authority:**
**MNR Office:** Fort Frances District Office
**Category:** Large Municipal Residential
**Site Number:** 220000978
**Inspection Type:** Announced
**Inspection Number:** 1-O99X1
**Date of Inspection:** Jan 08, 2021
**Date of Previous Inspection:** Jan 16, 2020

### COMPONENTS DESCRIPTION

**Site (Name):** MOE DWS Mapping
**Type:** DWS Mapping Point **Sub Type:**

**Site (Name):** SOURCE
**Type:** Source **Sub Type:** Surface
**Comments:**
The raw water supply for the Fort Frances municipal drinking water system is taken from the Rainy River at the outflow of Rainy Lake. The source water is generally of good quality, however it can be subject to elevated levels of colour, turbidity, and dissolved organic carbon.
Source water is gravity-fed into a low-lift pump well located within the plant. It is then drawn through a 630 mm diameter, 190 m long intake line that is equipped at the terminal end with a stainless steel screen. Coarse material is screened at the initial intake point and again through a set of screens within the raw water well.

**Site (Name):** TREATED WATER
**Type:** Treated Water POE **Sub Type:** Pumphouse
**Comments:**
Three (3) vertical turbine low lift pumps deliver raw water through a common header equipped with alum and soda ash injection points, an in-line mixer, and a flow meter. Alum is added at all times when water is being produced;

soda ash is added only when needed based on the pH of the raw water supply. Polymer is then injected as the water passes into two solids contact clarifiers. The clarifiers are equipped with blow-down devices to remove excess sludge, which is discharged to the municipal sanitary sewer. Clarified water passes through one of four dual media (anthracite coal/sand) filters. Each filter effluent line is monitored for pH and turbidity. Water is disinfected in a baffled contact chamber by the addition of chlorine gas. Soda ash, used for pH adjustment is added to the clearwell, as well as hydrofluosilicic acid. Treated water flows are measured using an in-line flow meter.
Four high lift pumps (rated at 63.1 L/s (2), 94.7 L/s and 126.2 L/s) pressurize treated water as it is directed to the distribution system. Distribution system pressure is also maintained by the elevated storage tank located in the southwest portion of Fort Frances.
A complete description of the treatment system can be found in Drinking Water Works Permit No. 224-201.

**Site (Name):** DISTRIBUTION (WATER INSPECTION)
**Type:** Other **Sub Type:** Other
**Comments:**
The Fort Frances distribution system services a population of approximately 8,000 in Town, another 300 people in the neighbouring community of Couchiching First Nation and has one connection to a property in the neighbouring Alberton Township. The distribution system is comprised of ductile steel, cast iron, and PVC piping. The original system was installed in the early 1900's. As older pipes are replaced, PVC piping comprises an increasing proportion of the works. Some sections of the distribution system have been looped at the recommendation of a consulting engineer, however several dead ends still remain. The distribution system is 70.73 kilometres in length and contains 399 fire hydrants.
A 4,500 cubic meter elevated storage tower is located in the southwest portion of the town. A telemetry system is used to maintain water levels in the tower. A paced-to-flow chlorination system injects liquid calcium hypochlorite at the outflow from the storage tower to maintain adequate chlorine residuals in the distribution system.

# INSPECTION SUMMARY:

## Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.**

  **This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.**

  **This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.**

  This detailed, announced inspection was initiated on January 13, 2021, by Ministry of the Environment, Conservation & Parks (MECP) water inspector, Carolyn Lacroix. The inspection review period is the period of time from the date of the previous MECP inspection conducted on January 16, 2020 to January 8, 2021.
  Due to the circumstances surrounding the COVID-19 global pandemic, the majority of this inspection was completed remotely through email and data sharing. The field portion of the inspection was conducted on February 10, 2021 and was limited to a tour of the water treatment plant (WTP), continuous data review and gathering remaining inspection information.
  Text highlighted in bold-type is computer-generated based on yes/no responses to standard questions answered during the inspection. Supporting information, in regular font, has been added by the undersigned water inspector to qualify standard responses and to provide additional guidance/information.

## Source

- **Trends in source water quality were being monitored.**

  The following raw water parameters are documented daily:
  - pH
  - turbidity
  - temperatures

  As a part of the Municipal Drinking Water Licence renewal process, the Town of Fort Frances used the last 5 years of collected raw water data to characterize their source water.

- **The owner did not have a harmful algal bloom monitoring plan in place.**

  The DWS owner does not currently have a Harmful Algal Bloom (HAB) monitoring plan in place.

  The ministry has previously issued guidance via a letter asking surface water systems to monitor for algal blooms. Furthermore, renewed Municipal Drinking Water Licence's (MDWL) will include HAB conditions related to monitoring, sampling and reporting. HAB plans must include details relating to: 1.) visual monitoring for HABs at or near the drinking water system intake(s); 2.) details relating to visual monitoring of shoreline for drinking water systems where the proximity of the intake(s) may be of concern; 3.) details relating to reporting and observed or suspected HAB; 4.) a sampling plan, including the identification of sampling location(s) and frequencies and triggers that may increase the sampling frequency, and 5.) up to date records documenting staff training on the HAB monitoring, reporting and sampling procedures.

**Permit To Take Water**

- **The owner was in compliance with all conditions of the PTTW.**

  Permit to Take Water (PTTW) #3528-AE6PEM remains valid until September 27, 2026. The permit allows for the maximum taking of water of 17,000,000 L/day.
  The PTTW also requires the following:
  - Daily, record the date, the volume of water taken on that date and the rate at which it was taken.
  - The Permit Holder shall submit, on or before March 31st in every year, the daily water taking data collected and recorded for the previous year to the ministry's Water Taking Reporting System.
  The requirements noted above were met for the review period. Water taking data is documented, as required, in the facility's excel tracking sheet. A summary of the water taken in 2019 was submitted to the ministry. The maximum volume of raw water taken over a 24 hour period during the review period was 6210 m3/day.

**Capacity Assessment**

- **There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.**

  Conditions 2.1.1 and 2.1.2, Schedule C, Municipal Drinking Water Licence (MDWL) #224-101, requires continuous measurements and recording of the flow rate and daily volume of raw water flowing into the water treatment plant (WTP) and of treated water flowing from the WTP into the distribution system. The Fort Frances WTP is equipped with one raw water flow meter and one treated water flow meter. Data obtained from the flow meters is transferred and recorded into the facility's SCADA monitoring system.
  On March 4, 2020, the drinking water system's uninterrupted power supply (UPS) failed. As a result, flow data was not recorded from 20:12, on March 4, 2020 to 07:50, on March 5, 2020. Despite flow not being recorded during this time, the raw and treated flow meters continued to operate and accurate daily volumes of water into and leaving the plant were documented.

- **The flow measuring devices were calibrated or verified in accordance with the requirements of the MDWL issued under Part V of the SWDA.**

  Records were provided which demonstrated that the raw and treated water flow meters were last calibrated on August 4, 2020 and the backwash flow meter was calibrated on August 5, 2020. The flow meters had been previously calibrated on June 20, 2019.

- **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.**

  Condition 1.1, Schedule C, MDWL #224-101, identifies the rated capacity of the Fort Frances WTP as 17,000 $m^3$/day. This represents the maximum daily volume of treated water that is allowed to be directed to the distribution system, from the WTP.
  During the review period, the highest volume of treated water pumped to the distribution system, in a single day, was 5880 m3. This represents 34.5% of the plants rated capacity.

- **Appropriate records of flows and any capacity exceedances were made in accordance with the Municipal Drinking Water Licence issued under Part V of the SDWA.**

  In addition to continuously monitoring raw and treated water flow, daily, the total volume of water taken over the previous 24 hours is documented, in addition to the peak instantaneous flow.
  There were no water taking exceedances during the review period.

**Treatment Processes**

- **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

  During the inspection, ministry staff toured the water treatment plant and the water tower.

**Treatment Processes**

The following discrepancy was noted in Schedule A of Drinking Water Works Permit (DWWP) #224-201:
• The alum chemical metering pump is described as "having a calibration cylinder controlled automatically on the basis of the raw water flow". A new chemical metering pump has been installed and the new pump does not have a calibration cylinder. The instrument is now calibrated manually by weighing a sample.
During the next Drinking Water Works Permit and Municipal Drinking Water License renewal, the above item is to be updated.

- **The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

  Municipal Water Works Permit (MWWP) # 224-201 allows for the Fort Frances drinking water system to be altered by adding, modifying, replacing or extending a watermain within the distribution system if certain conditions are met. These conditions are outlined in MWWP, Schedule B, section 3.0(3.3) and includes the requirement for all work to be recorded on a "Form 1 - Record of Watermains Authorized as a Future Alteration", prior to the watermain, addition, modification.
  During the inspection review period, three form 1 documents were completed for work in the distribution system. It was confirmed that the Form 1 documents were prepared prior to the work being completed and in accordance with the Drinking Water Works Permit.

- **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.**

  In accordance with O. Reg. 170/03, Schedule 1-2(2), surface water systems must have chemically assisted filtration and disinfection and achieve an overall performance of at least a 2-log (99%) removal/inactivation of Cryptosporidium oocysts, a 3-log (99.9%) removal/inactivation of Giardia cysts, and a 4-log (99.99%) removal/inactivation of viruses, by the time the water is delivered to the first consumer. The Fort Frances WTP achieves the above performance criteria using conventional treatment consisting of coagulation, flocculation, sedimentation filtration, and chlorine disinfection.
  Trends on the SCADA system were reviewed to ensure that minimum chlorine residuals were met continuously. Under worst case conditions (temp 0.5 degrees Celsius, pH 7.5, clear-well level 60% capacity, treated water flow 17000 cubic meters per day), the plant must maintain their chlorine residual above 0.85 mg/L. Records reviewed during the inspection confirmed that the system was providing the required level of treatment throughout the inspection review period. If the treated water chlorine residual dropped below the alarm set point, the high lift pumps will shut down and stop the flow of water to the distribution system.
  Monthly turbidity summaries were reviewed to ensure that the filtered water turbidity was less than or equal to 0.3 NTU in 95% of the measurements taken each month. This was met throughout the inspection review period.

- **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

  Distribution chlorine levels must be maintained at or above 0.05 mg/L at all times. The lowest recorded chlorine level in the distribution system during the inspection review period was 0.18 mg/L, on July 5, 2020, from the water tower.

- **Where an activity has occurred that could introduce contamination, all parts of the drinking water system were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

  Municipal Water Works Permit (MWWP) # 224-201, Schedule B, Condition 2.3 requires all parts of the drinking water system in contact with drinking water which are: added, modified, replaced, extended, or taken out of service for inspection, repair or other activities that lead to contamination, shall be disinfected before being put into service in accordance with the ministry's Watermain Disinfection Procedure.

**Treatment Processes**

Distribution log books and Watermain Shut Down Reports were reviewed and demonstrated disinfection was taking place for work completed in the distribution system.
During the review period, there was no notable work done at the water treatment plant; however, operators are aware of the requirement to disinfect any piece of equipment/part, that is put into the system, that comes into contact with drinking water. Operators were reminded that they should document in the log book whenever they disinfect a piece of equipment.

- **The owner had evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.**

  Chemicals used in the Fort Frances DWS during the inspection review period include:
  - liquid alum for coagulation
  - chlorine gas for disinfection
  - polymer to assist flocculation
  - soda ash for pH adjustment
  - hydrofluosilicic acid for fluoridation
  - calcium hypochlorite for chlorination at the water tower
  - sodium hypochlorite for disinfection in the distribution system

  Supplier statements with ANSI/NSF Standard 60 certification were provided during the inspection for the above noted chemicals. New statements are obtained from the supplier annually.

- **Up-to-date plans for the drinking water system were kept in a place, or made available in such a manner, that they could be readily viewed by all persons responsible for all or part of the operation of the drinking water system in accordance with the DWWP and MDWL issued under Part V of the SDWA.**

  Plant Schematic and blueprints are kept at the water treatment plant. In addition, process flow diagrams for the drinking water system are available in the operations manual. Operators have access to this document electronically.

**Treatment Process Monitoring**

- **Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.**

  The treated water chlorine residual is monitored by a continuous analyzer at the point where treated water enters the distribution system.

- **Operators were aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

- **Continuous monitoring of each filter effluent line was being performed for turbidity.**

  Reg. 170/03, Section 7-3(2)(b) requires the owner of the system to ensure that sampling and testing for turbidity is carried out by continuous monitoring equipment on each filter effluent line.
  All four filters in the WTP are equipped with turbidity analyzers. Continuous turbidity data from each filter is printed daily, reviewed by operators and filed in the WTP office.
  During the review period, on March 4, 2020, at 20:12, due to the failure of the facility's UPS, the facility's main and back-up computer system lost communication with the water plant's controller. As a result of the computer system being down, the continuous SCADA data was not recorded until operators arrived at the plant the following morning, at 07:50. During the time of data loss, the continuous filter effluent turbidity analyzers and alarming system continued to operator. All other systems of the plant were found to be functioning when operators arrived at the water plant the morning of March 5, 2020. The non-compliance with recording filter effluent turbidity every 15

**Treatment Process Monitoring**

minutes will be addressed in a subsequent question.

- **The secondary disinfectant residual was measured as required for the distribution system.**

  O. Reg. 170/03, Section 7-2(3) requires that the owner and operating authority of a large municipal residential system that provides secondary disinfection shall ensure that at least seven (7) distribution samples are taken each week in accordance with subsection (4). For systems which provide chlorination, samples must be tested immediately for free chlorine residual.
  During the review period, a daily distribution chlorine residual was taken from the water tower. The results are documented in the water tower log book.

- **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

  Daily, operators review continuous treated water chlorine residual data, for the previous 24 hours, off the circle chart recorder and filter effluent turbidity from a printout of each filters continuous data, for the previous 24 hour period. In addition, the trending for these parameters are reviewed on the facility's SCADA system, every 24 hours. The operations manual has a standard operating procedure for "Reviewing Continuous Monitoring Turbidity Test Results.

- **Samples for chlorine residual analysis were tested using an acceptable portable device.**

  When continuous monitoring equipment is not being used, chlorine residuals are tested using an electronic hand held portable device.

- **All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.**

  Currently, the alarm set points for chlorine and turbidity are as follows:
  • Final Effluent Low Chlorine Alarm = 1.6 mg/L - If final effluent chlorine levels drop below this set point, an alarm will sound immediately and the high lift pumps will shut down. The system will run off of the water tower.
  • Final Effluent High Chlorine Alarm = 3.2 mg/L - calls out operator on duty.
  • Filter Effluent Turbidity High Alarm = 0.3 NTU - plant alarm sounds, if the filter effluent turbidity continues to exceed the set point for more than 10 min, the filter that is exceeding will shut down and a call out will be made to the on-call operator.
  • Filter Effluent Turbidity High High Alarm = 0.80 NTU - plant immediately alarms, calls out the on-call operator and filter shuts down.
  • Filter Effluent Turbidity Low Alarm = - 0.01 mg/L.

- **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.**

  Final effluent chlorine residuals and filter effluent turbidity from of each filter, are read and recorded in the SCADA system every 60 seconds. Final effluent chlorine residuals are also documented on a chart recorder.
  Daily, the SCADA system prints out a summary of all the filter effluent turbidity data. Based on the data collected, every 15 minutes, the mean, maximum and average values of the previous 15 minutes of data are recorded.
  During the inspection, it was confirmed that the minimum testing and recording frequency was met for the inspection review period, except from 20:12, on March 4, 2020 to 07:50, on March 5, 2020. During this time, data was lost due to a failure of the facility's UPS. Upon further evaluation, it was discovered both the main and back up computer failed because they were on the same power circuit. Once aware of the issue, operators immediately hooked up to an external power source and regained operation of their computer system and ability to continuously record data.

**Treatment Process Monitoring**

Treated water chlorine residual data was also unavailable on the SCADA system for this time period, but the data was available on the chart record.

- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

  O. Reg. 170/03, section 6-5(1)8, requires that the continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions.
  The Rosemont Chlorine Residual Analyzer is used to continuously monitor the treated water chlorine residual. The instruction manual for this instrument does not state how frequently the instrument is to be calibrated; therefore, O. Reg. 170/03, Schedule 6, section 6-5(1)10 applies. This section requires that the instrument be checked and calibrated as frequently as necessary to ensure that the margin of error for free chlorine residual test results are within 0.05 mg/L, if the concentrations usually measured by the equipment are less than or equal to 1.0 mg/L, and proportionally higher if the concentrations usually measured are greater than 1.0 mg/L.
  Documentation shows that the treated water chlorine analyzer was last calibrated by an outside party on August 4, 2020 and had been previously calibrated on August 20, 2019. In addition, manual chlorine residuals are taken daily and compared to the on-line analyzer. If the analyzer starts to drift, an in- house calibration is completed.
  Rosemount Clarity II Turbidity Analyzers are used to continuously monitor the filter effluent turbidity on each filter. The instruction manual, for these instruments requires that they be calibrated annually. Documentation shows that the filter 1, 3 and 4 turbidity analyzers were calibrated on Aug. 4 and 5, 2020 and had been previously calibrated on August 20, 2019 (filter #2 was not calibrated because it is currently off-line and there are no plans to bring it back on-line at this time). In addition, in-house calibrations of the # 1, 3 and 4 filter effluent turbidity analyzers are completed.

**Process Wastewater**

- **The process wastewater and residual solids/sludges were treated, handled and disposed of in accordance with the design requirements approved under the Drinking Water Works Permit and the Municipal Drinking Water Licence.**

  The facility's MDWL/DWWP does not require process wastewater solids/sludges to be treated, handled or disposed of in a certain manner.
  Backwash water from the filters is directed to the municipal sanitary sewage system. Once annually, the plant will be drained and the clarifiers cleaned. Sludge removed from the clarifiers is discharged to the sanitary sewage system as well.
  A written protocol has been developed by the Town for discharging sludge from the drinking water system to the sewage system, to ensure that the wastewater treatment process does not become disrupted/overwhelmed.

- **The process wastewater discharge monitoring program and discharge quality complied with requirements established in the Municipal Drinking Water Licence Issued under Part V of the SDWA.**

  Suspended solids are required to be monitored quarterly at the point of discharge to the Rainy River. Records indicate that manual composite samples were collected quarterly during the inspection review period and were tested for suspended solids. Suspended solids concentration limits are not prescribed by the MDWL.

**Distribution System**

- **The owner had up-to-date documents describing the distribution components as required.**

  The distribution map shows the distribution components were last updated on January 18, 2021.

- **There is a backflow prevention program, policy and/or bylaw in place.**

  The Town of Fort Frances has adopted Water System Management By-law 16/06 which includes provisions for cross connection control. The Town's backflow prevention program aims at installing backflow prevention devices

**Distribution System**

at all locations that are deemed to be high risk areas (i.e. mill, car wash, laundromats) and all new businesses are required to have a device installed. Backflow prevention devices are also being installed at locations where water meters are required to be replaced.

- **The owner had a program or maintained a schedule for routine cleanout, inspection and maintenance of reservoirs and elevated storage tanks within the distribution system.**

  The clearwell at the WTP is drained and cleaned out annually. The water tower is on a 5 year inspection rotation with the last inspection occurring in 2015. Due to limitations as a result of the pandemic, the 5 year assessment did take place in 2020.

- **The owner had implemented a program for the flushing of watermains as per industry standards.**

  The Town of Fort Frances flushes 20% of their distribution system annually, on a rotational basis, ensuring that the entire distribution system is flushed over a five year period.

- **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**

  Disinfectant residuals are taken daily at the water tower. Microbiological samples are taken at various locations throughout the town, providing a good representation of disinfectant residuals throughout the distribution system.

- **A program was in place for inspecting and exercising valves.**

  There are approximately 640 valves in the distribution system. Annually, operators exercise 20% of the valves. In addition, the town strives to replace 20 valves annually.

- **There was a program in place for inspecting and operating hydrants.**

  The Town of Fort Frances aims to flush 20% of their hydrants and visually inspect every hydrant annually.

- **There was a by-law or policy in place limiting access to hydrants.**

  By-law no. 16/06 includes provisions restricting the use of fire hydrants for emergency operations and training for the fire department.

- **The owner was able to maintain proper pressures in the distribution system and pressure was monitored to alert the operator of conditions which may lead to loss of pressure below the value under which the system is designed to operate.**

  Water pressure is monitored leaving the plant. There were no water pressure issues in the distribution system during the review period.

- **The donor had provided an Annual Report to the receiver stand alone distribution system(s) connected to this system.**

  The Town of Fort Frances provide copies of the Annual Report to Couchiching FN, Lakeview Trailer Park, Walleye Trailer Park, and an apartment complex located in Alberton Township.

**Operations Manuals**

- **Operators and maintenance personnel had ready access to operations and maintenance manuals.**

- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and**

**Operations Manuals**

**Municipal Drinking Water Licence issued under Part V of the SDWA.**

**Logbooks**

- **Logbooks were properly maintained and contained the required information.**

- **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

  Log book entries indicate that all manual operational testing was completed by certified operators.

- **For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.**

- **The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.**

- **Logs or other record keeping mechanisms were available for at least five (5) years.**

**Contingency/Emergency Planning**

- **Spill containment was provided for process chemicals and/or standby power generator fuel.**

- **Clean-up equipment and materials were in place for the clean up of spills.**

- **Standby power generators were tested under normal load conditions.**

  The facility's generator is tested monthly, for 1 hour.

**Security**

- **All storage facilities were completely covered and secure.**

  Water storage is provided by the clearwell at the WTP and by a water tower in the distribution system. All facilities are locked at all times when personnel are absent. The water tower is fenced and equipped with a locked gate. 'No Trespassing' signs have been posted at both locations.

- **Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.**

  The clearwell is vented to the inside of the WTP via three inverted, J-shaped pipes that extend from the clearwell through the main floor of the plant. Vents to the water tower are equipped with screens.

- **The owner had provided security measures to protect components of the drinking water system.**

  Security measures provided at the WTP include:
  - "No Trespassing" signs;
  - alarm system; and
  - locked doors when employees are not present.

  Security measures provided at the water tower include:
  - "No Trespassing" signs; and

**Security**

- a fence around the water tower that is gated and locked

There are a limited number of keys available for the WTP and the water tower.

**Consumer Relations**

- **The owner and/or operating authority undertook efforts to promote water conservation and reduce water losses in their system.**

  During the summer months there is a water conservation program in place for watering lawns.

**Certification and Training**

- **The overall responsible operator had been designated for each subsystem.**

  The Fort Frances WTP is a Class 3 subsystem and the distribution system is a Class 2 subsystem.
  Two operators operated as the ORO for both the WTP and distribution system during the inspection review period. Both ORO's hold valid water treatment subsystem and distribution system certificates. The ORO for the WTP and distribution system is listed in each logbook daily.

- **Operators-in-charge had been designated for all subsystems which comprised the drinking water system.**

  Only operators with the appropriate level of certification were designated as the OIC for the review period. The OIC's for both the WTP and distribution system are listed in the WTP and distribution logbook daily.

- **All operators possessed the required certification.**

  Only certified operators work at this facility. Appropriately certified operators were designated in the roles of OIC and ORO.

- **Only certified operators made adjustments to the treatment equipment.**

**Water Quality Monitoring**

- **All microbiological water quality monitoring requirements for raw water samples were being met.**

  O. Reg. 170/03, Schedule 10, Section 10-4, requires that at least one raw water sample be taken every week and tested for total coliform bacteria and E. coli. This requirement was met throughout the inspection review period.

- **All microbiological water quality monitoring requirements for distribution samples were being met.**

  Reg. 170/03, Schedule 10, section 10-2 requires owners and operating authorities of DWS's that serve 100,000 people or fewer to ensure that at least eight distribution samples plus one additional distribution sample for every 1,000 people served by the system are taken each month.
  At least one of the samples must be taken each week. The samples must be tested for E. coli and total coliform bacteria with at least 25% of the required samples to be tested for general bacteria measured using heterotrophic plate counts (HPC).
  The Fort Frances DWS serves a population of approximately 8,000 people; therefore, at least 16 distribution samples must be taken every month. This requirement was met throughout the inspection review period.

- **All microbiological water quality monitoring requirements for treated samples were being met.**

  Section 10-3, O. Reg. 170/03, requires drinking water system owners to ensure that at least one treated water sample is taken every week (from the point of entry to the distribution system) and is tested for total coliform bacteria, E. coli, and HPC bacteria. Samples must be taken at least 5 days and not more than 10 days from when the previous weekly treated water sample was taken.

**Water Quality Monitoring**

This requirement was met throughout the inspection review period except for on July 6, 2020. On this date, the Chain of Custody demonstrated operators requested that the treated sample be analyzed for HPC bacteria; however, due to lab error, this parameter was not analyzed, on this date. This issue was outside the control of the operator and is not considered an item of non-compliance.

- **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Treated water samples must be taken at least once every 12 months (+/- 30 days from the anniversary of the previous sampling date) and tested for the inorganic parameters listed in O. Reg. 170/03, Schedule 23. These parameters were last sampled for on March 18, 2020, and had been previously sampled on March 12, 2019.

- **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Treated water samples must be taken at least once every 12 months, +/- 30 days from the anniversary of the previous sampling date and tested for organic parameters listed in O. Reg. 170/03, Schedule 24. These parameters were last sampled for on March 18, 2020, and had been previously sampled on March 12, 2019.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

  In accordance with section 13-6.1, Schedule 13, O. Reg. 170/03, a sample from the distribution system or plumbing is required to be taken and tested for Haloacetic acid (i.e. HAAs) once in each calendar quarter, from a location that is likely to have an elevated potential for the formation of HAA's. During the inspection review period, HAA samples were collected from the water tower in each calendar quarter. The running annual average (RAA) at the time of the inspection was 70.3 ug/L, the maximum acceptable concentration is 80 ug/L.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

  In accordance with section 13-6, Schedule 13, O. Reg. 170/03, a sample from the distribution system or plumbing is required to be taken and tested for Trihalomethanes (i.e. HAAs) once in each calendar quarter, from a location that is likely to have an elevated potential for the formation of THM's.
  During the inspection review period, THM samples were collected from the water tower, in each calendar quarter. The running annual average THM concentration at the time of the inspection was 92 ug/L, the maximum acceptable concentration is 100 ug/L.

- **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

  Treated water samples must be taken every three months for analysis of nitrate and nitrite, in accordance with O. Reg. 170/03, Schedule 13, section 13-7.
  During the inspection review period, samples were collected in each calendar quarter. All nitrate and nitrite samples were collected from the WTP at the point of entry to the distribution system. All samples met the requirements listed above.

- **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Sodium samples must be collected from the WTP at the point of entry to the distribution system at least once every 60 months to meet the requirements of O. Reg. 170/03, Schedule 13, section 13-8. A sodium sample was last collected from the Fort Frances WTP on March 18, 2020 and the result was 18.2 mg/L. It had been previously sampled on March 9, 2015.

- **The required daily samples were being taken at the end of the fluoridation process.**

**Water Quality Monitoring**

Schedule 7, section 7-4 of O. Reg. 170/03 requires that if a drinking water system provides fluoridation, the owner of the system and the operating authority for the system shall ensure that a water sample is taken at the end of the fluoridation process at least once every day and is tested for fluoride. Fluoride residuals were being recorded daily by operators. Fluoride is monitored by a continuous analyzer at the same location as the treated water chlorine analyzer, after treatment, prior to water leaving the plant.
During the review period, the highest fluoride residual observed from the daily recording of fluoride residual was 0.79 mg/L. The limit for fluoride is 1.5 mg/L.

- **The owner ensured that water samples were taken at the prescribed location.**

- **All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met.**

  Suspended solids are required to be monitored quarterly at the point of discharge to the Rainy River. Records indicate that manual composite samples were collected quarterly during the inspection review period and were tested for suspended solids.

- **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

  O. Reg. 170/03, Schedule 15.1 outlines the drinking water system's lead sampling requirements. After completing two consecutive rounds of reduced lead sampling in 2019, the Town of Fort Frances qualified for the exemption from having to take lead samples from plumbing. This means that the Town of Fort Frances is required to test for pH and alkalinity in each of the sampling periods, from 4 distribution locations. In every third year, a lead sample must also be taken in conjunction with the pH and alkalinity tests from 4 distribution locations.
  In 2020, the Town of Fort Frances obtained pandemic relief from lead sampling. The relief allowed for lead sampling to not take place during the December 15, 2019 to April 15, 2020 sampling period and only required that lead sampling take place at 4 non-residential and 4 distribution locations during the June 15, 2020 to October 15, 2020 sampling period. All lead sampling requirements were met during the review period; however, sampling relief provided by the regulation did not require lead sampling to take during the 2020 sampling period, it only required pH and alkalinity to be taken from 4 distribution locations.

- **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

- **The owner indicated that the required records are kept and will be kept for the required time period.**

**Water Quality Assessment**

- **Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

  During the review period there were a number of samples taken from the distribution system that showed the presence of total coliforms. The adverse samples were taken on the following dates:
  - June 17, 2020
  - August 12, 2020
  - August 16, 2020 (resample due to August 12, 2020 sample)
  - December 9, 2020

**Reporting & Corrective Actions**

- **Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

**Reporting & Corrective Actions**

- **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

  During the review period, an AWQI was received on September 12, 2020, for the presence of total coliforms. On this date, the 2A form did not indicate when the verbal notifications to the ministry's Spills Action Centre or the local medical officer of health were made; however, the ministry's database captured that a verbal notification was made to the ministry at 15:49, on September 12, 2020 and the municipality provided a record demonstrating the local health unit was contacted at 15:51.

- **All required written notices of adverse water quality incidents were not provided as per O. Reg. 170/03 16-7.**

  O. Reg. 170/03, Schedule 16, section 16-7 requires that 24 hours after providing an immediate verbal notification of an adverse drinking water test result, a written notification of the adverse must be sent to the ministry's Spills Action Centre and the medical officer of health. On September 12, 2020, a verbal notification was made to the Ministry's Spills Action Centre at 15:49, for an adverse test result showing the presence of total coliforms. The written notification for this adverse was not sent out until September 14, 2020, greater than 24 hours after the verbal notifications were made. In addition, the form was completed incorrectly. The form is supposed to capture the date and time the municipality makes a verbal notification to the ministry's Spills Action Centre and medical officer health and specifically who received the verbal notification. During this event, the form captured the date and time the lab made these notifications, not when the municipality made these notifications.

- **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O. Reg. 170/03 16-9.**

- **All reporting requirements for lead sampling were not complied with as per schedule 15.1-9 of O. Reg. 170/03.**

  O. Reg. 170/03, Schedule 15.1, section 15.1-9(1) requires that within 7 days of receiving lead plumbing sample results, a report containing the following, shall be give to the owner:
  - a copy of the report
  - a statement whether the report indicates a result that exceeds any Schedule 2 standard
  - a telephone number of a person who is available to answer questions about the report.

  During the review period, lead samples were taken from 4 businesses in the fall of 2020. A copy of the lead sample results were not provided to the businesses within 7 days of receiving the lead sample results. None of the samples resulted in a lead exceedance.

- **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

- **The Annual Report did not contain the required information and/or was not prepared by February 28th of the following year.**

  O. Reg. 170/03, section 11(6)(b) and (d) detail that the Annual Report is to include a summary of any reportable events made to the ministry (i.e. adverse test results or observation of improper disinfection), as required by the regulation and describe any corrective actions taken under Schedule 17.
  Although the Annual Report included the number of microbiological distribution samples taken, it failed to capture that a February 25, 2019, distribution sample resulted in an adverse (presence of total coliforms) that was reported to the Spills Action Centre and corrective action was taken to address this issue.

- **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

  The 2019 Summary Report contained the required information and was submitted to council on March 10, 2020.

**Reporting & Corrective Actions**

- **All changes to the system registration information were provided within ten (10) days of the change.**

## NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

**This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.**

1. **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.**

   Final effluent chlorine residuals and filter effluent turbidity from of each filter, are read and recorded in the SCADA system every 60 seconds. Final effluent chlorine residuals are also documented on a chart recorder.
   Daily, the SCADA system prints out a summary of all the filter effluent turbidity data. Based on the data collected, every 15 minutes, the mean, maximum and average values of the previous 15 minutes of data are recorded.
   During the inspection, it was confirmed that the minimum testing and recording frequency was met for the inspection review period, except from 20:12, on March 4, 2020 to 07:50, on March 5, 2020. During this time, data was lost due to a failure of the facility's UPS. Upon further evaluation, it was discovered both the main and back up computer failed because they were on the same power circuit. Once aware of the issue, operators immediately hooked up to an external power source and regained operation of their computer system and ability to continuously record data. Treated water chlorine residual data was also unavailable on the SCADA system for this time period, but the data was available on the chart record.

   **Action(s) Required:**

   Since the UPS failure, an electrician has installed 2 new UPS units for the main and backup computer and put the plant's controllers on separate power circuits, so that if one system fails, the other should continue to operate.
   No further action is required at this time, to address this issue.

2. **All required written notices of adverse water quality incidents were not provided as per O. Reg. 170/03 16-7.**

   O. Reg. 170/03, Schedule 16, section 16-7 requires that 24 hours after providing an immediate verbal notification of an adverse drinking water test result, a written notification of the adverse must be sent to the Ministry's Spills Action Centre and the medical officer of health. On September 12, 2020, a verbal notification was made to the Ministry's Spills Action Centre at 14:46 and a public health inspector at 15: 39, for an adverse test result showing the presence of total coliforms. The written notification for this adverse was not sent out until September 14, 2020, greater than 24 hours after the verbal notifications were made.

   **Action(s) Required:**

   Since this incident, the local water inspector has communicated with operators the need to provide a written notification of a reportable event within 24 hours of making the verbal notification. A subsequent reportable incident demonstrated that the written notification was submitted within the required timeframe.
   The Town of Fort Frances shall ensure that all future written notifications of reportable events as detailed under Schedule 16 of O. Reg. 170/03 are submitted within 24 hours of making the verbal notification.

3. **All reporting requirements for lead sampling were not complied with as per schedule 15.1-9 of O. Reg. 170/03.**

   O. Reg. 170/03, Schedule 15.1, section 15.1-9(1) requires that within 7 days of receiving lead plumbing sample results, a report containing the following, shall be give to the owner:
   - a copy of the report
   - a statement whether the report indicates a result that exceeds any Schedule 2 standard
   - a telephone number of a person who is available to answer questions about the report.

   During the review period, lead samples were taken from 4 businesses in the fall of 2020. A copy of the lead sample results were not provided to the businesses within 7 days of receiving the lead sample results. None of the samples resulted in a lead exceedance.

**Action(s) Required:**

On February 11, 2021, the lead sample results were hand delivered to the 4 businesses whose water was sampled for lead in the fall of 2020. Delivery of the sample results has resolved this item of non-compliance. No further action is required at this time.

**4. The Annual Report did not contain the required information and/or was not prepared by February 28th of the following year.**

O. Reg. 170/03, section 11(6)(b) and (d) detail that the Annual Report is to include a summary of any reportable events made to the ministry (i.e. adverse test results or observation of improper disinfection), as required by the regulation and describe any corrective actions taken under Schedule 17.
Although the Annual Report included the number of microbiological distribution samples taken, it failed to capture that a February 25, 2019, distribution sample resulted in an adverse (presence of total coliforms) that was reported to the Spills Action Centre and corrective action was taken to address this issue.

**Action(s) Required:**

By March 26, 2021, the 2019 Annual Report is to be updated to include the February 25, 2019 adverse sample and summarize of corrective actions taken to address the adverse.
By the same date, a copy of the updated 2019 Annual Report is to be submitted to the undersigned officer.

## SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

**This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.**

**1. The owner did not have a harmful algal bloom monitoring plan in place.**

The DWS owner does not currently have a Harmful Algal Bloom (HAB) monitoring plan in place.

The ministry has previously issued guidance via a letter asking surface water systems to monitor for algal blooms. Furthermore, renewed Municipal Drinking Water Licence's (MDWL) will include HAB conditions related to monitoring, sampling and reporting. HAB plans must include details relating to: 1.) visual monitoring for HABs at or near the drinking water system intake(s); 2.) details relating to visual monitoring of shoreline for drinking water systems where the proximity of the intake(s) may be of concern; 3.) details relating to reporting and observed or suspected HAB; 4.) a sampling plan, including the identification of sampling location(s) and frequencies and triggers that may increase the sampling frequency, and 5.) up to date records documenting staff training on the HAB monitoring, reporting and sampling procedures.

**Recommendation:**

In preparation for the new condition to be added to the facility's licence, it is recommended that the facility develop a Harmful Algal Bloom Monitoring Plan. The plan may include, but not be limited to the following:

• Directly observing source water approaching and standing at system intake(s);

• Diligently collecting raw and treated water samples for total microcystin testing at a licensed laboratory;

• Notifying the Ministry, the local Medical Officer of Health (and the local Conservation Authority, if applicable) when a bloom has been observed in order that actions can be taken to protect the public.

## SIGNATURES

| | |
|---|---|
| Inspected By: | Signature: (Provincial Officer) |
| Carolyn Lacroix | C Lacroix |
| Reviewed & Approved By: | Signature: (Supervisor) |
| Paula Spencer | Paula Spencer |

Review & Approval Date: February 24, 2021

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

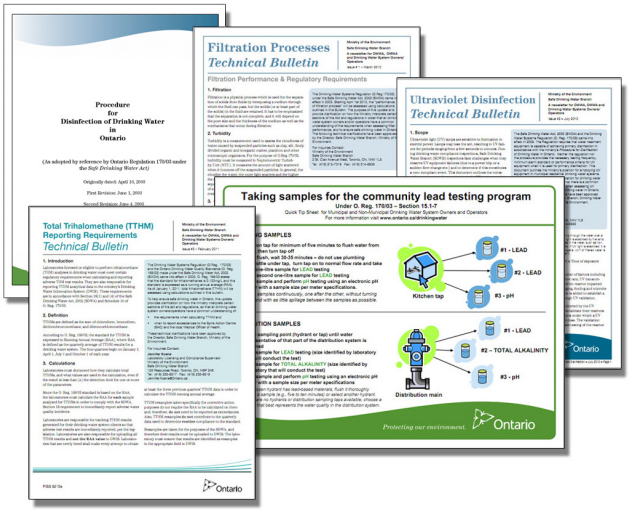
## Key Reference Materials

# Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or **picemail.moe@ontario.ca**.

For more information on Ontario's drinking water visit **www.ontario.ca/drinkingwater** and email **drinking.water@ontario.ca** to subscribe to drinking water news.




| PUBLICATION TITLE | PUBLICATION NUMBER |
|---|---|
| Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils | 7889e01 |
| FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form | 7419e, 5387e, 4444e |
| Procedure for Disinfection of Drinking Water in Ontario | 4448e01 |
| Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids | 7152e |
| Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011) | 8215e |
| Filtration Processes Technical Bulletin | 7467 |
| Ultraviolet Disinfection Technical Bulletin | 7685 |
| Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications | 7014e01 |
| Certification Guide for Operators and Water Quality Analysts | |
| Guide to Drinking Water Operator Training Requirements | 9802e |
| Taking Samples for the Community Lead Testing Program | 6560e01 |
| Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption | 7423e |
| Guide: Requesting Regulatory Relief from Lead Sampling Requirements | 6610 |
| Drinking Water System Contact List | 7128e |
| Technical Support Document for Ontario Drinking Water Quality Standards | 4449e01 |



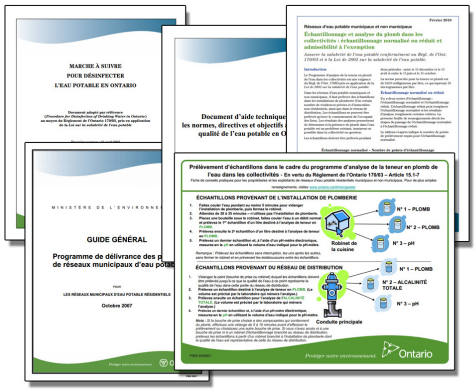
PIBS 8990b01

Ontario

# Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment.

Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le Centre d'information au public au 1 800 565-4923 ou au 416 325-4000, ou encore à **picemail.moe@ontario.ca** si vous avez des questions ou besoin d'aide.




Pour plus de renseignements sur l'eau potable en Ontario, consultez le site **www.ontario.ca/eaupotable** ou envoyez un courriel à **drinking.water@ontario.ca** pour suivre l'information sur l'eau potable.

| TITRE DE LA PUBLICATION | NUMÉRO DE PUBLICATION |
|---|---|
| Prendre soin de votre eau potable – Un guide destiné aux membres des conseils municipaux | 7889f01 |
| Renseignements sur le profil du réseau d'eau potable, Avis de demande de services de laboratoire, Formulaire de communication de résultats d'analyse insatisfaisants et du règlement des problèmes | 7419f, 5387f, 4444f |
| Marche à suivre pour désinfecter l'eau potable en Ontario | 4448f01 |
| Strategies for Minimizing the Disinfection Products Thrihalomethanes and Haloacetic Acids (en anglais seulement) | 7152e |
| Total Trihalomethane (TTHM) Reporting Requirements: Technical Bulletin (février 2011) (en anglais seulement) | 8215e |
| Filtration Processes Technical Bulletin (en anglais seulement) | 7467 |
| Ultraviolet Disinfection Technical Bulletin (en anglais seulement) | 7685 |
| Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable, de modification du permis de réseau municipal d'eau potable, de renouvellement du permis de réseau municipal d'eau potable et de permis pour un nouveau réseau | 7014f01 |
| Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable | |
| Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable | 9802f |
| Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités | 6560f01 |
| Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption | 7423f |
| Guide: Requesting Regulatory Relief from Lead Sampling Requirements (en anglais seulement) | 6610 |
| Liste des personnes-ressources du réseau d'eau potable | 7128f |
| Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario | 4449f01 |

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PIBS 8990b01

Ontario

## Inspection Summary Rating Record

**Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2020-2021)**

| | |
|---|---|
| **DWS Name:** | FORT FRANCES DRINKING WATER SYSTEM |
| **DWS Number:** | 220000978 |
| **DWS Owner:** | Fort Frances, The Corporation Of The Town Of |
| **Municipal Location:** | Fort Frances |
| **Regulation:** | O.REG 170/03 |
| **Category:** | Large Municipal Residential System |
| **Type Of Inspection:** | Detailed |
| **Inspection Date:** | January 8, 2021 |
| **Ministry Office:** | Kenora Area Office |

**Maximum Question Rating:** 662

| Inspection Module | Non-Compliance Rating |
|---|---|
| Permit To Take Water | 0 / 12 |
| Capacity Assessment | 0 / 42 |
| Treatment Processes | 0 / 93 |
| Process Wastewater | 0 / 20 |
| Distribution System | 0 / 8 |
| Operations Manuals | 0 / 42 |
| Logbooks | 0 / 30 |
| Certification and Training | 0 / 42 |
| Water Quality Monitoring | 0 / 136 |
| Reporting & Corrective Actions | 18 / 96 |
| Treatment Process Monitoring | 21 / 141 |
| **TOTAL** | **39 / 662** |

| | |
|---|---|
| **Inspection Risk Rating** | **5.89%** |

| | |
|---|---|
| **FINAL INSPECTION RATING:** | **94.11%** |

**Inspection Rating Record Generated On 23-FEB-21 (Inspection ID: 1-O99X1).**

**Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2020-2021)**

| | |
|---|---|
| **DWS Name:** | FORT FRANCES DRINKING WATER SYSTEM |
| **DWS Number:** | 220000978 |
| **DWS Owner:** | Fort Frances, The Corporation Of The Town Of |
| **Municipal Location:** | Fort Frances |
| **Regulation:** | O.REG 170/03 |
| **Category:** | Large Municipal Residential System |
| **Type Of Inspection:** | Detailed |
| **Inspection Date:** | January 8, 2021 |
| **Ministry Office:** | Kenora Area Office |

| Non-compliant Question(s) | Question Rating |
|---|---|
| **Reporting & Corrective Actions** | |
| Was an Annual Report containing the required information prepared by February 28 of the following year? | 4 |
| Were all required written notices of adverse water quality incidents provided as per O. Reg. 170/03 16-7? | 6 |
| Were all reporting requirements for lead sampling complied with as per schedule 15.1-9 of O. Reg. 170/03? | 8 |
| **Treatment Process Monitoring** | |
| Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format? | 21 |
| **TOTAL QUESTION RATING** | 39 |

**Maximum Question Rating:** 662

| | |
|---|---|
| **Inspection Risk Rating** | **5.89%** |

| | |
|---|---|
| **FINAL INSPECTION RATING:** | **94.11%** |

**Inspection Rating Record Generated On 23-FEB-21 (Inspection ID: 1-O99X1).**

# APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years to account for legislative and societal changes that affect acceptable risk levels. As a result of the most recent review, the methodology has been modified to present an improved metric for the evaluation of the risk/safety of MRDWS operations.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that



PIBS 6797e

ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry have assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. It shows areas where a system's operation can improve. To that end, the ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

## Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

**RISK = LIKELIHOOD × CONSEQUENCE**
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

**TABLE 1:**

| Likelihood of Consequence Occurring | Likelihood Value |
|---|---|
| 0% - 0.99% (Possible but Highly Unlikely) | L = 0 |
| 1 – 10% (Unlikely) | L = 1 |
| 11 – 49% (Possible) | L = 2 |
| 50 – 89% (Likely) | L = 3 |
| 90 – 100% (Almost Certain) | L = 4 |

**TABLE 2:**

| Consequence | Consequence Value |
|---|---|
| Medium Administrative Consequence | C = 1 |
| Major Administrative Consequence | C = 2 |
| Minor Environmental Consequence | C = 3 |
| Minor Health Consequence | C = 4 |
| Medium Environmental Consequence | C = 5 |
| Major Environmental Consequence | C = 6 |
| Medium Health Consequence | C = 7 |
| Major Health Consequence | C = 8 |

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

**Table 3** presents a sample question showing the risk rating determination process.

**TABLE 3:**

**Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?**

| **Risk = Likelihood × Consequence** | | | | | | | |
|---|---|---|---|---|---|---|---|
| C=1 | C=2 | C=3 | C=4 | C=5 | C=6 | C=7 | C=8 |
| **Medium** Administrative Consequence | **Major** Administrative Consequence | **Minor** Environmental Consequence | **Minor** Health Consequence | **Medium** Environmental Consequence | **Major** Environmental Consequence | **Medium** Health Consequence | **Major** Health Consequence |
| L=4 (Almost Certain) | L=1 (Unlikely | L=2 (Possible) | L=3 (Likely) | L=3 (Likely) | L=1 (Unlikely | L=3 (Likely) | L=2 (Possible) |
| **R=4** | **R=2** | **R=6** | **R=12** | **R=15** | **R=6** | **R=21** | **R=16** |

## Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as “yes”, “no” or “not applicable” into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone), type of inspection (i.e., focused, detailed), and source type (i.e., groundwater, surface water).

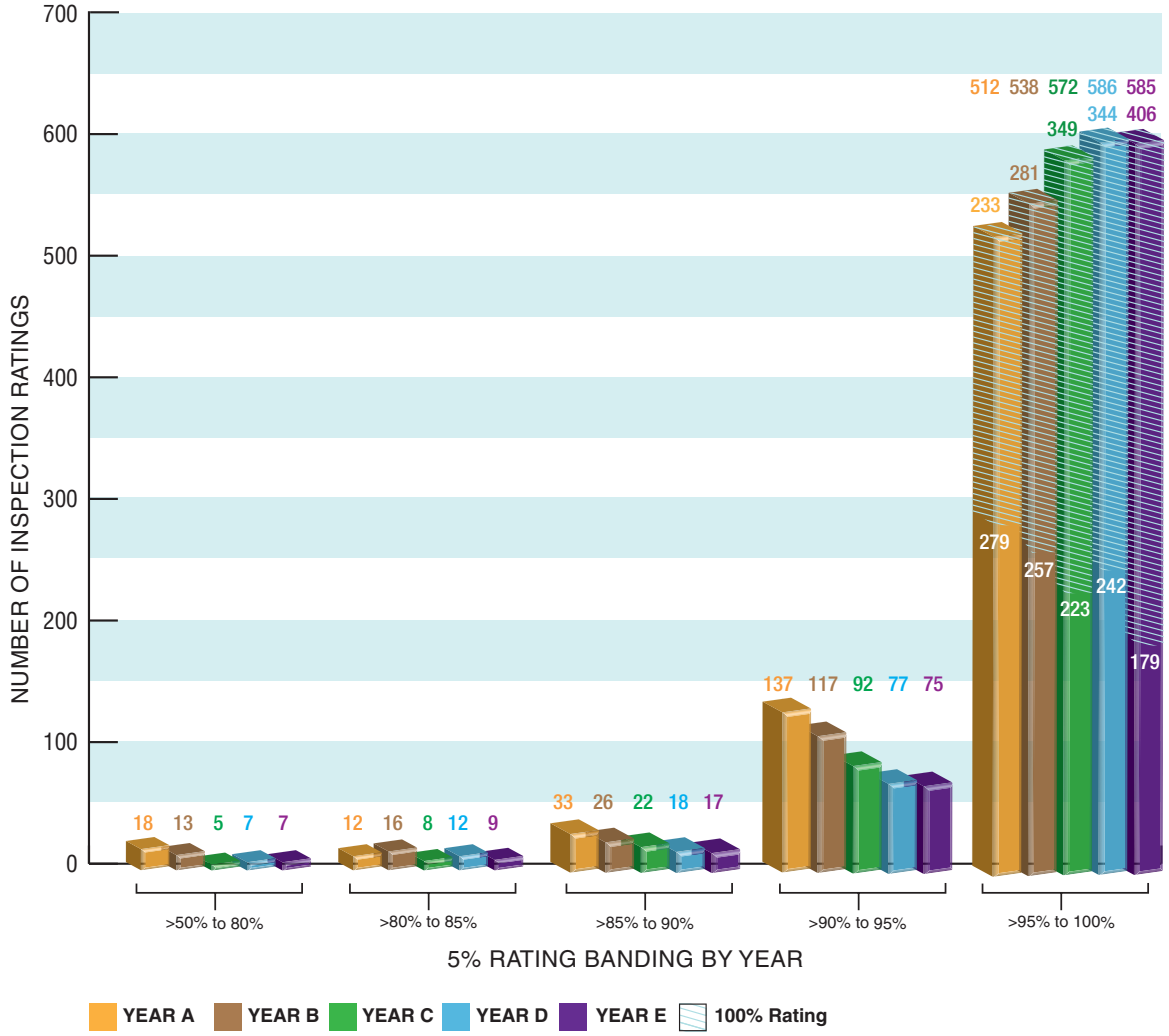
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

## Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

**Figure 1** presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

**Figure 1: Year Over Year Distribution of MRDWS Ratings**




## Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks
9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

For further information, please visit **www.ontario.ca/drinkingwater**

FORTFRANCES
BOUNDLESS

**To:** Craig Miller, QMS Representative

**From:** Cody Vangel, QMS Internal Auditor

**CC:** Greg Wiedenhoeft, ORO; Travis Rob, QMS Representative Alternate

**Date:** July 29, 2021

**Re:** 2021 QMS Operational Plan Internal Audit Results

---

Dear Craig Miller,

Please accept the submission of the Internal Audit Report conducted on the QMS Operational Plan for the Town of Fort Frances Operations and Facilities Division. The internal audit was completed between June 29, 2021 and July 29, 2021. This is well within the timelines initially set out in the audit schedule.

The attached report details the results of the document review as well as the staff interviews. I have also attached a copy of the Internal Audit Checklists completed during the document review phase of the audit. I would like to thank yourself and all affected staff for their cooperation during this study of the Operational Plan. If you have any questions regarding the content of the attached documents, please do not hesitate to contact myself.

Sincerely,

Cody Vangel
QMS Internal Auditor
Ph: 274-5323 ext. 1216
cvangel@fortfrances.ca

| | |
|---|---|
| FORTFRANCES BOUNDLESS | Fort Frances Drinking Water System<br><br>Internal Audit Report |

**Element Audited**: QMS Operational Management System, June 18, 2021 Revision 14

**Date:** July 29, 2021

**Auditor:** Cody Vangel

## Scope

This Internal Audit covers 21 elements of the DWQMS, the Town of Fort Frances water Treatment Plant and Water Distribution System. The Internal Audit was completed between June 29, 2021 – July 29, 2021 as per the Internal Audit Schedule. The desktop review was from June 30 to July 9, 2021. Interviews took place for the QMS Team Staff July 15-21, 2021. Final Audit Report deadline was scheduled with Craig Miller to be completed July 29, 2021.

## Document Review

The QMS Operational Plan, June 18, 2021 Revision 14 was reviewed prior to the personnel interviews. The findings of the documents reviewed, and personal interviews are as outlined below:

## Findings

| | |
|---|---|
| DWQMS Reference:<br>Results:<br>Details:<br><br><br>Results:<br>Details: | 1. Quality Management System<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard.<br><br>**Opportunity for Improvement**<br>Have the applicable element title/heading match that in the table of contents |
| DWQMS Reference:<br>Results:<br><br>Details: | 2. Quality Management System Policy<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard. |
| DWQMS Reference:<br>Results: | 3. Commitment and Endorsement<br>**Conforms** |

| | |
|---|---|
| Details:<br><br>Results:<br>Details: | The information provided in the Operational Plan meets the requirements of the standard.<br><br>**Opportunity for improvement**<br>The Town is undergoing a search to fill the CAO role. Upon selection of the new CAO, this endorsement should be updated with signature of the new CAO. |
| DWQMS Reference:<br>Results:<br>Details:<br><br>Results:<br>Details: | 4. Quality Management System Representative<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard<br><br>**Opportunity for Improvement**<br>Have the applicable element title/heading match that in the table of contents |
| DWQMS Reference:<br>Results:<br>Details:<br><br>Results:<br>Details: | 5. Document and Records Control<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard<br><br>**Opportunity for Improvement**<br>A grammatical correction that may be considered for item 5.2.(c)(3) is that the parentheses should be altered to read as follows:<br><br>A standard footer shall identify all QMS internal documents. This footer contains the following wording “Town of Fort Frances QMS Operational Plan”, and the last revision date. |
| DWQMS Reference:<br>Results:<br>Details:<br><br>Results:<br>Details: | 6. Drinking Water System<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard<br><br>**Opportunity for Improvement**<br>• Revise the introduction paragraph to include Friesen 5 at 121 Oakwood Road.<br>• Revise 121 Oakwood Drive to 121 Oakwood Road. |

| | |
|---|---|
| | • Item 6.4 refers to a risk assessment under Element 8, this should read Element 7.<br>• Regarding item 6.5, address will change to 901 Agamiing Drive come January 1, 2022.<br>• A legend detailing water supply lines and hydrants may be beneficial on the maps in Appendix "I".<br>• In item 6.6, Colonization Road West is changing to Sunset Drive January 1, 20<br>• Describe fuel source for standby generator. (diesel, gasoline, propane, natural gas?) |
| DWQMS Reference:<br>Results:<br>Details: | 7. Risk Assessment<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 8. Risk Assessment Outcomes<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br><br>Results:<br>Details:<br><br><br>Results:<br>Details: | 9. Organizational Structure, Roles, Responsibilities and Authorities.<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard<br><br>**Opportunity for Improvement**<br>• OFEC appointment is under By-law 53/16, instead of 21/94<br>• Emergency plan is located under "N" drive, not the "G" drive ("G" does not exist). The current plan under the "N" drive is outdated and needs to be updated. This is referenced in Secretary/Receptionist section.<br>• The Operations and Maintenance manual in the WTP Control Room should be updated to indicate the new ORO. Existing manual shows the interim ORO from early 2021. |
| DWQMS Reference:<br>Results: | 10. Competencies<br>**Conforms** |

| | |
|---|---|
| Details: | The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details:<br><br><br>Results:<br>Details: | 11. Personnel Coverage<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard.<br><br>**Opportunity for Improvement**<br>It is understood that the MECP has a new procedure for watermain disinfections. It may be beneficial to write how personnel coverage may be affected and how staffing may be rearranged to adjust. |
| DWQMS Reference:<br>Results:<br>Details: | 12. Communications<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 13. Essential Supplies and Services<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 14. Review and Provision of Infrastructure<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br><br>Details: | 15. Infrastructure Maintenance, Rehabilitation, and Renewal<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 16. Sampling, Testing, and Monitoring<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard. |
| DWQMS Reference:<br>Results:<br>Details: | 18. Emergency Management<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |

| | |
|---|---|
| Results:<br>Details: | **Opportunity for Improvement**<br>Section 18.2(2) refers to one or more water treatment plant operators being sick and further refers to SOP #2. SOP #2 was found to reference Pandemic Response rather than sick workers. This should be addressed with a revised SOP and the addition of a pandemic emergency situation section. |
| Results:<br>Details: | **Opportunity for Improvement**<br>Emergency management training appears to be limited. It would be beneficial for the QMS team to be involved with the Municipal Emergency Control Group mock exercises to practise life-like emergency situations |
| DWQMS Reference:<br>Results:<br>Details: | 19. Internal Audits<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 20. Management Review<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |
| DWQMS Reference:<br>Results:<br>Details: | 21. Continual Improvement<br>**Conforms**<br>The information provided in the Operational Plan meets the requirements of the standard |

**Interviews**

The following persons were interviewed as part of the Internal Audit:

- Craig Miller, Environmental Superintendent QMS Representative
- Travis Rob, Operations and Facilities Manager, QMS Representative Alternate
- Greg Wiedenhoeft, ORO Water Treatment Plant
- Paul Lemesurier, OIC Water Treatment Plant
- Jay Bruyere, OIT Water Treatment Plant
- Bryan Patterson, OIT Water Distribution
- Joel Nicolay, OIT Water Distribution
- Erik Gustafson, OIT Water Distribution
- Lori Pattison, Secretary

**Findings**

The following outlines the findings from the interviews of the above-mentioned personnel.

- Element 7 – Through interviews and discussions on Element 7 (Risk Assessment) it was found that between this audit and the next in 2022, the risk assessment for the hazards indicated in the plan will need to be completed from scratch as per the 36-month renewal schedule. It will be important to ensure all QMS team members are included in the preparation of the renewed risk assessments.
- Element 11 – Through interviews discussions on Element 11 it was found that the MECP issued new procedures for watermain disinfections, and it is understood that a certified water operator is required to be present when tying in new watermains to the municipal system. This element may need to be amended to include personnel distribution if manpower is affected due to these new procedures.
- Element 18 Emergency Management is current to the standard but offers an opportunity for improvement for completing a tabletop or mock exercise with the Emergency Community Control Group in the Town of Fort Frances. With new employees and management members, this would be a great learning opportunity. The OP speaks of completing a mock exercise but is not mandatory. Members of the QMS mentioned this as an interest in training procedures.

## Summary of Findings During the Audit Process

| SUMMARY OF FINDINGS | | | | |
|---|---|---|---|---|
| **Operating Authority** | | | | |
| The Town of Fort Frances | | | | |
| **Auditor** | **Date** | | | |
| Cody Vangel | July 29, 2021 | | | |
| **System (s)** | | | | |
| 1. The Town of Fort Frances Drinking Water System | | | | |
| **Requirement** | **System** | | | |
| | **1** | **2** | **3** | **4** |
| **1.** Quality Management System | **OFI** | | | |
| **2.** Quality Management System Policy | **C** | | | |
| **3.** Commitment and Enforcement | **OFI** | | | |
| **4.** Quality Management System Representative | **OFI** | | | |
| **5.** Document and Records Control | **OFI** | | | |
| **6.** Drinking-Water System | **OFI** | | | |
| **7.** Risk Assessment | **C** | | | |
| **8.** Risk Assessment Outcomes | **C** | | | |
| **9.** Organizational Structure, Roles, Responsibilities and Authorities | **OFI** | | | |
| **10.** Competencies | **C** | | | |
| **11.** Personnel Coverage | **OFI** | | | |
| **12.** Communications | **C** | | | |
| **13.** Essential Supplies and Services | **C** | | | |
| **14.** Review and Provision of Infrastructure | **C** | | | |
| **15.** Infrastructure Maintenance and Rehabilitation & Renewal | **C** | | | |
| **16.** Sampling, Testing and Monitoring | **C** | | | |
| **17.** Measurement & Recording Equipment Calibration and Maintenance | **C** | | | |
| **18.** Emergency Management | **OFI** | | | |
| **19.** Internal Audits | **C** | | | |
| **20.** Management Review | **C** | | | |
| **21.** Continual Improvement | C | | | |

| | |
|---|---|
| **C** | Conformance. In the opinion of the auditor this element is in conformance with the DWQMS. |
| **Mj** | Major non-conformity. The auditor has determined one of the following:<br>(a) a required element of the DWQMS has not been incorporated into a QMS;<br>(b) a systemic problem with a QMS is evidenced by two or more minor non-conformities; or<br>(c ) a minor non-conformity identified in a corrective action request has not been remedied |
| **Mn** | Minor non-conformity. In the opinion of the auditor, part of a required element of the DWQMS has not been incorporated satisfactorily into a QMS. |
| **OFI** | Opportunity for improvement. Conforms with the requirement, but there is an opportunity for improvement |

Cody Vangel, Lead Auditor

## APPENDIX

i. Cody Vangel Certificate of Qualification, Internal Auditor for DWQMS
ii. Internal Audit Schedule
iii. Internal Audit Opening Meeting Agenda
iv. Internal Audit Opening Meeting Minutes
v. DWQMS Checklists

Strategies for the Environment

S4E TRAINING

# Certificate of Completion

## Cody Vangel

Has successfully completed the
Internal Auditor for DWQMS; 13471
Director Approved under *O. Reg. 128/04* for 0.4 CEUs
April 22, 2020

Ivana Strgacic

Ivana Strgacic, P.Eng.
President

April 27, 2020

Date:

Strategies for the Environment

S4E TRAINING

# Certificate of Completion

## Cody Vangel

Has successfully completed the
Introduction to DWQMS; 13368
Director Approved under *O. Reg. 128/04* for 0.4 CEUs
April 22, 2020

Ivana Strgacic

Ivana Strgacic, P.Eng.
President

April 27, 2020

Date:

# Fort Frances Drinking Water System
# Internal Audit Schedule

| Internal Audit Schedule – Revised June 29, 2021 | | |
|---|---|---|
| **Start Date** | **End Date** | **Process** |
| June 29, 2021 | June 29, 2021 | Kick-off Meeting |
| June 30, 2021 | July 9, 2021 | Desktop Review |
| July 12, 2021 | July 14, 2021 | Interview Preparation |
| July 15, 2021 | July 21, 2021 | Interviews (July 15, 20, 21) |
| July 22, 2021 | July 28, 2021 | Final Report Preparation |
| July 29, 2021 | July 29, 2021 | Close-out Meeting – Report Submission |

# Fort Frances Drinking Water System
# Internal Audit Opening Meeting Agenda

**Date:** June 29, 2021
**Time:** 9:00 A.M
**Place:** Water Treatment Plant

## 1. Introduction

The Internal Audit begins today June 29, 2021 and is tentatively to be completed by July 30, 2021. This Internal Audit covers 21 elements of the DWQMS, the Town of Fort Frances Water Treatment Plant and Water Distribution System.

## 2. Internal Audit Schedule

| Internal Audit Schedule | | |
|---|---|---|
| **Start Date** | **End Date** | **Process** |
| June 29, 2021 | June 29, 2021 | Kick-off Meeting |
| June 30, 2021 | July 9, 2021 | Desktop Review |
| July 12, 2021 | July 14, 2021 | Interview Preparation |
| July 15, 2021 | July 21, 2021 | Interviews (July 15, 16, 20, 21) |
| July 22, 2021 | July 29, 2021 | Final Report Preparation |
| July 30, 2021 | July 30, 2021 | Close-out Meeting – Report Submission |

## 3. Confirm Interview List

Craig Miller, Travis Rob, Greg Wiedenhoeft, Paul Le Mesurier, Jay Bruyere, Bryan Patterson, Joel Nicolay, Erik Gustafson, Lori Pattison

## 4. Confirm Availability of Personnel for Interview

| July 15, 2021 | July 16, 2021 | July 20, 2021 | July 21, 2021 |
|---|---|---|---|
| Bryan Patterson<br>1:00pm – 1:30pm | Greg Wiedenhoeft<br>1:00pm – 1:30pm | Craig Miller<br>1:00pm – 1:30pm | contingency |
| Joel Nicolay<br>1:30pm – 2:00pm | Jay Bruyere<br>1:30pm – 2:00pm | Travis Rob<br>1:30pm – 2:00pm | contingency |
| Erik Gustafson<br>2:00pm – 2:30pm | Paul Le Mesurier<br>2:00pm – 2:30pm | Lori Pattison<br>2:00pm – 2:30pm | contingency |

## 5. Confirm time and location of Closing Meeting

Closing meeting will be proposed at the Water Treatment Plant July 30, 2021 at 9:00am.

# Fort Frances Drinking Water System
# Internal Audit Opening Meeting Minutes

**Date:** June 29, 2021
**Time:** Call to order at 9:07am
**Place:** Held virtually via Microsoft Teams
**Attendees:** Cody Vangel, Greg Wiedenhoeft, Paul Le Mesurier, Jay Bruyere, Craig Miller, Bryan Patterson, Lori Pattison, Erik Gustafson, Joel Nicolay

## 1. Introduction

Cody Vangel will conduct the internal audit.

The Internal Audit begins today June 29, 2021 and is scheduled to for completion by July 29, 2021.

The Internal Audit covers 21 elements of the DWQMS, the Town of Fort Frances Water Treatment Plant and Water Distribution System.

## 2. Internal Audit Schedule

The proposed Internal Audit Schedule has been revised and confirmed as follows:

| Internal Audit Schedule | | |
|---|---|---|
| **Start Date** | **End Date** | **Process** |
| June 29, 2021 | June 29, 2021 | Kick-off Meeting |
| June 30, 2021 | July 9, 2021 | Desktop Review |
| July 12, 2021 | July 14, 2021 | Interview Preparation |
| July 15, 2021 | July 21, 2021 | Interviews (July 15, 20, 21) |
| July 22, 2021 | July 28, 2021 | Final Report Preparation |
| July 29, 2021 | July 29, 2021 | Close-out Meeting – Report Submission |

## 3. Confirm Interview List

The interview list was confirmed as follows: Craig Miller, Travis Rob, Greg Wiedenhoeft, Paul Le Mesurier, Jay Bruyere, Bryan Patterson, Joel Nicolay, Erik Gustafson, Lori Pattison.

# Fort Frances Drinking Water System
# Internal Audit Opening Meeting Minutes

## 4. Confirm Availability of Personnel for Interview

The interview schedule has been revised and confirmed as follows:

| July 15, 2021 | July 20, 2021 | July 21, 2021 |
|---|---|---|
| Bryan Patterson<br>1:00pm – 1:30pm | Craig Miller<br>1:00pm – 1:30pm | Greg Wiedenhoeft<br>1:00pm – 1:30pm |
| Joel Nicolay<br>1:30pm – 2:00pm | Travis Rob<br>1:30pm – 2:00pm | Jay Bruyere<br>1:30pm – 2:00pm |
| Erik Gustafson<br>2:00pm – 2:30pm | Lori Pattison<br>2:00pm – 2:30pm | Paul Le Mesurier<br>2:00pm – 2:30pm |

## 5. Confirm time and location of Closing Meeting

Report submission and the closing meeting will be on July 29, 2021 at 9:00am. Location to be determined.

**Meeting close at 9:15am.**

Minutes prepared by Cody Vangel. Please report any errors or omissions to cvangel@fortfrances.ca

Fort Frances Drinking Water System
DWQMS Form

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | June 30, 2021 |
| Scope: | Element 1 - Quality Management System |
| People Interviewed: | QMS Team |

| Element: 1. Quality Management System | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – have the applicable element title/heading match that in the table of contents | Yes - OFI | |

PLAN – the Operating Authority shall document a Quality Management System that meets the requirements of this Standard

DO – The Operating Authority shall establish and maintain the Quality Management System in accordance with the requirements of this Standard and the policies and procedures documented in the Operational Plan.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Is there a plan - yes
  - Are all 21 elements covered in the Operational Plan? - yes
  - Are there procedures for all elements included in the Appendix? – only for applicable elements
  - Are the copies controlled? - yes

**Potential Interviews**

- QMS Representative
- Construction and Maintenance Supervisor
- Construction and Maintenance Staff
- Top Management

**Questions to Ask**

- Do you know what the Operational Plan is?
- Do you know where the Operational Plan?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | June 30, 2021 |
| Scope: | Element 2 - Quality Management System Policy |
| People Interviewed: | QMS Team |

| Element 2 - Quality Management System Policy | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| **DWQMS Requirements** | | Yes | |

PLAN – The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and:

a.) is appropriate for the size and type of the subject system,
b.) includes a commitment to the maintenance and continual improvement of the Quality Management System,
c.) includes a commitment to the consumer to provide safe drinking water,
d.) includes a commitment to comply with all legislation and regulations, and
e.) is in a form that provides for ready communication to all Operating Authority personnel, the Owner and the public.

DO – The Operating Authority shall establish and maintain a Quality Management System that is consistent with the Policy.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it contain the policy - yes
  - Does the policy meet the DWQMS Requirements – meets generally.
- DWQMS Policy
  - Where is it communicated (e.g. posters, website) – Operational plan hard copies, website, internal drives
- Communications Procedure – meets generally.

Is the public communication of the policy as per the Communications Policy? – yes, online or through Clerks office

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Construction and Maintenance Staff
Top Management

**Questions to Ask**

- Do you know where the policy is?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | June 30, 2021 |
| Scope: | Element 3 - Commitment and Endorsement |
| People Interviewed: | Travis Rob, Craig Miller |

| Element: 3. Commitment and Endorsement | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – the Town is undergoing a search to fill the CAO role. Upon selection of the new CAO, this endorsement should be updated with signature of the new CAO. | Yes - OFI | |

PLAN – The Operational Plan shall contain a written endorsement of its contents by top Management and the Owner

DO – Top Management shall provide evidence of its commitment to an effective Quality Management System by:

a.) ensuring that a Quality Management System is in place that meets the requirements of this Standard,
b.) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,
c.) communicating the Quality Management System according to the procedure for communications, and
d.) determining, obtaining or providing the resources needed to maintain and continually improve the Quality management System

**Associated Documents to Review**

- DWQMS Operational Plan
  - Is the plan endorsed (signature from Owners) - yes
  - Does Council have a copy of the report (meeting minutes- package supplied to council) - yes

- Communications Procedure
  - Council minutes - yes
  - Any minutes regarding communication with owner - yes

**Potential Interviews**

QMS Representative
Top Management

**Questions to Ask**

- How did you communicate to the owner?

- Are you aware of regulations/legislative standards?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | June 30, 2021 |
| Scope: | Element 4 - Quality Management System Representative |
| People Interviewed: | Craig Miller |

| Element: 4. **Quality Management System Representative** | **Notes/Findings** | **Degree of Conformance** | |
|---|---|---|---|
| | | **Conforms** | **Non-conforming** |
| **DWQMS Requirements** | OFI – have the applicable element title/heading match that in the table of contents | Yes - OFI | |

PLAN – The Operational Plan shall identify a Quality Management System representative.

DO – Top Management shall appoint and authorize a Quality Management System representative who, irrespective of other responsibilities, shall:

a.) administer the Quality Management System by ensuring that processes needed for the Quality Management System are established and maintained,
b.) report to Top Management on the performance of the Quality Management System and any need for improvement,
c.) ensure that the current version of documents required by the Quality Management System are being used at all times,
d.) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and
e.) promote awareness of the Quality Management System throughout the Operating Authority

**Associated Documents to Review**

- DWQMS Operational Plan -complete
- Document control procedure -complete

**Potential Interviews**

QMS Representative

**Questions to Ask**

- Has the QMS rep been authorized by Top Management
- How is QMS awareness promoted
- How do you ensure the current version of the document is used
- How are personnel aware of legislation/regulation
- How do you report to top management

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 5, 2021 |
| Scope: | Element 5 - Document and Records Control |
| People Interviewed: | Craig Miller, Lori Pattison |

| Element: 5. Document and Records Control | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – A grammatical correction that may be considered for item 5.2.(c)(3) is that the parentheses should be altered to read as follows:<br><br>A standard footer shall identify all QMS internal documents. This footer contains the following wording "Town of Fort Frances QMS Operational Plan" and the last revision date. | Yes - OFI | |

PLAN – The Operational Plan shall document a procedure for document and records control that describes how:

a.) documents required by the Quality Management System are:
   i. kept current, legible and readily identifiable
   ii. retrievable
   iii. stored, protected, retained and disposed of.

b.) Records required by the Quality Management System are:
   i. kept legible and readily identifiable
   ii. retrievable
   iii. stored, protected, retained and disposed of.

DO – The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes:

a.) the Operational Plan and its associated policies and procedures,

b.) documents and records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and

c.) the results of internal and external audits and management reviews

**Associated Documents to Review**

- DWQMS Operational Plan
  - Any documents referred to in the Operational Plan
    - Master list of Documents
    - Work Instructions
    - Equipment Manuals/Training Manuals
    - Drawings

- Records Control Procedure (records can't be changed) – any records referred to in the procedure
  - Review records – water quality test records, annual reports –

| |
|---|
| • Review retention times<br>• Review QMS related records – internal audits, minutes, calibration results.<br>• Review any records outlined in the Records Control procedure<br>• Review electronic records (e.g. weekly water quality summaries provided by lab)<br>• Document Control Procedure – any records referred to in the procedure<br>• Work instructions<br>• Procedures<br>• Equipment manuals |
| **Potential Interviews** |
| QMS Representative<br>Construction and Maintenance Supervisor<br>Construction and Maintenance Staff<br>Top Management<br>Tool Crib Person |
| **Questions to Ask** |
| • Can I see water quality records from 5 years ago?<br>• Can I see an annual audit?<br>• Can I see Management review minutes (example)?<br>• Can I see Emergency plan summaries?<br>• How do you request a change in an SOP?<br>• How are changes communicated?<br>• Are obsolete versions retained as per SOP – are they marked as obsolete?<br>• Where are current versions stored electronically? How is access controlled?<br>• Where are templates located?<br>• Can I see the equipment manuals? |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 5, 2021 |
| Scope: | Element 6 - Drinking-Water System |
| People Interviewed: | Paul LeMesurier, Greg Wiedenhoeft, Jay Bruyere, Bryan Patterson, Erik Gustafson, Joel Nicolay |

| Element: 6. Drinking-Water System | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – revise the introduction paragraph to include Friesen 5 at 121 Oakwood Road.<br><br>OFI - Revise 121 Oakwood Drive to 121 Oakwood Road.<br><br>OFI – Item 6.4 refers to a risk assessment under Element 8, this should read Element 7.<br><br>OFI – regarding item 6.5, address will change to 901 Agamiing Drive come January 1, 2022.<br><br>OFI – a legend detailing water supply lines and hydrants may be beneficial on the maps in Appendix "I".<br><br>OFI – in item 6.6 Colonization Road West Changing to Sunset Drive January 1, 2022.<br><br>OFI– describe fuel source for standby generator. (diesel, gasoline, propane, natural gas?) | Yes - OFI | |

PLAN – The Operational Plan shall document, as applicable:

a.) for the subject system:
- i. a description of the system including all treatment processes and distribution system components
- ii. the name of the Owner and the Operating Authority
- iii. a process flow chart
- iv. a description of the raw water source including:
  - i. general characteristics of the raw water supply
  - ii. common event-driven fluctuations and
  - iii. any resulting operational challenges and threats
  - v. a description of any critical upstream or downstream processes relied upon to ensure the provision of safe drinking water

b.) if the subject system is an operational subsystem, a summary description of the municipal residential drinking-water system it is a part of.

c.) If the subject system is connected to one or more other drinking-water systems owned by different owners, a summary of those systems which:
- i. indicates whether the subject system obtains water from or supplies water to those systems, and
- ii. names the Owner and Operating Authority of those systems.

DO – The Operating Authority shall ensure that the description of the drinking-water system is kept current.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does the plan contain a description - yes
  - Does the plan contain the names of owner/operators - yes

| |
|---|
| • Does it discuss challenges - yes<br>• Does it discuss upstream/downstream processes. - yes<br>• Does it discuss other owners systems? – n/a<br>• Is it current? - yes<br><br>• Water Distribution Map - yes<br><br>• MOE Inspection contains descriptions - yes |
| **Potential Interviews** |
| QMS Representative<br>Construction and Maintenance Supervisor<br>Construction and Maintenance Staff<br>Top Management |
| **Questions to Ask** |
| • Is the description up to date?<br>• Can I see most recent MOE Inspection Report? |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 5, 2021 |
| Scope: | Element 7 - Risk Assessment |
| People Interviewed: | Travis Rob, Craig Miller, Paul LeMesurier, Greg Wiedenhoeft, Jay Bruyere, Bryan Patterson, Erik Gustafson, Joel Nicolay |

| Element: 7. Risk Assessment | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a risk assessment process that:

a.) identifies potential hazardous events and associated hazards
b.) assesses the risks associated with the occurrence of hazardous events,
c.) ranks the hazardous events according to the associated risk,
d.) identifies control measures to address potential hazards and hazardous events,
e.) identifies critical control points,
identifies a method to verify at least once a year, the currency of the information and the validity of the assumptions used in the risk assessment,
f.) ensures that a risk assessment is conducted at least once every thirty-six months, and
g.) considers the reliability and redundancy of equipment.

DO – The Operating authority shall perform a risk assessment consistent with the documented process.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Critical Control Points – yes, also see element 8
- Risk Assessment Procedure
  - Emergency Response related work instructions – yes, also see element 8
- Risk Assessment Table
  - Are hazards ranked – yes, also see element 8
- Emergency Contact List
- Essential Service List

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Construction and Maintenance Staff
Top Management

**Questions to Ask**

- When was the last risk assessment completed?
- What are the critical control points?
- Can I see (documents)?
- When was the last emergency?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 5, 2021 |
| Scope: | Element 8 - Risk Assessment Outcomes |
| People Interviewed: | Travis Rob, Craig Miller, Paul LeMesurier, Greg Wiedenhoeft, Jay Bruyere, Bryan Patterson, Erik Gustafson, Joel Nicolay |

| Element: 8. Risk Assessment Outcomes | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | Yes | |

PLAN – The Operational Plan shall document:

a.) the identified potential hazardous events and associated hazards
b.) the assessed risks associated with the occurrence of hazardous events,
c.) the ranked hazardous events,
d.) the identified control measures to address the potential hazards and hazardous events,
e.) the identified critical control points and their respective critical control limits,
f.) procedures and/or processes to monitor the critical control limits,
g.) procedures to respond to deviations from the critical control limits, and
h.) procedures for reporting and recording deviations from the critical control limits.

DO – The Operating Authority shall implement and conform to the procedures.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Critical Control Points – yes
- Risk Assessment Procedure
  - Emergency Response related work instructions – yes
- Risk Assessment Table
  - Are hazards ranked – yes
- Emergency Contact List
- Essential Service List
- Are there procedures and/or processes to monitor the critical control limits – yes
- Are there procedures in place to respond to the critical control limits – yes
- Are there procedures in place for reporting and recording deviations from the critical control points – not directly in element

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Construction and Maintenance Staff
Top Management

**Questions to Ask**

- What are the critical control points?
- Can I see (documents)?
- When was the last emergency?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 6, 2021 |
| Scope: | Element 9 - Organizational Structure, Roles, Responsibilities and Authorities |
| People Interviewed: | QMS Team |

| Element: 9. Organizational Structure, Roles, Responsibilities and Authorities | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| **DWQMS Requirements** | OFI – OFEC appointment is under By-law 53/16, instead of 21/94<br><br>OFI – Emergency plan is located under "N" drive, not the "G" drive ("G" does not exist). The current plan under the "N" drive is outdated and needs to be updated. This is referenced in Secretary/Receptionist section.<br><br>OFI – the Operations and Maintenance manual in the WTP Control Room should be updated to indicate the new ORO. Existing manual shows the interim ORO from early 2021.<br><br>OFI – this element indicates that the CAO and Operations & Facilities Manager are both top management. Is this appropriate or should this only indicate one? | Yes - OFI | |

PLAN – the Operational Plan shall:

a.) describe the organisational structure of the Operating Authority including respective roles, responsibilities and authorities,
b.) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple subject systems,
c.) identify person, persons or group of people within the management structure of the organisation responsible for undertaking Management Review,
d.) identify the person, persons or group of people having Top Management Responsibilities required by this Standard, along with their responsibilities, and
e.) identify the Owner of the subject system.

DO – The Operating Authority shall keep current the description of the organisational structure including respective roles responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Review the structure, roles, responsibilities and authorities - yes
  - Is top management identified? - yes
  - Is the owner identified? - yes
  - Is it current? - yes

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Construction and Maintenance Staff
Top Management

| Questions to Ask |
| --- |
| • Talk to people listed and ask if they know their roles/responsibilities<br>• How are roles and responsibilities communicated? |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 6, 2021 |
| Scope: | Element 10 - Competencies |
| People Interviewed: | Travis Rob, Craig Miller, Greg Wiedenhoeft |

| Element: 10 Competencies | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document:

a.) competencies required for personnel performing duties affecting drinking water quality.
b.) activities to develop and maintain competencies for personnel performing duties directly affecting drinking water quality, and
c.) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.

DO – the Operating Authority shall undertake activities to:

a.) meet and maintain competencies for personnel directly affecting drinking-water quality and shall maintain records of these activities, and
d.) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it refer to competencies? - yes
- Competencies Procedure- yes
- Training Matrix
- Training Manuals (A Level Water Training, B Level Water Training)
- Training Records
- DWQMS Awareness (handouts, minutes)
- Emergency response meetings

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Supervisor – Training and Support
Construction and Maintenance Staff
Top Management
Manager of Operations

**Questions to Ask**

- Ask to see training matrix, manuals, records
- Ask staff if they know their responsibilities as they relate to safe drinking water

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 6, 2021 |
| Scope: | Element 11 - Personnel Coverage |
| People Interviewed: | Craig Miller, Greg Wiedenhoeft |

| Element: 11 Personnel Coverage | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – It is understood that the MECP has a new procedure for watermain disinfections. It may be beneficial to write how personnel coverage may be affected and how staffing may be rearranged. | yes | |
| PLAN – The Operational Plan shall document a procedure to ensure that sufficient personnel meeting the identified competencies are available for duties that directly affect drinking water quality,<br><br>DO – The Operating Authority shall implement and conform to the procedure. | | | |
| Associated Documents to Review | | | |
| • DWQMS Operational Plan<br>  • Does it discuss coverage? - yes<br>• Personnel Coverage SOP<br>  • Does it discuss coverage? – did not locate<br>• Call Schedule<br>• Collective Agreements | | | |
| Potential Interviews | | | |
| QMS Representative<br>Construction and Maintenance Supervisor<br>Manager Operations | | | |
| Questions to Ask | | | |
| • How is the call schedule communicated?<br>• How are changes to the schedule communicated? | | | |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 7, 2021 |
| Scope: | Element 12 - Communications |
| People Interviewed: | Craig Miller, Travis Rob, Lori Pattison |

| Element: 12 Communications | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and:

a.) the Owner,
b.) Operating Authority personnel,
c.) Suppliers, and
d.) The public.

DO – The Operating Authority shall implement and conform to the procedure.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss communications? - yes
- Communications SOP
  - Does it discuss coverage? – did not locate
- Meeting Minutes
- Communications with suppliers - yes

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Manager Operations
Construction and Maintenance Staff
Top Management

**Questions to Ask**

- How is the policy communicated
- How do you communicate with the owner
- How do you communicate with Operating Authority Personnel

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 7, 2021 |
| Scope: | Element 13 - Essential Supplies and Services |
| People Interviewed: | Craig Miller, Greg Wiedenhoeft |

| Element: 13 Essential Supplies and Services | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall:

a.) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and

b.) include a procedure by which the Operating Authority ensures the quality of the essential supplies and services, in as much as they may affect the drinking water quality.

DO – The Operating Authority shall implement and conform to the procedure.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss essential supplies and services? - yes
- Essential Supplies and Services Procedure
  - Does it discuss coverage? – generally indicates who two suppliers are for each product
- Communications Procedure
- Laboratory agreement ALS laboratory
- Purchasing Guide – documentation at WTP control room indicates purchasing schedules

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Top Management
Tool Crib Person
Senior Stock Keeper

**Questions to Ask**

- How are QMS requirements communicated
- How do you know that the supplies you order are what you receive
- What do you do if you don't get what you order

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 7, 2021 |
| Scope: | Element 14 - Review and Provision of Infrastructure |
| People Interviewed: | Travis Rob, Craig Miller |

| Element: 14 Review and Provision of Infrastructure | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a procedure for the annual review of the adequacy of the infrastructure necessary to operate and maintain the subject system.

DO – The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the owner.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss infrastructure - yes
- Review and Provision of Infrastructure Procedure
  - Any documents outlined
- 10 year Major Infrastructure Works Schedule – up to 2026 included in plan
- Work Management System/Infrastructure Management System for break history
- Equipment manuals

**Potential Interviews**

QMS Representative
Manager Operations
Asset Planning Manager
Top Management
Construction and Maintenance Supervisors

**Questions to Ask**

- How are infrastructure needs communicated to the Owner
- What maintenance information is tracked
- What are maintenance activities

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 7, 2021 |
| Scope: | Element 15 - Infrastructure Maintenance, Rehabilitation and Renewal |
| People Interviewed: | Travis Rob, Craig Miller |

| Element: 15 Infrastructure Maintenance, Rehabilitation and Renewal | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| **DWQMS Requirements** | | yes | |
| PLAN – The Operational Plan shall document a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system.<br><br>DO –The Operating Authority shall:<br>a.) keep the summary current,<br>b.) communicate the programs to the Owner, and<br>monitor the effectiveness of the maintenance program | | | |
| **Associated Documents to Review** | | | |
| • DWQMS Operational Plan<br>  • Does it discuss infrastructure – yes<br>• Review and Provision of Infrastructure Procedure<br>  • Any documents outlined<br>• Work Management System/Infrastructure Management System for break history<br>• Equipment manuals | | | |
| **Potential Interviews** | | | |
| QMS Representative<br>Manager Operations<br>Top Management<br>Construction and Maintenance Supervisors | | | |
| **Questions to Ask** | | | |
| • What maintenance information is tracked<br>• What are maintenance activities<br>• How is this communicated to the owner? | | | |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 16 - Sampling, Testing and Monitoring |
| People Interviewed: | Greg Wiedenhoeft, Paul Lemesurier, Jay Bruyere |

| Element: 16 Sampling, Testing and Monitoring | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document:

a.) a sampling, testing and monitoring procedure for process control and finished drinking water quality including the requirements for sampling, testing and monitoring at the conditions most challenging to the subject system

b.) a description of any relevant sampling, testing or monitoring activities that take place upstream of the subject system, and

c.) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.

DO – The Operating Authority shall implement and conform to the procedures.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss sampling, testing and monitoring – yes
- Sampling, Testing and Monitoring Procedure
  - Any work instructions/forms outlined
- Laboratory Agreement

**Potential Interviews**

QMS Representative
Manager Operations
Construction and Maintenance Supervisors
Construction and Maintenance staff

**Questions to Ask**

- What procedure do you use to take a chlorine residual?
- What procedure do you use to take a bacteriological sample?
- How do you make sure weekly chlorine residuals are taken?
- How do you make sure a sufficient number of samples are taken
- What do you do if you have an adverse sample?
- How do you check the samples
- How do you obtain a new sample location
- What do you do after a watermain break?

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 17 - Measurement and Recording Equipment, Calibration and Maintenance |
| People Interviewed: | Greg Wiedenhoeft, Paul Lemesurier, Jay Bruyere |

| Element: 17 Measurement and Recording Equipment, Calibration and Maintenance | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.

DO – The Operating Authority shall implement and conform to the procedure.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss measurement and recording equipment, calibration and maintenance – yes
- Calibration & maintenance of measurement and recording equipment procedure
  - Any work instructions/forms outlined
  - Review filled out records – yes

**Potential Interviews**

QMS Representative
Manager Operations
Construction and Maintenance Supervisors
Construction and Maintenance staff
Tool Crib Person

**Questions to Ask**

- Show me how you check chlorine meters/pH meters/ pressure gauges?
- What do you do if the pressure gauge is out of spec?
- What do you do if the chlorine meter is out of spec
- How often are chlorine meters verified
- Can I see the equipment manual/log sheets

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 18 - Emergency Management |
| People Interviewed: | QMS Team |

| Element: 18 Emergency Management | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | OFI – Section 18.2(2) refers to one or more water treatment plant operators being sick and further refers to SOP #2. SOP #2 was found to reference Pandemic Response rather than sick workers. This should be addressed with a revised SOP and the addition of a pandemic emergency situation section. | Yes - OFI | |

PLAN – The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes:

a.) a list of potential emergency situations or service interruptions,
b.) processes for emergency response and recovery,
c.) emergency response training and testing requirements,
d.) Owner and Operating Authority responsibilities during emergency situations,
e.) References to municipal emergency planning measures as appropriate, and
f.) An emergency communication protocol and an up-to-date list of emergency contacts.

DO – The Operating Authority shall implement and conform to the procedure.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does it discuss emergency management – yes
- Emergency management procedure
  - Any work instructions related – yes
- Emergency contact list – yes
- Records of Emergency response training and testing
- List of potential emergency situations or service interruptions – yes, SOP 1-6
- Risk assessment document
- Emergency Response Manual – yes

**Potential Interviews**

QMS Representative
Manager Operations
Construction and Maintenance Supervisors
Construction and Maintenance staff
Top Management

| Utilities Program Assistant |
| --- |
| **Questions to Ask** |
| • When was the last training for emergency response<br>• How are emergencies tested<br>• Where is the emergency response manual<br>• What are considered to be water related emergencies<br>• Who maintains emergency contact list<br>• When did you last test the XXX procedure<br>• Who is responsible to maintain the Emergency Procedure Manual<br>• How do you update the Key Customer list<br>How are key customers contacted |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 19 - Internal Audits |
| People Interviewed: | Travis Rob, Craig Miller |

| Element: 19 Internal Audits | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a procedure for internal audits that:

a.) evaluates the conformity of the QMS with the requirements of this Standard,
b.) identifies internal audit criteria, frequency, scope, methodology and record-keeping requirements,
c.) considers previous internal and external audit results, and
d.) describes how the Quality Management System corrective actions are identified and initiated.

DO – The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every twelve months.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does the plan refer to internal Audits – yes
- Internal Audit Procedure– yes
- Corrective Action Procedure– yes
- CARs– yes
- Internal audit schedule– yes
- Previous Internal Audit Checklists/Reports– yes
- Previous External Audit results
- Auditor training records– yes

**Potential Interviews**

QMS Representative
Construction and Maintenance Supervisor
Construction and Maintenance Staff
Top Management

**Questions to Ask**

- Was the Internal Audit report prepared within 7 days of the internal audit
- Show me how the CARs have been addressed

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 20 - Management Review |
| People Interviewed: | Travis Rob, Craig Miller |

| Element: 20 Management Review | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |

PLAN – The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of:

a.) incidents of regulatory non-compliance,
b.) incidents of adverse drinking-water tests,
c.) deviations form critical control point limits and response actions,
d.) the efficacy of the risk assessment process,
e.) internal and third party audit results,
f.) results of emergency response testing,
g.) operational performance,
h.) raw water supply and drinking water quality trends,
i.) follow-up action items from previous management reviews,
j.) the status of management action items identified between reviews,
k.) changes that could affect the Quality Management System,
l.) consumer feedback,
m.) the resources needed to maintain the Quality Management System,
n.) the results of infrastructure review,
o.) Operational Plan currency, content and updates, and
p.) Staff suggestions

Do - Top Management shall implement and conform to the procedure and shall:

a.) ensure that a management review is conducted at least once every twelve months,
b.) consider the results of the management review and identify deficiencies and action items to address the deficiencies,
c.) provide a record of any decisions and action items related to the management review
d.) including personnel responsible for delivering the action actions and the proposed timelines for their implementation, and
e.) report the results of management review, the identified deficiencies, decisions and action items to the Owner.

**Associated Documents to Review**

- DWQMS Operational Plan
  - Does the plan refer to management review– yes
- Management Review Procedure– yes

| |
|---|
| • Management Review Meeting Minutes<br>• Any action plans<br>• Council minutes |
| **Potential Interviews** |
| QMS Representative<br>Top Management |
| **Questions to Ask** |
| • When was the Management Review completed<br>• Do you have a record or minutes<br>• Was a summary provided to you<br>• How were the results of the review communicated to the Owner |

# Internal Audit Checklist

| | |
|---|---|
| Auditor: | Cody Vangel |
| Audit Date: | July 8, 2021 |
| Scope: | Element 21 - Continual Improvement |
| People Interviewed: | QMS Team |

| Element: 21 Continual Improvement | Notes/Findings | Degree of Conformance | |
|---|---|---|---|
| | | Conforms | Non-conforming |
| DWQMS Requirements | | yes | |
| DO – The Operating Authority shall continual strive to improve the effectiveness of its Quality Management System through the use of corrective actions. | | | |
| Associated Documents to Review | | | |
| • DWQMS Operational Plan<br>  • Does the plan refer to continual improvement – yes<br>• Continual Improvement Procedure | | | |
| Potential Interviews | | | |
| QMS Representative<br>Top Management | | | |
| Questions to Ask | | | |
| | | | |

# Audit Report

S2 Surveillance Audit for

The Corporation of the Town of Fort Frances

1631580-02

Audited Address: 320 Portage Avenue, Fort Frances, Ontario, CAN, P9A 2P9

Start Date: Nov 16, 2020  End Date: Nov 16, 2020

Type of audit - Surveillance System Audit

Issue Date: June 3, 2020
Revision Level: *Rev 13*

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## BACKGROUND INFORMATION

SAI Global conducted an audit of The Corporation of the Town of Fort Frances beginning on Nov 16, 2020 and ending on Nov 16, 2020 to DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017.

The purpose of this audit report is to summarise the degree of compliance with relevant criteria, as defined on the cover page of this report, based on the evidence obtained during the audit of your organization. This audit report considers your organization's policies, objectives, and continual improvement processes. Comments may include how suitable the objectives selected by your organization appear to be in regard to maintaining customer satisfaction levels and providing other benefits with respect to policy and other external and internal needs. We may also comment regarding the measurable progress you have made in reaching these targets for improvement.

SAI Global audits are carried out within the requirements of SAI Global procedures that also reflect the requirements and guidance provided in the international standards relating to audit practice such as ISO/IEC 17021-1, ISO 19011 and other normative criteria. SAI Global Auditors are assigned to audits according to industry, standard or technical competencies appropriate to the organization being audited. Details of such experience and competency are maintained in our records.

In addition to the information contained in this audit report, SAI Global maintains files for each client. These files contain details of organization size and personnel as well as evidence collected during preliminary and subsequent audit activities (Documentation Review and Scope) relevant to the application for initial and continuing certification of your organization.

Please take care to advise us of any change that may affect the application/certification or may assist us to keep your contact information up to date, as required by SAI Global Terms and Conditions.

This report has been prepared by SAI Global Limited (SAI Global) in respect of a Client's application for assessment by SAI Global. The purpose of the report is to comment upon evidence of the Client's compliance with the standards or other criteria specified. The content of this report applies only to matters, which were evident to SAI Global at the time of the audit, based on sampling of evidence provided and within the audit scope. SAI Global does not warrant or otherwise comment upon the suitability of the contents of the report or the certificate for any particular purpose or use. SAI Global accepts no liability whatsoever for consequences to, or actions taken by, third parties as a result of or in reliance upon information contained in this report or certificate.

Please note that this report is subject to independent review and approval. Should changes to the outcomes of this report be necessary as a result of the review, a revised report will be issued and will supersede this report.

| | |
|---|---|
| **Standard:** | DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017 |
| **Scope of Certification:** | Drinking Water |
| **Drinking Water System Owner:** | Town of Fort Frances |
| **Operating Authority:** | Town of Fort Frances |
| **Population Services:** | 8,230 |
| **Activities:** | Treatment and distribution |
| **Drinking Water Systems** | Fort Frances drinking water system |
| **Standard:** | DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017 |

| | | |
|---|---|---|
| **Total audit duration:** | **Person(s):** 1 | **Day(s):** 0.75 |
| **Audit Team Member(s):** | Team Leader | Rod Seabrook |

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**Definitions and action required with respect to audit findings**

**Major Non-conformance**:

Based on objective evidence, the absence of, or a significant failure to implement and/or maintain conformance to requirements of the applicable standard. Such issues may raise significant doubt as to the capability of the management system to achieve its intended outputs (i.e. the absence of or failure to implement a complete Management System clause of the standard); or

A situation which would on the basis of available objective evidence, raise significant doubt as to the capability of the Management System to achieve the stated policy and objectives of the customer.

NOTE: The "applicable Standard" is the Standard which SAI Global are issuing certification against, and may be a Product Standard, a management system Standard, a food safety Standard or another set of documented criteria.

Action required: This category of findings requires SAI Global to issue a formal NCR; to receive and approve client's proposed correction and corrective action plans; and formally verify the effective implementation of planned activities. Correction and corrective action plan should be submitted to SAI Global prior to commencement of follow-up activities as required. Follow-up action by SAI Global must 'close out' the NCR or reduce it to a lesser category within 90 days for initial certification and within 60 days for surveillance or re-certification audits, from the last day of the audit.

If significant risk issues (e.g. safety, environmental, food safety, product legality/quality, etc.) are detected during an audit these shall be reported immediately to the Client and more immediate or instant correction shall be requested. If this is not agreed and cannot be resolved to the satisfaction of SAI Global, immediate suspension shall be recommended.

In the case of initial certification, failure to close out NCR within the time limits means that the Certification Audit may be repeated.

If significant risk issues (e.g. safety, environmental, food safety, product legality/quality, etc.) are detected during an audit these shall be reported immediately to the Client and more immediate or instant correction shall be requested. If this is not agreed and cannot be resolved to the satisfaction of SAI Global, immediate suspension shall be recommended.

In the case of an already certified client, failure to close out NCR within the time limits means that suspension proceedings may be instituted by SAI Global.

Follow-up activities incur additional charges.

**Minor Non-conformance:**

Represents either a management system weakness or minor issue that could lead to a major nonconformance if not addressed. Each minor NC should be considered for potential improvement and to further investigate any system weaknesses for possible inclusion in the corrective action program

Action required: This category of findings requires SAI Global to issue a formal NCR; to receive and approve client's proposed correction and corrective action plans; and formally verify the effective implementation of planned activities at the next scheduled audit.

**Opportunity for Improvement:**

A documented statement, which may identify areas for improvement however shall not make specific recommendation(s).

Action required: Client may develop and implement solutions in order to add value to operations and management systems. SAI Global is not required to follow-up on this category of audit finding.

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## Audit Type and Purpose

### Surveillance Audit:

A systems desktop audit in accordance with the systems audit procedure as it applies to Full Scope accreditation. The audit also included consideration of the results of the most recent audit undertaken in accordance with this Accreditation Protocol and any of the following that have occurred subsequent to that audit including but limited to;

(a) the results of any audits undertaken in accordance with element 19 of the DWQMS V2;

(b) historical responses taken to address corrective action requests made by an Accreditation Body;

(c) the results of any management reviews undertaken in accordance with element 20 of the DWQMS V2; and,

(d) any changes to the documentation and implementation of the QMS.

### Audit Objectives

The objective of the audit was to determine whether the drinking water Quality Management System (QMS) of the subject system conforms to the requirements of the Ontario Ministry of the Environment & Climate Change (MOECC) Drinking Water Quality Management Standard (DWQMS V2). The audit was also intended to gather the information necessary for SAI Global to assess whether accreditation can continue or be offered or to the operating authority.

### Audit Scope

The facilities and processes associated with the operating authority's QMS were objectively evaluated to obtain audit evidence and to determine a) whether the quality management activities and related results conform with DWQMS V2 requirements, and b) if they have been effectively implemented and/or maintained.

### Audit Criteria:

- The Drinking Water Quality Management Standard Version 2
- Current QMS manuals, procedures and records implemented by the Operating Authority
- SAI Global Accreditation Program Handbook

### Confidentiality and Documentation Requirements

SAI Global stores their records and reports to ensure their preservation and confidentiality. Unless required by law, SAI Global will not disclose audit records to a third party without prior written consent of the applicant. The only exception will be that SAI Global will provide audit and corrective action reports to the Ontario Ministry of the Environment. For more information, please refer to the SAI Global Accreditation Program Handbook.

As part of SAI Global Terms, it is necessary for you to notify SAI Global of any changes to your Quality Management System that you believe are significant enough to risk non-conformity with DWQMS V2: For more information, please refer to the SAI Global Accreditation Program Handbook.

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## EXECUTIVE OVERVIEW

Based on the results of this surveillance system audit the management system remains effectively implemented and meets the requirements of the standard relative to the scope of certification; therefore, a recommendation for continued certification will be submitted.

### Opportunities for Improvement:

None.

### Management System Documentation

The management systems operational plan(s) was reviewed and found to be in conformance with the requirements of the standard.

### Management Review

Records of the most recent management review meetings were verified and found to meet the requirements of the standard. All inputs were reflected in the records, and appear suitably managed as reflected by resulting actions and decisions.

.

### Internal Audits

Internal audits are being conducted at planned intervals to ensure conformance to planned arrangements, the requirements of the standard and the established management system.

### Corrective, Preventive Action & Continual Improvement Processes

The Operating Authority is implementing an effective process for the continual improvement of the management system through the use of the quality policy, quality objectives, audit results, data analysis, the appropriate management of corrective and preventive actions and management review.

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## Summary of Findings

| | |
|---|---|
| **1.** Quality Management System | Conforms |
| **2.** Quality Management System Policy | Conforms |
| **3.** Commitment and Endorsement | Conforms |
| **4.** Quality Management System Representative | Conforms |
| **5.** Document and Records Control | Conforms |
| **6.** Drinking-Water System | Conforms |
| **7.** Risk Assessment | Conforms |
| **8.** Risk Assessment Outcomes | Conforms |
| **9.** Organizational Structure, Roles, Responsibilities and Authorities | Conforms |
| **10.** Competencies | Conforms |
| **11.** Personnel Coverage | Conforms |
| **12.** Communications | Conforms |
| **13.** Essential Supplies and Services | Conforms |
| **14.** Review and Provision of Infrastructure | Conforms |
| **15.** Infrastructure Maintenance, Rehabilitation & Renewal | Conforms |
| **16.** Sampling, Testing and Monitoring | Conforms |
| **17.** Measurement & Recording Equipment Calibration and Maintenance | Conforms |
| **18.** Emergency Management | Conforms |
| **19.** Internal Audits | ******** |
| **20.** Management Review | Conforms |
| **21.** Continual Improvement | Conforms |

| | |
|---|---|
| Major NCR # | Major non-conformity. The auditor has determined one of the following:<br>(a) a required element of the DWQMS has not been incorporated into a QMS;<br>(b) a systemic problem with a QMS is evidenced by two or more minor non-conformities; or<br>(c) a minor non-conformity identified with a corrective action request has not been remedied. |
| Minor NCR # | Minor non-conformity. In the opinion of the auditor, part of a required element of the DWQMS has not been incorporated satisfactorily into a QMS. |
| OFI | Opportunity for improvement. Conforms to requirement, but there is an opportunity for improvement. |
| Conforms | Conforms to requirement. |
| NANC | Not applicable/Not Covered during this audit. |
| ******** | Additional comment added by auditor in the body of the report. |

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## PART D. Audit Observations, Findings and Comments

| | |
|---|---|
| DWQMS Reference: | 1 Quality Management System |
| Client Reference: | Operational Plan Rev 13 |
| Details: *The Operational Plan documents a Quality Management System that meets the requirements of DWQMS V2.0 and the QMS is being maintained* | |

| | |
|---|---|
| DWQMS Reference: | 2 Quality Management System Policy |
| Client Reference: | Operational Plan Section 2 Rev 9 |
| Details: *Documented policy contains the three commitments required by the Standard* | |

| | |
|---|---|
| DWQMS Reference: | 3 Commitment and Endorsement |
| Client Reference: | Operational Plan Section 3 Rev 5 |
| Details: ***Commitment and endorsement signed by Owner/OA Nov 2019*** | |

| | |
|---|---|
| DWQMS Reference: | 4 Quality Management System Representative |
| Client Reference: | Operational Plan Section 4 Rev 5 |
| Details: *QMS rep, QMS alternate rep and QMS team established with documented responsibilities assigned to each* | |

| | |
|---|---|
| DWQMS Reference: | 5 Document and Record Control |
| Client Reference: | Operational Plan Section 5 Rev 10 |
| Details: *Procedure covers creation, approval, storage, protection, revisions, removal from use and retention for documents and records; management of external documents; Document and Record Master Control Table current Apr 12, 2019* | |

| | |
|---|---|
| DWQMS Reference: | 6 Drinking Water System |
| Client Reference: | Operational Plan Section 6 Rev 10; App I Rev 9; Schedule C |
| Details: *Source Upper Rainy River; raw water characteristics listed; Owner and Operating Authority Town of Fort Frances; Class III water treatment, Class II distribution system; four subsystems and five additional connections to the system listed; processes described; distribution system includes elevated storage tank; threats and fluctuations discussed; process flow diagram current Jun 03, 2016; maps of distribution system* | |

| | |
|---|---|
| DWQMS Reference | 7 Risk Assessment |
| Client Reference: | Operational Plan Section 7 Rev 6 |
| Details: *Procedure includes consideration of potential hazards/hazardous events, including those identified by MECP, process under consideration listed; risk assessment rating (likelihood, severity, detectability); threshold value of 8 for critical control points; risk assessment conducted every 36 month and reviewed annually* | |

| | |
|---|---|
| DWQMS Reference: | 8 Risk Assessment Outcomes |
| Client Reference: | Operational Plan Section 8 Rev 10 |
| Details: *Risk assessment outcomes current Apr 12, 2019; assessment includes consideration of MECP potential hazardous events; three CCPs identified; critical control limits established as appropriate; controls developed (EPR or SOP); management review minutes state last review held Mar/Apr 2020 – no changes* | |

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| | |
|---|---|
| DWQMS Reference: | 9 Organizational Structure, Roles, Responsibility and Authorities |
| Client Reference: | Operational Plan Section 9 Rev 5 |
| Details: *Org chart dated Apr 12, 2019; responsibilities and authorities described for all positions* | |

| | |
|---|---|
| DWQMS Reference: | 10 Competencies |
| Client Reference: | Operational Plan Section 10, Rev 5 |
| Details: *Competencies and qualifications described for positions directly affecting drinking water; processes listed for ensuring competencies* | |

| | |
|---|---|
| DWQMS Reference: | 11 Personnel Coverage |
| Client Reference: | Operational Plan Section 11, Rev 6 |
| Details: *Water Treatment Plant normally staffed with three employees (Overall Responsible Operator (ORO). One is the Operator-In-Charge (OIC) and a water distribution system employee (fully qualified or OIT); treatment plant manned 7:30 a.m. – 4:00 p.m. Monday to Friday; rotating on-call schedule established; designated and interim OROs; plant alarmed; agreement with OCWA to provide assistance as required* | |

| | |
|---|---|
| DWQMS Reference: | 12 Communications |
| Client Reference: | Operational Plan Section 12 Rev 4 |
| Details: *Processes described for communications with the Owner, staff, suppliers and the public; Operational Plan available on Town website https://www.fortfrances.ca/town/operations-facilities/water-sewer* | |

| | |
|---|---|
| DWQMS Reference: | 13 Essential Supplies and Services |
| Client Reference: | Operational Plan Section 13, Rev 10 |
| Details: *Chemical suppliers meet ANSI/ANAB standards; labs must be accredited; licensing, accreditation and specifications in purchasing contracts; list of essential supplies and services current Apr 12, 2019* | |

| | |
|---|---|
| DWQMS Reference: | 14 Review and Provision of Infrastructure |
| Client Reference: | Operational Plan Section 14 Rev 5 |
| Details: *Annually Environmental & Facilities Superintendent meets with operations staff; inputs to review described including risk assessment outcomes; meeting minutes prepared and distributed; 5 year cost projections prepared and reviewed by management; budget presented and reviewed by owner; budget endorsed by owner subject to review outcome* | |

| | |
|---|---|
| DWQMS Reference: | 15 Infrastructure Maintenance, Rehabilitation and Renewal |
| Client Reference: | Operational Plan Section 15 Rev 9; App C Rev 9; App H Rev 9 |
| Details: *Maintenance schedules prepared and implemented for water treatment plant and distribution system; records of planned and unplanned maintenance maintained; 5 year capital projection for rehabilitation, renewal and routine maintenance activities;* ***five year capital forecast (2017 - 2021) in the Operational Plan is not current*** | |

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| | |
|---|---|
| DWQMS Reference: | 16 Sampling, Testing and Monitoring |
| Client Reference: | Operational Plan Section 16 Rev 10 |
| Details: *Sampling program as per O. Reg. 170/03 and drinking water licence for treatment and distribution; sampling plan prepared dated Apr 12, 2019; accredited laboratory used for analysis; SCADA continuous online sampling; daily in-house testing by operators; monthly and annual reports prepared and submitted* | |

| | |
|---|---|
| DWQMS Reference: | 17 Measurement and Recording Equipment Calibration and Maintenance |
| Client Reference: | Operational Plan Section 17 Rev 5 |
| Details: *Annual calibrations of meters and analyzers conducted by qualified outside contractor; continuous water quality analyzers also calibrated by qualified in-house staff; records retained* | |

| | |
|---|---|
| DWQMS Reference: | 18 Emergency Management |
| Client Reference: | Operational Plan Section 17 Rev 10 |
| Details: *Six potential emergency situations/services interruptions identified; emergency response procedures prepared (previously audited); link to municipal emergency response described; annual training and testing conducted; emergency contact list in emergency response binder (not viewed)* | |

| | |
|---|---|
| DWQMS Reference: | 19 Internal Audits |
| Client Reference: | Operational Plan Section 19 Rev 4 |
| Details: *Internal audits conducted by qualified internal or external auditors; all elements audited at least every 12 months; audit checklist prepare/utilized; report prepared; results communicated; CARs prepared/addressed and records maintained*<br><br>*Internal audit conducted Jun/Jul 2020; qualified internal auditor utilized; Version 2.0 of Standard audited; checklist and audit report completed; summary of observations and table of findings*<br><br>***NOTE; several comments appear to be opportunities for improvement that were not captured in the summary table of findings*** | |

| | |
|---|---|
| DWQMS Reference: | 20 Management Review |
| Client Reference: | Operational Plan Section 20 Rev 5 |
| Details: *Top management review QMS once per 12 months; required participants listed; mandatory inputs required by Standard listed; review process and outputs described; records retained*<br><br>*Management review conducted Aug 27, 2020 covering period Jun 1, 2019 to May 31, 2020; all required topics covered; minutes recorded; summary report to mayor and council prepared; five action items identified for review by Owner* | |

| | |
|---|---|
| DWQMS Reference: | 21 Continual Improvement |
| Client Reference: | Operational Plan Section 21 Rev 4 |
| Details: *Key processes identifying non-conformances and opportunities for improvement and assessing root cause and developing corrective and preventive actions prepared; BMPs reviewed annually during management review; CAR log current* | |

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Details regarding the personnel interviewed and objective evidence reviewed are maintained on file at SAI Global.

This report was prepared by:

Rod Seabrook
SAI Global Management Systems Auditor

The audit report is distributed as follows:

- SAI Global
- Operating Authority
- Owner
- MOECC

## Notes

Copies of this report distributed outside the organization must include all pages.

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# CERTIFICATE OF ACCREDITATION

This is to certify that the following operating authority:

## The Corporation of the Town of Fort Frances

320 Portage Avenue**,** Fort Frances, Ontario P9A 2P9 Canada

**Refer to Attachment to Certificate of Accreditation dated November 19, 2020 for additional drinking water systems**

operates a

## Quality Management System

which conforms with the requirements of

**DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017**

for the following scope of accreditation

**Full Scope - Entire DWQMS**

| | | | |
|---|---|---|---|
| Certificate No.: | CERT-0132926 | Original Certification Date: | December 7, 2012 |
| File No.: | 1631580 | Certification Effective Date: | November 16, 2020 |
| Issue Date: | November 19, 2020 | Certification Expiry Date: | February 17, 2022 |

Heather Mahon
Global Head of Technical Services
SAI Global Assurance

**DWQMS 2017**

**Accredited by:**
**QMI-SAI Canada Limited (SAI Global)**, 20 Carlson Court, Suite 200, Toronto, Ontario M9W 7K6 Canada**.** This registration is subject to the **SAI Global** Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment**, SAI Global** accepts responsibility only for proven negligence. This certificate remains the property of **SAI Global** and must be returned to them upon request.
To verify that this certificate is current, please refer to the **SAI Global** On-Line Certification Register:
https://www.saiglobal.com/en-us/assurance/auditing_and_certification/certification_registry/

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# ATTACHMENT TO

# CERTIFICATE OF ACCREDITATION

These sites are accredited under Certificate No: CERT-0132926 issued on November 19, 2020

| File No. | | Effective Date |
|---|---|---|
| 1631580 | **The Corporation of the Town of Fort Frances**<br>320 Portage Avenue, Fort Frances, Ontario P9A 2P9 Canada | November 16, 2020 |

**Drinking Water Systems**

| | Site No. | Site Name |
|---|---|---|
| Yes | 1633091 | Fort Frances Drinking Water System |

These accreditations are dependent on The Corporation of the Town of Fort Frances (File No. 1631580) maintaining their scope of registration to DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017

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# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Update page 19 and 23 correcting and changing "Northeast" to "Southeast".

**Justification for Changes:**

The previous revision incorrectly indicated that the intake structure was Northeast of the WTP.

**Proposed Changes:**

As above.

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #1 – Applicable to Element #6 page 19 and 23.

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Update coverage description and alarm notifications.

**Justification for Changes:**

To properly describe the current operation and to add the additional contact of the PW on-call staff as a back up contact.

**Proposed Changes:**

Reflected current staffing at the plant and on-call personnel.

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #2 – Applicable to Element #11 page 51.

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Update budgeting timeline statement in 2nd last paragraph on page 59.

**Justification for Changes:**

Previous statement linked the review of the budget document to a specific O&F meeting. The proposed change links the review to the overall budget process.

**Proposed Changes:**

"…in accordance with the approved annual budget timeline."

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #3 – Applicable to Element #14 page 59.

_____

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Update daily, weekly and monthly tasks.

**Justification for Changes:**

Update the daily, weekly and monthly tasks to reflect what is actually done.

**Proposed Changes:**

- Add "as needed" to hypochlorite ops at water tower (daily)
- Add monitor for harmful algae blooms (daily)
- Remove yard maintenance (weekly)
- Remove water meter repairs / installs (weekly)
- Add monitor backwash TSS and Cl2 residuals (monthly)

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #4 – Applicable to Appendix C

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Switch tasks vi and vii under section B

**Justification for Changes:**

Tasks are not listed in correct order.

**Proposed Changes:**

- As above

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #5 – Applicable to Appendix D

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Add verbiage indicating that adverse test results and subsequent notification requirements are as dictated by the MECP, SAC and MOH/NWHU.
2. Update cellular phone numbers to match current staffing.

**Justification for Changes:**

1. The Town is directed by provincial agencies when adverse test results occur and the notification requirements are as per other agencies, not Town procedures.
2. Retirements have resulted in staffing changes and contact info needs to be updated.

**Proposed Changes:**

- As above

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #6 – Applicable to Appendix E

# DOCUMENT CHANGE REQUEST FORM

**Requested By:** QMS Team **Date:** June 18, 2021

**Department:** O. & F. Division

**Type of Change:**

**X Edit Existing Document** ☐ **Create New Document** ☐ **Delete Document**

**Changes Requested:**

1. Update capital plan to reflect current priorities.

**Justification for Changes:**

1. The capital plan was updated in Nov 2020.

**Proposed Changes:**

- Attach current capital 5 year plan.

**Approval:**

**QMS Representative:** _____ **Date:** _____

**Comments:** 2021 DCR #7 – Applicable to Appendix H