Manitoba
Sustainable Development
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba R3H 0W4

Roseau River IWMP Technical Input

The following report provided by the Office of Drinking Water is in response to a request for technical input by the Roseau River Integrated Watershed Management Plan project management team.

1) Can you provide information on past and present boil water advisories in the watershed and any other issues related to drinking water quantity or quality?

There are currently four active Boil Water Advisories in the Roseau River Watershed which pertain to three public water systems (PWS) and one semi-public water system (SPWS). Three of these systems are groundwater sourced and bacterial sampling from two systems indicates the presence of total coliform bacteria in the well water. The third groundwater sourced system has not submitted bacteriological samples therefore the safety of the water as a drinking water supply cannot be confirmed. One system is surface water sourced and bacterial sampling indicates the presence total coliform and *E.Coli* bacteria in the surface water supply. All four systems lack adequate disinfection treatment capable of 4-log (99.99%) reduction or inactivation of *Cryptosporidium* and *Giardia*. The surface water system also lacks adequate disinfection and filtration capable of 3-log (99.9%) reduction or inactivation of *Cryptosporidium* and *Giardia*.

Please note the above summary includes updated information from the previous Technical Submission. A Boil Water Advisory was issued to 3917.00 Ross L. Gray School - SPWS on June 30, 2016 due to the presence of total coliform bacteria in the water supply.

There were five historical Boil Water Advisories in the Roseau River Watershed which pertained to one PWS and three SPWS (one system was issued two advisories over three years). All four of these systems were groundwater sourced and bacterial sampling from three systems indicated the presence of total coliform bacteria in the well water. One system was issued an advisory for a treatment equipment malfunction. *E.Coli* bacteria were not a factor for the issuance of the advisories. All four systems lacked adequate disinfection treatment capable of 4-log (99.99%) reduction or inactivation of *Cryptosporidium* and *Giardia*.

2) Which public drinking water systems in the watershed have a history of poor source water quality thought to be a result of hazardous or non-complimentary land use activities in the near vicinity of the well-head or intake?

Chemistry data from four PWS and nine SPWS obtained through September 2010 to April 2016 were reviewed to determine source water quality in the watershed. Please note that the information reviewed was obtained from our electronic database only and is not exhaustive of all chemistry information acquired by the Office of Drinking Water. The samples were obtained at varying frequencies and locations. Consecutive samples were not compared to determine trends in concentration.

The analytical results reviewed only relate to chemistry parameters that must meet health based Maximum Acceptable Concentrations (MAC) per the *The Guidelines for Canadian Drinking Water Quality.* These parameters include the following: Antimony, Arsenic, Barium, Benzene, Boron, Bromate, Cadmium, Carbon Tetrachloride, Chromium, Dibromochloromethane, Dichloromethane, Ethyl Benzene, Fluoride, Lead, Manganese, Nitrate, Nitrate / Nitrite, Nitrite, Selenium, Tetrachloroethylene, Toluene, Trichloroethylene, Trihalomethanes, Uranium, and Xylene. The analytical results indicate that all water samples obtained from raw, treated, and/or distribution system sources did not exceed the MAC requirements.

Please note that results relating to aesthetic or operational considerations were not reviewed with exception to manganese, as a proposed MAC value is currently under consideration for *The Guidelines for Canadian Drinking Water Quality*. Manganese is a naturally-occurring element found in many groundwater or well water sources and in some surface waters. The analytical results indicate that manganese water samples obtained from raw, treated, and/or distribution system sources will not exceed the proposed MAC requirement with the exception to one sample. This sample was obtained from the treated water of a groundwater sourced PWS. A raw water sample was unable to be obtained from this system to confirm groundwater manganese concentrations.

3) What recommendations do you have for the Seine Rat River Watershed Conservation District and municipalities to protect drinking water quality?

Private wells – Well owners should be aware of the inherit risks associated with owning a well and the importance of routine maintenance, water quality testing, and installing water treatment. The Office of Drinking Water continues to develop educational material to assist homeowners in Manitoba with improving well water quality and drinking water safety. Having the information available to public through various distribution methods within the watershed (i.e., copies of fact sheets available in public offices/spaces and posting and linking to information online) will help achieve this.

Continuing programs such as the conservation district well inventory and bacteria sampling, and providing funding to homeowners as an incentive to seal abandoned wells or upgrade well pits will help to identify and eliminate pathways of contamination, improve water quality, and provides an excellent outreach opportunity.

4) Who can local residents contact if they want to have their well water tested or have questions about the safety of their drinking water?

Residents may contact Manitoba Office of Drinking Water's Private Well, Education and Outreach Coordinator. The outreach coordinator can provide advice and recommendations to private well owners with respect to well maintenance, water quality testing, treatment options, and troubleshooting well water concerns.

Private well owners are also encouraged to visit the Office of Drinking Water website at www.manitoba.ca/drinkingwater where a number of drinking water fact sheets dedicated to well owners are available.

5) What should local residents do to properly maintain their private well and protect their drinking water quality?

Well Maintenance – It's important to continue to maintain a well to ensure drinking water safety. Well contamination is typically the result of a pathway developing at the well head. Some of the common maintenance fixes to eliminate well contamination include - have a properly fitted well cap, casing stickup 1 to 1 ½ feet above ground, surface water drainage away from the well, inspect for cracks or seepage of casing or pitless unit, upgrade well pits, seal abandoned wells.

Well water quality testing – Routine water quality testing of the well water should be conducted to ensure drinking water safety. This includes testing for the following:

- Bacteria (total coliforms and *E. coli*) – test at least once a year. The best time to collect a sample is following a period of significant surface water runoff, such as following the spring snow melt or a strong rain storm event. A test for bacteria should also be done if there is a change in water quality (smell, taste, colour, or clarity), and following any well maintenance.
- Nitrate – test for nitrate every three to five years or if there is an infant, pregnant woman, or woman planning a pregnancy in the home.
- Trace elements (arsenic, barium, boron, fluoride, uranium) – Collect a sample if unknown. If no trace elements with potential health effects are detected, sample again in 8-10 years. If detected but below Health Canada's Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentration (MAC) sample in 3-5 years. If any are above the MAC, consider how the water is being used. If this is the primary source of drinking water, install treatment to reduce concentrations, or use an alternate safe source of drinking water such as bottled water or connecting to a municipal water system if available.
- Common minerals – testing for common minerals including but not limited to calcium, magnesium, hardness, iron, manganese, chloride, and sulphate, will help to identify common aesthetic problems such as scale build-up and staining of plumbing fixtures and laundry. A common minerals test should be done on all wells, new well construction, and prior to any water treatment install.

Install Water Treatment – Homeowners are advised to install certified water treatment systems when water quality results indicate parameters exceeding maximum acceptable concentrations, or aesthetic objectives under Health Canada's Guidelines for Canadian Drinking Water Quality.

Drinking water treatment devices can be installed at the tap (point-of-use) or where the water enters the house (point-of-entry). Any treatment device should be certified to meet the NSF international (NSF)/American National Standards Institute (ANSI) standard for removal of the specific contaminant of concern.

Organizations that are accredited to certify devices to the NSF standard (including NSF itself) are listed below. Homeowners can visit the websites for listings of certified products.

- NSF International (NSF) www.nsf.org
- Canadian Standards Association (CSA) – www.csagroup.org
- Underwriters Laboratories Incorporated (UL) – www.ul.com
- International Association of Plumbing and Mechanical Officials (IAPMO) – www.iapmo.org
- Water Quality Association (WQA) – www.wqa.org

Certified devices are tested to ensure the safety of materials used in the devices and to ensure they perform as claimed.

Homeowners should obtain quotes from reputable water treatment equipment suppliers. Suppliers should provide information on how much of the contaminant can be expected to be removed, maintenance requirements and costs.

Once installed, homeowners should follow the manufacturer's instructions on the use and maintenance of treatment devices and disposal of filter media.

6) Are there any concerns related gravel pit or peat mining operations on drinking water quality? If yes, where and what should be done to address these concerns?

The Office of Drinking Water is not aware of any concerns related to gravel pit or peat mining operations on drinking water quality.

Add any other drinking water studies or information you have relevant to this watershed.

Manitoba's trace elements in groundwater maps (located at http://www.gov.mb.ca/conservation/waterstewardship/odw/public-info/fact_sheets/index.html indicate concentrations of arsenic, barium, fluoride, and uranium have been detected, and in some samples, above maximum acceptable concentrations throughout the Roseau River Watershed area.

The following information has been updated since the previous Technical Submission by the Office of Drinking Water:

- 4057.00 Sunset Oaks Family RV Park SPWS is now operating as a PWS (223.60)
- A groundwater sourced SPWS was recently discovered in the Roseau River Watershed. It is now operating as 1431.50 Borderview Christian Day School – SPWS.

Roseau River IWMP

Office of Drinking Water

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Dominion City Community Hall

September 22, 2016

Amanda Crawley, Senior Drinking Water Officer

Manitoba

Outline

- The role of The Office of Drinking Water
- Types of Water Systems
- Public Water System Summary
- Semi-Public Water System Summary
- Historical Boil Water Advisories
- Technical Input
- Recommendations

The Office of Drinking Water

- *The Drinking Water Safety Act &* Drinking Water Safety Regulation and Drinking Water Quality Standards Regulation
- Regulations, licences, permits, advisories and orders
- Public health protection
- Promote involvement from outside agencies
- Documentation of results

PWS & SPWS

- **"public water system"** means a water system that
- (a) has 15 or more service connections, or
- (b) has fewer than 15 service connections, but is designated under clause 2(b) as a public water system;

- **"semi-public water system"** means a water system that is not a public water system or a private water system
  - currently regulating 5-14 service connections
  - hospitals, personal care homes, child care facilities or home day cares, schools, restaurants, food handling establishments, children’s or recreational camp

Public Water System Summary

- Twelve Public Water Systems (PWS) in the Roseau River Watershed
- Four PWS obtain water from outside of watershed
- Remaining eight PWS were reviewed for the technical submission

- Includes large regional systems, water co-ops, communities, colonies, trailer parks and campgrounds.
- Population ranges from 40 to 24,000
- Source water types
  - Two surface water systems
  - Five groundwater systems
  - One groundwater (potentially GUDI) system

- Three active PWS Boil Water Advisories
  - Surface water - *E.coli* and total coliform bacteria
  - Groundwater system - coliform bacteria
  - Potentially GUDI system water quality unknown.
  - Inadequate treatment for all three

Semi-Public Water System Summary

- Twelve Semi-Public Water Systems (SPWS) in the Roseau River Watershed
- Includes colonies, retirement communities, schools, a bible camp, daycare, hospital, and a personal care home.
- Population ranges from 33 to 420
- All groundwater sourced systems

- Two active SPWS Boil Water Advisories
  - Both are groundwater sourced
  - Both have total coliform bacteria present
  - One system has no treatment in place
  - One system has inadequate treatment

Historical Boil Water Advisories

- Five historical advisories in the Roseau River Watershed
  - All were groundwater sourced where total coliform bacteria was present
  - All had inadequate treatment in place
  - One issued for treatment malfunction
  - No *E.coli* present

Technical Input

- Initial technical submission included:
  - Water system GPS information
  - Water system contact information
  - Treatment information

The Office of Drinking Water also facilitated meetings with IWMP team members

Recommendations

- Increase awareness for private well owners
  - Well Maintenance
  - Water Quality Testing
  - Water Treatment

- Well Maintenance
  - Eliminate pathways for contamination
    - Ensure proper well construction
    - Invest in upgrades
    - Seal abandoned wells

- Water Quality Testing
  - Bacteria (Total Coliforms and *E. Coli*)
  - Nitrates
  - Trace Elements
  - Common Minerals

- Water Treatment
  - Meets NSF/ANSI standards
  - Explore types of treatment
  - Research suppliers and obtain quotes
  - Supplier to provide relevant information

- Public access to Office of Drinking Water Fact Sheets
- Continuation of well inventory and bacteria sampling initiatives
- Continuation of funding incentives for sealing abandoned wells or upgrades