

Public Water System Annual Report

-2022-

Name of the Public Water System: **G3 Regional Water Co-op**

Name of the Legal Owner: **G3 Regional Water Co-operative Inc.**

Contact Person: **Jim Manchur**

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Name of Operators: **Mr. Ivan Yakimishen**

Phone during business hours: **(204) 548-4561**



Date Prepared: May 2023

Jim Manchur
Chair
G3 Regional Water Co-op Inc.

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1. Introduction:

The 2022 G3 Regional Water Co-op Annual Report summarizes the water utility's ability to provide safe potable water and comply with provincial regulations.

2. Description of the Water System

The G3 Water Co-op provides potable drinking water to a population of approximately 2500 residents within the Municipalities of Grandview and Gilbert Plains, as well as supplying water to approximately 485 residents in the RM of Dauphin. No corrective actions or emergency reporting was required. Full sampling results are attached in Appendix A.

The G3 Regional Co-op water system consists of two wells, raw water supply pipeline, water treatment plant (WTP), and a network of distribution pipelines.

2.1. *Water Supply Source*

The G3 Regional Water Co-op receives its raw water supply from two 300 mm groundwater wells. The wells are located approximately 1 km north of the WTP on municipal right-of-way west of the NW 26-26-23 W. One well can supply the system, however a fully equipped and redundant back-up well is provided to ensure supply can be maintained at all times.

2.2 *Water Treatment Process*

The treatment system is comprised of: two parallel RO membrane filtration skids; manganese greensand bypass filter; and forced air degasification for carbon dioxide (CO₂) removal to provide pH adjustment. The treatment system ensures that the water meets the *Guidelines for Canadian Drinking Water Quality* and the provincial *Drinking Water Safety Act*.

The water treatment process is designed to reduce iron and manganese concentrations, ammonia reduction, and reduce hardness to an acceptable level. Iron and manganese are metals that cause laundry and plumbing fixture staining problems, and can build up in the distribution pipes and cause reduced flow. Calcium carbonate (CaCO₃) causes hardness in water which diminishes the ability of the water to react with soap and form lather. Hardness also forms scale deposits in kettles and hot water tanks which can reduce the life expectancy of these appliances. Ammonia creates a high chlorine demand and complicates water disinfection where free chlorine residual must be maintained as the primary disinfectant.

Since membranes are capable of removing most of the hardness ions, a percentage of the raw water bypasses the membrane system and is filtered through a 2.1 m diameter manganese greensand pressure filter. Water passing through the pressure

filter is blended with membrane permeate to produce the desired finished water hardness of approximately 100 mg/L (as CaCO₃).

The membranes reject approximately 25% concentrate water to Sulfur Spring Creek as permitted by Environment Act Licence No. 2853.

Potassium Permanganate is injected prior to the green sand filter to oxidize iron and manganese. Iron is precipitated and filtered out, while manganese is removed mostly by adsorption within the green sand layer of the pressure filter.

Antiscalent is injected in the membrane raw water supply to minimize RO membrane fouling by sequestering dissolved metals and minerals during the treatment and concentrate phases. Since membranes remove dissolved minerals, water stabilization through pH adjustment is required to produce a non-corrosive treated water supply. Forced air degasification is used to remove dissolved CO₂, which provides an efficient and economical method to increase pH while minimizing sodium hydroxide chemical usage.

The raw water supply contains ammonia which, unless removed through the treatment system, interferes with chlorine disinfection capability. Ammonia is removed through membrane treatment but not typically through the greensand filter. Chlorine for disinfection is added to maintain an adequate free chlorine residual concentration in the reservoir. Plant operators are required to test the water several times throughout the day at various points within the WTP to ensure break-point chlorination, required for water safety, is being achieved.

Treated water is stored in a 1.2 ML, three-cell reinforced concrete reservoir. The reservoir is equipped with ultrasonic level control and monitored with a SCADA system. The SCADA system also has the capability of monitoring and controlling reservoir levels located in the Grandview and Gilbert Plains, and can monitor flow and pressures at booster stations in Mun. of Gilbert Plains and RM of Dauphin.

Corrosion inhibitor is added to the Municipality of Gilbert Plains line at their request to sequester any remaining metals in a dissolved state to minimize the probability of discoloured water in the distribution system.

A schematic of the water treatment process can be found in Appendix B.

2.3 Classification and Certification

The G3 Water Treatment Plant is a Class 2 Facility and the G-3 Water Distribution System is a Class 2 System. The lead operator is classified as Class 2 treatment and Class 2 distribution. The facility classifications are used to determine certification

requirements for the water system operators as per the Manitoba Environment's Water and Wastewater Facility Operators Regulation under the Environment Act.

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the Health Canada *Guidelines for Canadian Drinking Water Quality*. The G3 system is to meet the water quality standards as set in the G3 Operating License Table 1: Water Quality/Treatment Standards (see Table 1 below). The health-based parameters express the maximum acceptable concentrations for drinking water. Concentration values in excess of the guidelines constitute a health-related issue and require corrective actions.

Complete water chemistry analysis is only required every three years, however, testing was performed in 2022 and health based parameters were within the limits for the G3 Regional Water System (see Appendix A). Public water systems are required to monitor chlorine levels and undertake regular bacterial testing. The G3 system met all requirements for water quality standards and monitoring requirements in 2022, and is fulfilling the requirements of their Operating Licence.

Table 1: Water Quality/Treatment Standards

| Parameter | Quality Standard |
|---------------------|--|
| Total coliform | Less than one total coliform bacteria detectable per 100 mL in all treated and distributed water |
| <i>E. coli</i> | Less than one <i>E. coli</i> bacteria detectable per 100 mL in all treated and distributed water |
| Chlorine Residual | A free chlorine residual of at least 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes A free chlorine residual of at least 0.1 mg/L at all times at any point in the water distribution system |
| Arsenic | Less than or equal to 0.01 mg/L |
| Benzene | Less than or equal to 0.005 mg/L |
| Ethylbenzene | Less than or equal to 0.14 mg/L |
| Fluoride | Less than or equal to 1.5 mg/L |
| Lead | Less than or equal to 0.005 mg/L |
| Manganese | Less than or equal to 0.12 mg/L |
| Nitrate | Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen) |
| Nitrite | Less than or equal to 3 mg/L measured as nitrite (1 mg/L measured as nitrogen) |
| Trichloroethylene | Less than or equal to 0.005 mg/L |
| Tetrachloroethylene | Less than or equal to 0.01 mg/L |
| Toluene | Less than or equal to 0.06 mg/L |
| Total Xylenes | Less than or equal to 0.09 mg/L |
| Uranium | Less than or equal to 0.02 mg/L |

4. Water System Incidents and Corrective Actions

There were no major water system incidents in 2022. There were no corrective actions or emergency reporting required.

5. Drinking Water Safety Orders, Warnings, and Charges

There were no Drinking Water Safety Orders or warnings issued in 2022, nor were any charges laid on the system.

6. Major Expenses Incurred

There were no major expenses for the G3 Regional Water System in 2022.

7. Future System Expansion

The water distribution system will continue expansion into the RM of Dauphin (at their cost for capital expenditures), and is a growing customer of the G-3 Co-op.

The G-3 member municipalities plan to continue expansion of their distribution networks as funding opportunities arise and finances are available.

Appendix A

Results of Water Chemistry, Bacterial and Chlorine Residual Analysis



Chlorine Residual and TC/EC Analyses

| Collection Date | Sample Identification | TC | EC | CL2 Free | CL2 Total |
|-----------------|------------------------------------|----|----|----------|-----------|
| 2022-01-04 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-01-04 | G3 2 - TREATED | 0 | 0 | 0.92 | 0.98 |
| 2022-01-04 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.85 | 0.89 |
| 2022-01-19 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-01-19 | G3 2 - TREATED | 0 | 0 | 1.07 | 1.13 |
| 2022-01-19 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.87 | 0.94 |
| 2022-02-02 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-02-02 | G3 2 - TREATED | 0 | 0 | 0.97 | 1.06 |
| 2022-02-02 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.82 | 0.86 |
| 2022-02-15 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-02-15 | G3 2 - TREATED | 0 | 0 | 0.85 | 0.90 |
| 2022-02-15 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 1.01 | 1.03 |
| 2022-03-01 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-03-01 | G3 2 - TREATED | 0 | 0 | 0.96 | 1.04 |
| 2022-03-01 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.90 | 0.94 |
| 2022-03-15 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-03-15 | G3 2 - TREATED | 0 | 0 | 0.99 | 1.04 |
| 2022-03-15 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.86 | 0.89 |
| 2022-03-29 | G3 1 - RAW | 0 | 0 | na | Na |
| 2022-03-29 | G3 2 - TREATED | 0 | 0 | 0.93 | 1.00 |
| 2022-03-29 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.91 | 0.96 |
| 2022-04-12 | G3 1 - RAW | 0 | 0 | na | Na |
| 2022-04-12 | G3 2 - TREATED | 0 | 0 | 0.99 | 1.06 |
| 2022-04-12 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.85 | 0.90 |
| 2022-04-26 | G3 1 - RAW | 0 | 0 | na | Na |
| 2022-04-26 | G3 2 - TREATED | 0 | 0 | 1.05 | 1.10 |
| 2022-04-26 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.91 | 0.95 |
| 2022-05-10 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-05-10 | G3 2 - TREATED | 0 | 0 | 0.91 | 0.97 |
| 2022-05-10 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.88 | 0.96 |
| 2022-05-24 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-05-24 | G3 2 - TREATED | 0 | 0 | 0.97 | 1.09 |
| 2022-05-24 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.80 | 0.85 |
| 2022-06-07 | G3 1 - RAW | 0 | 0 | na | na |

Chlorine Residual and TC/EC Analyses (continued)

| Collection Date | Sample Identification | TC | EC | CL2 Free | CL2 Total |
|-----------------|------------------------------------|----|----|----------|-----------|
| 2022-06-07 | G3 2 - TREATED | 0 | 0 | 0.94 | 1.01 |
| 2022-06-07 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.85 | 0.89 |
| 2022-06-21 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-06-21 | G3 2 - TREATED | 0 | 0 | 0.89 | 0.92 |
| 2022-06-21 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.91 | 0.97 |
| 2022-07-05 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-07-05 | G3 2 - TREATED | 0 | 0 | 0.87 | 0.91 |
| 2022-07-05 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.86 | 0.89 |
| 2022-07-19 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-07-19 | G3 2 - TREATED | 0 | 0 | 0.83 | 0.89 |
| 2022-07-19 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.71 | 0.76 |
| 2022-08-02 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-08-02 | G3 2 - TREATED | 0 | 0 | 0.98 | 1.03 |
| 2022-08-02 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 1.03 | 1.08 |
| 2022-08-16 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-08-16 | G3 2 - TREATED | 0 | 0 | 0.92 | 0.99 |
| 2022-08-16 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.84 | 0.89 |
| 2022-08-30 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-08-30 | G3 2 - TREATED | 0 | 0 | 0.87 | 0.92 |
| 2022-08-30 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.88 | 0.93 |
| 2022-09-06 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-09-06 | G3 2 - TREATED | 0 | 0 | 0.92 | 0.98 |
| 2022-09-06 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.96 | 0.97 |
| 2022-09-20 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-09-20 | G3 2 - TREATED | 0 | 0 | 0.92 | 0.95 |
| 2022-09-20 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.90 | 0.91 |
| 2022-09-27 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-09-27 | G3 2 - TREATED | 0 | 0 | 0.93 | 0.98 |
| 2022-09-27 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.88 | 0.90 |
| 2022-10-11 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-10-11 | G3 2 - TREATED | 0 | 0 | 1.04 | 1.07 |
| 2022-10-11 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.81 | 0.87 |
| 2022-10-25 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-10-25 | G3 2 - TREATED | 0 | 0 | 0.92 | 0.97 |
| 2022-10-25 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.88 | 0.91 |

Chlorine Residual and TC/EC Analyses (continued)

| Collection Date | Sample Identification | TC | EC | CL2 Free | CL2 Total |
|-----------------|------------------------------------|----|----|----------|-----------|
| 2022-11-08 | G3 1 - RAW | 0 | 0 | na | na |
| 2022-11-08 | G3 2 - TREATED | 0 | 0 | 0.99 | 1.02 |
| 2022-11-08 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.86 | 0.89 |
| 2022-11-22 | G3 1 – RAW | 0 | 0 | na | na |
| 2022-11-22 | G3 2 – TREATED | 0 | 0 | 0.93 | 0.99 |
| 2022-11-22 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.83 | 0.91 |
| 2022-12-06 | G3 1 – RAW | 0 | 0 | na | na |
| 2022-12-06 | G3 2 – TREATED | 0 | 0 | 0.98 | 1.02 |
| 2022-12-06 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.86 | 0.91 |
| 2022-12-20 | G3 1 – RAW | 0 | 0 | na | na |
| 2022-12-20 | G3 2 – TREATED | 0 | 0 | 0.94 | 1.00 |
| 2022-12-20 | G3 3 - DISTRIBUTION Gilbert Plains | 0 | 0 | 0.95 | 0.97 |

Notes:

CL2: Reported in units of mg/L

TC/EC: Reported in units of MPN/100 mL

Water Chemistry



MWSB - G3 PWS
ATTN: IVAN YAKAMISHEN
G3 PWS
Box 642
Gilbert Plains MB ROL OXO

Date Received: 11-MAY-22
Report Date: 20-MAY-22 11:48 (MT)
Version: FINAL

Client Phone: 204-548-4561

Certificate of Analysis

Lab Work Order #: L2705132
Project P.O. #: NOT SUBMITTED
Job Reference: G3 PWS 71.25
C of C Numbers:
Legal Site Desc: 44602

Hua Wo
Chemistry Laboratory Manager

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Physical Tests (WATER)

| | | ALS ID | | L2705132-1 | L2705132-2 |
|----------------------------------|----------|----------------|----------------|--------------------|---------------------|
| | | Sampled Date | | 10-MAY-22 | 10-MAY-22 |
| | | Sampled Time | | 10:00 | 10:20 |
| | | Sample ID | | G3 1 - RAW | G3 2 - TREATED |
| Analyte | Unit | Guide Limit #1 | Guide Limit #2 | | |
| Colour, True | CU | 15 | - | <5.0 | <5.0 |
| Conductivity | umhos/cm | - | - | 993 | 223 |
| Hardness (as CaCO ₃) | mg/L | - | - | 557 ^{HTC} | 83.7 ^{HTC} |
| Langelier Index (4 C) | No Unit | - | - | 0.45 | -0.028 |
| Langelier Index (60 C) | No Unit | - | - | 1.2 | 0.74 |
| pH | pH units | 7.00-10.5 | - | 7.51 | 8.39 |
| Total Dissolved Solids | mg/L | 500 | - | 637 | 132 |
| Transmittance, UV (254 nm) | %T/cm | - | - | 90.8 | 98.2 |
| Turbidity | NTU | - | - | 0.11 | <0.10 |

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Anions and Nutrients (WATER)

| | | ALS ID | | L2705132-1 | L2705132-2 |
|---|------|----------------|----------------|------------|----------------|
| | | Sampled Date | | 10-MAY-22 | 10-MAY-22 |
| | | Sampled Time | | 10:00 | 10:20 |
| | | Sample ID | | G3 1 - RAW | G3 2 - TREATED |
| Analyte | Unit | Guide Limit #1 | Guide Limit #2 | | |
| Alkalinity, Total (as CaCO ₃) | mg/L | - | - | 379 | 79.1 |
| Ammonia, Total (as N) | mg/L | - | - | 0.87 | 0.016 |
| Bicarbonate (HCO ₃) | mg/L | - | - | 462 | 93.1 |
| Bromide (Br) | mg/L | - | - | 0.022 | <0.010 |
| Carbonate (CO ₃) | mg/L | - | - | <0.60 | 1.68 |
| Chloride (Cl) | mg/L | 250 | - | 4.95 | 3.60 |
| Fluoride (F) | mg/L | - | 1.5 | 0.254 | 0.044 |
| Hydroxide (OH) | mg/L | - | - | <0.34 | <0.34 |
| Nitrate (as N) | mg/L | - | 10 | <0.0050 | 0.0233 |
| Nitrite (as N) | mg/L | - | 1 | <0.0010 | <0.0010 |
| Sulfate (SO ₄) | mg/L | 500 | - | 201 | 31.7 |

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Organic / Inorganic Carbon (WATER)

| | | ALS ID | | L2705132-1 | L2705132-2 |
|--------------------------|------|----------------|----------------|------------|----------------|
| | | Sampled Date | | 10-MAY-22 | 10-MAY-22 |
| | | Sampled Time | | 10:00 | 10:20 |
| | | Sample ID | | G3 1 - RAW | G3 2 - TREATED |
| Analyte | Unit | Guide Limit #1 | Guide Limit #2 | | |
| Dissolved Organic Carbon | mg/L | - | - | 2.70 | 0.55 |
| Total Organic Carbon | mg/L | - | - | 2.86 | <0.50 |

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

 Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limit listed on this report.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.



ANALYTICAL REPORT

L2705132 CONTD....
PAGE 3 of 7
20-MAY-22 11:48 (MT)

Total Metals (WATER)

| Analyte | Unit | ALS ID | | L2705132-1 | L2705132-2 | L2705132-3 |
|-----------------------|------|----------------|----------------|---|---|---|
| | | Guide Limit #1 | Guide Limit #2 | Sampled Date Sampled Time Sample ID | Sampled Date Sampled Time Sample ID | Sampled Date Sampled Time Sample ID |
| | | | | 10-MAY-22 10:00 G3 1 - RAW | 10-MAY-22 10:20 G3 2 - TREATED | 10-MAY-22 10:50 G3 3 - DISTRIBUTION |
| Aluminum (Al)-Total | mg/L | 0.1 | 2.9 | 0.0038 | <0.0030 | 0.0081 |
| Antimony (Sb)-Total | mg/L | - | 0.006 | <0.00010 | <0.00010 | <0.00010 |
| Arsenic (As)-Total | mg/L | - | 0.01 | 0.0113 | 0.00260 | 0.00305 |
| Barium (Ba)-Total | mg/L | - | 2 | 0.0245 | 0.00233 | 0.00277 |
| Beryllium (Be)-Total | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 |
| Bismuth (Bi)-Total | mg/L | - | - | <0.000050 | <0.000050 | 0.000225 |
| Boron (B)-Total | mg/L | - | 5 | 0.175 | 0.129 | 0.131 |
| Cadmium (Cd)-Total | mg/L | - | 0.005 | <0.000050 | <0.000050 | <0.000050 |
| Calcium (Ca)-Total | mg/L | - | - | 135 | 20.0 | 20.2 |
| Cesium (Cs)-Total | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 |
| Chromium (Cr)-Total | mg/L | - | 0.05 | 0.00041 | <0.00010 | 0.00019 |
| Cobalt (Co)-Total | mg/L | - | - | 0.00023 | <0.00010 | <0.00010 |
| Copper (Cu)-Total | mg/L | 1 | 2 | 0.00158 | <0.00050 | 0.0130 |
| Iron (Fe)-Total | mg/L | 0.3 | - | 3.72 | 0.018 | 0.169 |
| Lead (Pb)-Total | mg/L | - | 0.005 | 0.000059 | <0.000050 | 0.000329 |
| Lithium (Li)-Total | mg/L | - | - | 0.0493 | 0.0101 | 0.0104 |
| Magnesium (Mg)-Total | mg/L | - | - | 53.2 | 8.20 | 8.47 |
| Manganese (Mn)-Total | mg/L | 0.02 | 0.12 | 0.175 | 0.00288 | 0.0164 |
| Molybdenum (Mo)-Total | mg/L | - | - | 0.00376 | 0.000465 | 0.000473 |
| Nickel (Ni)-Total | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 |
| Phosphorus (P)-Total | mg/L | - | - | 0.152 | <0.050 | 0.087 |
| Potassium (K)-Total | mg/L | - | - | 6.58 | 1.39 | 1.39 |
| Rubidium (Rb)-Total | mg/L | - | - | 0.00157 | 0.00034 | 0.00036 |
| Selenium (Se)-Total | mg/L | - | 0.05 | <0.000050 | <0.000050 | <0.000050 |
| Silicon (Si)-Total | mg/L | - | - | 13.8 | 2.32 | 2.34 |
| Silver (Ag)-Total | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 |
| Sodium (Na)-Total | mg/L | 200 | - | 36.5 | 16.7 | 17.1 |
| Strontium (Sr)-Total | mg/L | - | 7 | 0.501 | 0.0728 | 0.0736 |
| Sulfur (S)-Total | mg/L | - | - | - | - | 11.0 |
| Tellurium (Te)-Total | mg/L | - | - | <0.00020 | <0.00020 | <0.00020 |
| Thallium (Tl)-Total | mg/L | - | - | <0.000010 | <0.000010 | <0.000010 |
| Thorium (Th)-Total | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 |
| Tin (Sn)-Total | mg/L | - | - | <0.00010 | <0.00010 | 0.00115 |

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

- Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limit listed on this report.
- * Please refer to the Reference Information section for an explanation of any qualifiers noted.

Total Metals (WATER)

| | | ALS ID | | L2705132-1 | L2705132-2 | L2705132-3 |
|----------------------|------|----------------|----------------|------------|----------------|---------------------|
| | | Sampled Date | | 10-MAY-22 | 10-MAY-22 | 10-MAY-22 |
| | | Sampled Time | | 10:00 | 10:20 | 10:50 |
| | | Sample ID | | G3 1 - RAW | G3 2 - TREATED | G3 3 - DISTRIBUTION |
| Analyte | Unit | Guide Limit #1 | Guide Limit #2 | | | |
| Titanium (Ti)-Total | mg/L | - | - | 0.00035 | <0.00030 | 0.00060 |
| Tungsten (W)-Total | mg/L | - | - | <0.00010 | <0.00010 | <0.00010 |
| Uranium (U)-Total | mg/L | - | 0.02 | 0.000372 | 0.000051 | 0.000054 |
| Vanadium (V)-Total | mg/L | - | - | <0.00050 | <0.00050 | <0.00050 |
| Zinc (Zn)-Total | mg/L | 5 | - | 0.0294 | <0.0030 | 0.0041 |
| Zirconium (Zr)-Total | mg/L | - | - | <0.00020 | <0.00020 | <0.00020 |

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Volatile Organic Compounds (WATER)

| | | ALS ID | | L2705132-1 |
|---------------------------------------|------|----------------|----------------|------------|
| | | Sampled Date | | 10-MAY-22 |
| | | Sampled Time | | 10:00 |
| | | Sample ID | | G3 1 - RAW |
| Analyte | Unit | Guide Limit #1 | Guide Limit #2 | |
| Benzene | mg/L | - | 0.005 | <0.00050 |
| 1,1-dichloroethene | mg/L | - | 0.014 | <0.00050 |
| Dichloromethane | mg/L | - | 0.05 | <0.0050 |
| Ethylbenzene | mg/L | 0.0016 | 0.14 | <0.00050 |
| MTBE | mg/L | 0.015 | - | <0.00050 |
| Tetrachloroethene | mg/L | - | 0.01 | <0.00050 |
| Toluene | mg/L | 0.024 | 0.06 | <0.00050 |
| Trichloroethene | mg/L | - | 0.005 | <0.00050 |
| o-Xylene | mg/L | - | - | <0.00050 |
| m+p-Xylenes | mg/L | - | - | <0.00040 |
| Xylenes (Total) | mg/L | 0.02 | 0.09 | <0.00064 |
| Surrogate: 4-Bromofluorobenzene (SS) | % | - | - | 82.5 |
| Surrogate: 1,4-Difluorobenzene (SS) % | | - | - | 98.4 |

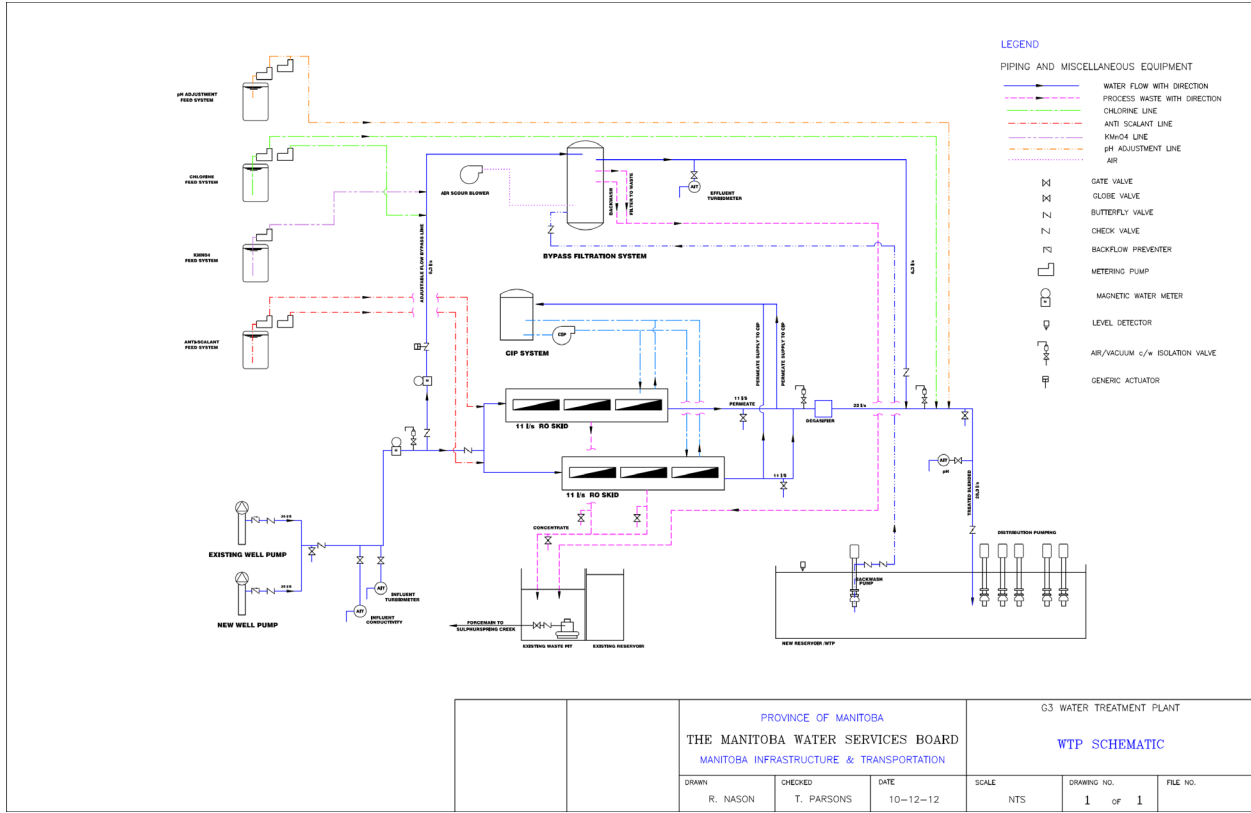
Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

 Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
 Analytical result for this parameter exceeds Guide Limit listed on this report.
 * Please refer to the Reference Information section for an explanation of any qualifiers noted.

Appendix B

Water Treatment Plant Process Diagram

Pipeline Schematic



| | | | | | |
|--|-----------------------|------------------|--|-----------------------|----------|
| PROVINCE OF MANITOBA THE MANITOBA WATER SERVICES BOARD MANITOBA INFRASTRUCTURE & TRANSPORTATION | | | G3 WATER TREATMENT PLANT WTP SCHEMATIC | | |
| DRAWN R. NASON | CHECKED T. PARSONS | DATE 10-12-12 | SCALE NTS | DRAWING NO. 1 of 1 | FILE NO. |