

**Bray Well Municipal Water  
Supply System Expansion  
Environment Act Proposal**

Final Report



Prepared for:  
Rural Municipality of East St. Paul  
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**Stantec Project No. 111214610**

September 27, 2013



## Sign-off Sheet

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**BRAY WELL MUNICIPAL WATER SUPPLY SYSTEM EXPANSION  
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# BRAY WELL MUNICIPAL WATER SUPPLY SYSTEM EXPANSION ENVIRONMENT ACT PROPOSAL

## Executive Summary

The Rural Municipality (RM) of East St. Paul retained Stantec Consulting Ltd. (Stantec) to prepare an Environment Act Proposal for a Class 2 Development Licence under *The Environment Act* for a municipal water supply system expansion. This Environment Act Proposal is submitted for the Bray Well Municipal Water Supply System Expansion located at the intersection of Provincial Road 202 and Bray Road West.

The current municipal water-supply-system and licensing permits the withdrawal of 994.24 acre-feet/year (1,226.39 dam<sup>3</sup>/year) and does not provide for additional capacity. Stantec (2004) believes this to be insufficient to handle the anticipated future growth of up to 100 new residences annually.

There are approximately 910 Equivalent Residential Units (ERUs) connected to the municipal water supply with a further 860 new ERUs anticipated to be connected through the subdivision applications that are already approved or are in the planning process. The projected 20-year population is approximately 2500 ERUs; Stantec predicts that an additional 567.5 acre-feet/year (700 dam<sup>3</sup>/year) is needed to satisfy future demand for residential expansion within the RM.

The proposed development includes the raw-water supply pipeline (250-300 mm) would run from the Bray Well and terminate at the existing Water Treatment Plant at Wenzel Road and Provincial Trunk Highway (PTH) 59. The well has a diameter of approximately 25 cm and consists of a 36.5 m steel-cased open hole.

Potential adverse effects of construction and operation include the disturbance of vegetation and wildlife, contamination of the aquifer and a reduction of aquifer quantity. Stantec's assessment of the proposed Bray Well Municipal Water Supply System Expansion indicates that the potential environmental effects would be of low significance due to the following factors:

- The RM is located near a major recharge area in the Birds Hill Glacio-Fluvial Complex, water levels are generally constant and there has been little fluctuation over the past 50 years.
- The proposed municipal water-supply-system expansion will be located in a previously disturbed agricultural area.

The application of appropriate mitigation measures during construction will avoid the sensitive breeding season, equipment will be properly maintained and hazardous wastes will be securely stored.





## 1.0 Introduction

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The Rural Municipality (RM) of East St. Paul proposes to expand its existing municipal groundwater-supply-system by developing the Bray Road Municipal Supply Well (“the Project”), located at Provincial Road (PR) 202 and Bray Road West (Figure 1-1). An original test well (ID: TW03-04) was constructed at this location by Friesen Drillers Limited (Friesen Drillers) in December 2004, under the supervision of Stantec Consulting Ltd (Stantec).

This document provides the information required by Manitoba Conservation and Water Stewardship’s (MCWS’s) *Environment Act Proposal Report Guidelines*, as well as additional information required by *Supplementary Guidelines for Municipal Water Supply Systems*.

Stantec submits this environmental assessment to MCWS for a municipal water-supply well expansion on behalf of the owner, the RM of East St. Paul. This application is being prepared pursuant to section 11 of *The Environment Act* notwithstanding that system expansions can be accommodated pursuant to section 14 of the *Act*.

### 1.1 THE PROPONENT

For the purposes of development licensing, the proponent of the Project is the RM of East St. Paul (hereafter “the Proponent”).

For further information regarding the RM of East St. Paul, please contact the following:

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**1.2 BACKGROUND****1.2.1 Existing Well Fields**

In the early 1990s, the RM developed a well field in the overburden gravels on the east side of the Red River Floodway. A water-supply pipeline and additional wells were also developed in the area. The purpose of the water supply was to attempt capture of seepage losses that were occurring to the Red River Floodway from the Birds Hill Glacio-Fluvial deposit (Friesen Drillers 2012).

A new well field was later developed at Wenzel Road and Provincial Trunk Highway (PTH) 59. This location subsequently became the site of the RM's Water Treatment Plant. This supply well was installed in 2004 and was licensed shortly afterwards. In 2009, an Environment Act Licence was applied for through Manitoba Environment (now MCWS) for the RM water supply.

Aware of the need to meet future water-supply demands, the RM undertook test drilling in 2004. Of the locations surveyed, Stantec deemed the Bray Road test well to be the most suitable source for future water supply (Friesen Drillers 2012). This Project involves the conversion of the Bray Well test well into a municipal supply well.

**1.2.2 Existing Approvals**

There are numerous existing approvals related to the RM's municipal water supply. This section provides a brief summary of relevant active licenses.

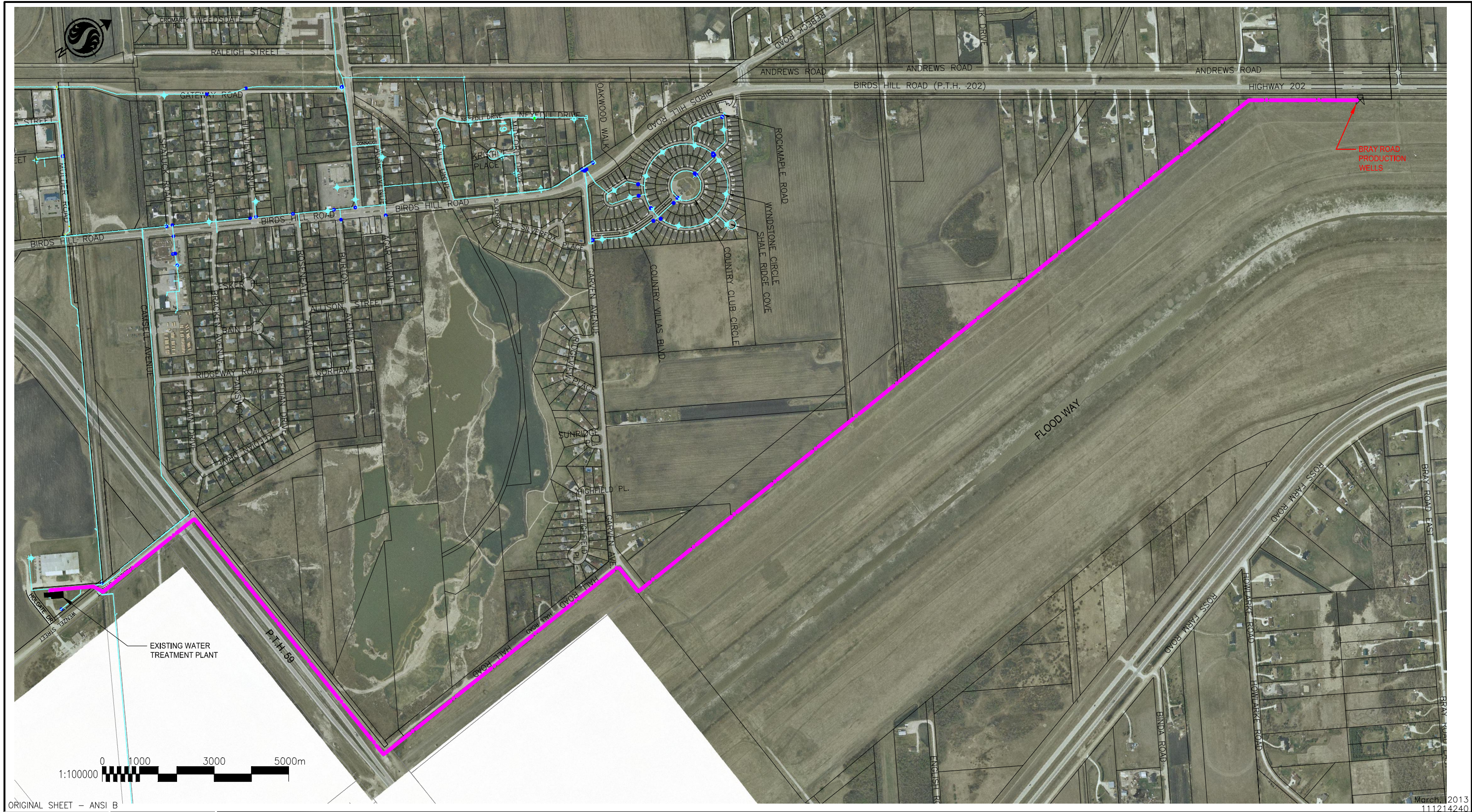
There are three existing Water Rights Licenses in place for the RM (see Attachment A -Appendix A):

- 1) Water Rights Licence No. 2005-060: Oasis Road Carbonate Aquifer Water supply well, grants the withdrawal of 158.09 acre-feet/year.
- 2) Water Rights Licence No. 2007-074: Oasis Road sand and gravel supply wells (three), grants the withdrawal of 290.0 acre-feet/year.
- 3) Water Rights Licence No. 2009-030: Wenzel Road Carbonate Aquifer supply well, grants the withdrawal of 496.15 acre-feet/year.

Environment-Act Licence No. 2876 was granted to the RM on April 6, 2009 for the operation of a groundwater supply system for municipal purposes.

On July 5, 2011, Friesen Drillers submitted a groundwater exploration application for a municipal water supply located at the junction of PR 202 and Bray Road. MCWS granted the permit on August 9, 2011 and included a diversion allocation for 700 dam<sup>3</sup>/year (567.5 acre-feet/year; see Attachment A - Appendix C).

As the Project proposes the withdrawal of 700 dam<sup>3</sup> annually, it is considered a "Class 2 Development" pursuant to S.11 of *The Environment Act (1987)* and thereby requires an Environment Act Licence prior to operation.



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**Legend**

- PROPOSED RAW WATER LINE ROUTE (CONCEPT No. 1 / 2)
- WELL

Client/Project  
 R.M. OF EAST ST. PAUL  
 WATER TREATMENT MASTER PLAN

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Figure No.  
**1-1**

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Title  
**PROPOSED PIPING ROUTE**



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### 1.2.3 Previous Studies/Reports/Plans

Previous studies/reports related to the East St. Paul municipal water-supply-system include, but are not necessarily limited to, the following:

- Stantec. 2004. Water Supply Assessment East St. Paul, Manitoba.
- Stantec.2005. East St. Paul Groundwater Investigations; Technical Memorandum 1-4.
- Stantec 2005. Construction and Testing of Production Well PW8 East St. Paul, Manitoba.
- Stantec. 2012. East St. Paul WTP Master Plan – Water Supply Requirements Memo November 16.
- Friesen Drillers Ltd. 2012. Municipal Groundwater Supply Expansion Investigation River Lot 70 – Parish of St. Paul.
- East St. Paul Emergency Protection Plan for Groundwater Supplies.

Current information regarding the existing and proposed municipal well infrastructure is consolidated in Friesen Drillers (2012) which has been provided in its entirety as Attachment A. As determined in conjunction with regulators, the contents of this report are cross-referenced, where applicable, herein.

### 1.2.4 Project Need and Purpose

Previous Stantec (2004) projections estimated that up to 100 new residential dwellings could be constructed in the RM from 2004 annually. Existing water-supply infrastructure and licensing (994 acre-feet/year or 1,226 dam<sup>3</sup>/year) does not provide additional capacity for expanding residential development. Stantec predicts an additional 567.5 acre-feet/year (700 dam<sup>3</sup>/year) of water is required to satisfy future water supply demands for residential expansion within the RM. A summary of the projected 20-year water demand is provided by Stantec (see Attachment A - Appendix D).

The Project is needed to facilitate anticipated residential expansion. The Project purpose is to provide water requirements for the projected 20-year water demand, including planned residential expansion.

## 1.3 PROJECT ALTERNATIVES

The site was selected in 2004 as part of a joint testing program conducting by Stantec and Friesen Drillers. The well site is located in a highly transmissive area of the carbonate bedrock aquifer and is thought to be an appropriate source of municipal water supply (Friesen Drillers 2012). Because of the known quality of the aquifer water, the precedents for water-supply-systems using the aquifer, and absence of alternative sources of similar quality water, no alternative water sources were evaluated for this expansion.

Water-supply sources for future expansion beyond the current 20-year planning horizon are anticipated to be based on an integrated water supply and watershed planning study to be commissioned by the RM.

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Such a study would address issues such as prospective water supply sources, allocations and other water supply alternatives.

## 2.0 Project Description

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### 2.1 PROJECT LOCATION

The Project is located at the intersection of PR 202 and Bray Road West within the RM of East St. Paul. Coordinates of the Bray Well Site are as follows: legal land location: PA-OT-69, UTM: Zone 14N: E-644354, N-5540197. The proposed raw water supply pipeline would run from the Bray Well in a southwesterly direction and terminate at the existing water treatment plant (Figure 1-1).

The supply well is located within a Manitoba Infrastructure and Transportation (MIT) right-of-way. Site access is provided under the legal agreement that exists between the RM and MIT (see Attachment A - Appendix B).

### 2.2 WELL DETAIL

This Project concerns the conversion of the existing Bray Well test well into a supply well; in order to achieve this, electrical service will be brought to the site and a submersible pump and drop pipe installed. The approximately 25 cm diameter supply well consists of a 36.5 m steel-cased open hole. Friesen Drillers (2012) noted the well to be of a very high capacity. Complete geological and borehole construction logs, dated December 19, 2011, are attached (see Attachment A - Appendix H).

### 2.3 PIPELINE DETAIL

The proposed raw-water pipeline would be 250-300 mm in diameter and would be installed with 2.4 m of cover. The pipeline will be installed using directional drilling and open-cut excavation, where appropriate.

### 2.4 SYSTEM USE

#### 2.4.1 Water Use

Historical water consumption patterns in the RM of East St. Paul for the last ten years are shown in Table 2-1 below. The total number of Equivalent Residential Units (ERUs) includes all residential, commercial, institutional and industrial consumers. It should also be noted that a substantial number of residences in the RM draw water from the same aquifer using private wells.

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**Table 2-1: 10-Year Historical Water Consumption in the RM of East St. Paul, 2003-2012**

<b>Year</b>	<b>ERUs</b>	<b>New ERUs</b>	<b>Average Day (m<sup>3</sup>)</b>	<b>Daily per Capita L</b>	<b>Maximum Day (m<sup>3</sup>)</b>	<b>Peaking Factor</b>
2003	608	-	563	290	2519	4.5
2004	705	97	530	235	1744	3.3
2005	770	65	579	235	1491	2.6
2006	802	32	882	344	2526	2.9
2007	818	16	654	250	2246	3.4
2008	833	25	664	249	1708	2.6
2009	859	26	647	235	1757	2.7
2010	878	19	665	237	1613	2.4
2011	902	24	856	297	2690	3.1
2012	910	8	838	288	2563	3.1
*10-year average = 266 litres per capita per day *5-year average = 261 litres per capita per day Source: Stantec. 2012. East St. Paul WTP Master Plan – Water Supply Requirements Memo November 16.						

As of 2012, approximately 910 existing ERUs are connected to the municipal water supply system, with approximately 860 new ERUs anticipated to be connected through subdivision applications that either are approved or are in the planning process (Stantec 2012). With new ERUs expected to be added at an average annual rate of 80 ERUs per year, the projected 20-year population is estimated to be approximately 2500 ERUs. The projected water demands for the 20-year population of 2500 ERUs are as follows:

- Average daily demand = 25 L/s
- Average Annual Withdrawal Rate = 788,400 m<sup>3</sup>
- Maximum Withdrawal Rate = 75 L/s



## **3.0 Water Conservation Measures**

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### **3.1 BY-LAWS**

The following RM of East St. Paul by-laws concern the control and conservation of water for those on the municipal system:

- The *Sprinkling of Water By-Law No. 2002-31* (Attachment B) regulates the application or distribution of water on lawns or boulevards by sprinkling or spraying.
- The *Water Utility By-Law No. 2009-18* (Attachment C) provides for the establishment of regulations related to water treatment and distribution.

### **3.2 CURRENT CONSERVATION MEASURES**

Depending on the stage of restriction in force, the *Sprinkling of Water By-Law* limits the times of day, days of the week and civic addresses (alternating between odd and even numbered homes) that are able to sprinkle water between the last Saturday of May and September 30.

However, these restrictions do not apply to the following class of water users, which rely upon the steady supply, and use of water:

- a. Licensed nurseries.
- b. Licensed golf courses and driving ranges.
- c. Playing fields and public gardens owned by the Municipality.
- d. For dust control, if safety or sanitary concerns exist or for compaction during construction if no reasonable alternative exists.

The Water Utility By-Law establishes requirements for water metering. Section 47(b) (i) prohibits willful or malicious “discharge of any water so that it runs waste or useless out of the Municipal Water Utility System.”

### **3.3 PUBLIC AWARENESS AND PUBLIC INVOLVEMENT**

Residents within a 1250-metre radius of the well site were notified of the proposed development by mail (Attachment D). The RM also provides details of their municipal water supply on their website.



## 4.0 Existing Environment

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Friesen Drillers Ltd. (Attachment A) has previously described the existing environment in the RM of East St. Paul relative to the Bray Road Well. This report is referenced herein, where appropriate.

### 4.1 SITE SETTING

See **Site Setting** (Attachment A).

### 4.2 PHYSICAL CLIMATE

Climate within the Winnipeg Ecodistrict is consistent with that throughout the Lake Manitoba Plain Ecoregion and is characterized by relatively short, warm summers and long cold winters (Smith *et al.* 1998). The mean annual temperature varies from 1.8°C to 3.1°C; the average growing season is 177 days.

The mean annual precipitation is approximately 500 mm in the Ecodistrict of which approximately one-quarter falls as snow. The maximum-recorded daily precipitation was 100.3 mm, which fell on June 18, 1956. Precipitation varies greatly from year to year and is highest from late spring through summer. The average yearly moisture deficit is about 160 mm (Smith *et al.* 1998).

Table 4-1 provides climatic normals for Winnipeg Richardson Airport, approximately 31 km southwest of the Project site.

**Table 4-1: Climate Normals for Winnipeg Richardson Airport (1971-2000)**

Parameter	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Average Temp. °C	-17.3	-13.4	-6.1	4	12	17	19.5	18.5	12.3	5.3	-5.3	-14.4
Daily Max. °C	-12.7	-8.5	-1.1	10.3	19.2	23.3	25.8	25	18.6	10.8	-0.9	-9.7
Daily Min. °C	-22.8	-18.7	-11	-2.4	4.8	10.7	13.3	11.9	6	-0.3	-9.6	-19.1
Rainfall (mm)	0.2	2.5	7.5	21.5	58	89.5	70.6	75.1	51.9	31	6.1	1.6
Snowfall (cm)	23.1	14.2	15.8	10.1	0.8	0	0	0	0.4	5	21.4	19.8
Precipitation (mm)	19.7	14.9	21.5	31.9	58	89.5	70.6	75.1	52.3	36	25	18.5

Source: Environment Canada, National Data and Information Archive. 2013. Station: Winnipeg Richardson Airport. Accessed June 2013. URL: [http://www.climate.weatheroffice.gc.ca/climate\\_normals/results\\_e.html?stnID=3698&lang=e&dCode=1&province=MAN&provBut=Search&month1=0&month2=12](http://www.climate.weatheroffice.gc.ca/climate_normals/results_e.html?stnID=3698&lang=e&dCode=1&province=MAN&provBut=Search&month1=0&month2=12)

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**4.3 BEDROCK GEOLOGY**

See **Bedrock Geology** (Attachment A).

**4.4 SURFICIAL GEOLOGY**

See **Surficial Geology** (Attachment A).

**4.5 HYDROGEOLOGY**

See **Hydrogeology** (Attachment A).

**4.6 LOCAL HYDROGRAPH REVIEW**

See **Local Hydrograph Review** (Attachment A).

**4.7 VEGETATION AND WILDLIFE**

The Project is located in the Winnipeg Ecodistrict within the Lake Manitoba Plain Ecoregion where native vegetation generally consists of tall prairie grass, meadow prairie grass and meadow grass communities. Adjacent to the Red River Floodway, natural vegetation near the Project has largely disappeared due to agriculture and other anthropogenic activities. Trees grow naturally, though only as a fringe along stream channels; on the better-drained sites, bur oak and trembling aspen with an undergrowth of snowberry, hazelnut and red osier dogwood commonly occur. On the alluvial floodplain deposits and lower river terraces, white elm, basswood, cottonwood, Manitoba maple and green ash with an undergrowth of willow, ferns and associated herbaceous plants are found (Smith *et al.* 1998).

The region includes habitat for white-tailed deer, coyote, rabbit, ground squirrel and waterfowl (Smith *et al.* 1998).

A search of Manitoba Conservation Data Centre's rare species database revealed no recorded occurrences of rare flora and fauna near the Project site (Friesen *pers. comm.* 2013).

**4.8 SOCIO-ECONOMIC ENVIRONMENT**

Nearby RMs include Springfield, St. Clements, West St. Paul and St. Andrews. The City of Winnipeg lies to the immediate south, while the unincorporated community of Lockport is approximately 18 km to the north and the City of Selkirk approximately 27 km to the north. The 2011 and 2006 Census Data (Statistics Canada 2012; Statistics Canada 2006) have been released for selected criteria and were used to draft this section.

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**4.8.1 Population and Demographics**

The current (2011) population of East St. Paul is 9,046 people, a 3.6% increase from 2006 at 8,733 individuals. There was also a 5.1 % increase in the number of households from 2,905 in 2006 to 3,055 in 2011 (Table 4-2).

**Table 4-2: Population Characteristics for the RM of East St. Paul, Manitoba (2006 and 2011)**

<b>Population</b>	<b>RM of East St. Paul</b>
Population in 2011	9,046
Population in 2006	8,733
2006 to 2011 population change (%)	3.6
Population Density per square kilometer	214.9
Number of households in 2011	3,055
Number of households in 2006	2,905
Source: Statistics Canada, 2012	

The 2011 Statistics Canada population breakdown by percentage groups in the RM of East St. Paul is shown in Table 4-3 below. The median age of the population increased from 42 years in 2006 to 43.7 years in 2011, whereas, in Manitoba the median age of the population was lower, remaining constant at 38 years from 2006 to 2011. The percent of population over the age of 15 in the RM was higher in 2011 (82.6%) than Manitoba overall (80.9%).

Closer examination of the population demographics in 2011 indicates that the population in the RM of East St. Paul is marginally older compared to Manitoba overall, with 28.1% of the population in the RM over the age of 55, compared to Manitoba at 26.6%.

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**Table 4-3: Population Demographics for the RM of East St. Paul, Manitoba (2006 and 2011)**

	RM of East St. Paul (2011)		RM of East St. Paul (2006)		Province of Manitoba (2011)	Province of Manitoba (2006)
	Total Population	%	Total Population	%	%	%
Total Population	9045	100	8735	100	100% (1,208,268)	100% (1,148,400)
0 to 4 years	360	4	365	4.2	6.4	5.9
5 to 9 years	540	6	555	6.4	6.2	6.4
10 to 14 years	680	7.5	755	8.6	6.6	7.2
15 to 19 years	785	8.7	775	8.9	7.1	7.3
20 to 24 years	630	7	545	6.2	6.9	6.8
25 to 29 years	295	3.3	250	2.9	6.5	6.1
30 to 34 years	285	3.2	310	3.5	6.2	6.2
35 to 39 years	456	5	515	5.9	6.3	6.4
40 to 44 years	665	7.4	775	8.9	6.4	7.7
45 to 49 years	820	9.1	960	11	7.5	7.8
50 to 54 years	975	10.8	820	9.4	7.4	7.1
55 to 59 years	785	8.7	670	7.7	6.6	6.2
60 to 64 years	610	6.7	530	6.1	5.7	4.7
65 to 69 years	485	5.4	370	4.2	4.2	3.7
70 to 74 years	320	3.5	240	2.7	3.2	3.2
75 to 79 years	170	1.9	165	1.9	2.6	2.8
80 to 84 years	100	1.1	80	0.9	2.1	2.3
85 years +	60	0.7	50	0.6	2.2	2.1
Median Age of Population	43.7		42		38.4	38.1
% of Population Aged 15+	82.6		80.8		80.9	80.4
Source: Statistics Canada 2012 and 2007						

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**4.8.2 Aboriginal Communities**

In addition to a portion of land adjacent to the Water Treatment Plant (Attachment E), the Brokenhead Ojibway Nation own the currently undeveloped Na-Sha-Ke-Penais Reserve located on McGregor Farm Road approximately 1 km southwest of the RM of East St. Paul Water Treatment Plant.

**4.8.3 Heritage Resources**

The Project is located in previously disturbed agricultural lands adjacent to the Red River Floodway. Archaeological sites relating to First Nation land use prior to ca. A.D. 1700, if present, would relate to small encampments of a few individuals who required temporary shelter while on hunting or gathering activities. Archaeological sites relating to homestead settlement activities would consist of former trails that connected this area with the main trail parallel to the Red River, present-day Henderson Highway, or by temporary shelters used by landowners as they cleared standing vegetation for agricultural use within the Outer Two Mile sections of their land holdings.

**4.8.4 Infrastructure**

The proposed raw water pipeline, connecting the Bray Well to the Water Treatment Plant, will intersect the path of a Central Manitoba Railway Incorporated (CMR) railroad line (Attachment F).





## 5.0 Environmental Effects Assessment

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### 5.1 ENVIRONMENTAL ASSESSMENT APPROACH

Predicted environmental effects of the Project are documented in the following sections. In accordance with regulatory requirements, conclusions are made regarding whether any potential environmental change is “significant.”

The Significance Determination Methods provided in Attachment G were used to determine the significance of potential residual impacts.

### 5.2 CONSTRUCTION

As previously indicated, it is proposed that the existing Bray Well test well be converted into a supply well. Accordingly, this section does not address well installation. It only addresses well commissioning and the installation of the raw-water pipeline.

#### 5.2.1 Vegetation and Wildlife

Though construction will take place in previously disturbed agricultural land, there is some potential for loss of a limited amount of vegetation because of directional drilling, open-cut excavation and the movement of equipment.

Mitigation measures to areas disturbed because of construction include:

- Limiting the surface disturbance to the extent feasible.
- Revegetation of disturbed areas following construction, where appropriate.

**The potential construction-related effects of the project on vegetation are anticipated to be reversible, low in magnitude and short term. With the implementation of the mitigation measures, no significant adverse effects on vegetation are anticipated because of Project construction.**

Potential adverse effects on wildlife and habitat during construction are related to noise and human activity disturbance. There is potential for construction activity and the use of machinery to cause wildlife (e.g. songbirds, small mammals/rodents) to temporarily avoid the Project site during construction.

To mitigate such effects, no open excavation or boring will occur during the bird-nesting season (April 1-July 31). In compliance with the *Migratory Birds Convention Act*, construction activities will not disturb, move or destroy migratory bird nests. If a nest is encountered, work will temporarily pause in the immediate area. As many species of wildlife breed and raise young within similar timing windows, mitigative activities aimed at avoiding effects to avian species are also expected to ameliorate potential

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impacts to small and larger mammals that may be breeding in the Project site. There are no recorded observations of rare or endangered species near the Project site (Friesen *pers. comm.* 2013). However, all Project staff will be ware of their responsibilities to watch for and avoid wildlife activity in the area.

**By avoiding the sensitive breeding period, it is anticipated that potential adverse construction-related effects to wildlife will be low in magnitude and short-term. With the implementation of the mitigation measures, no significant adverse effects on wildlife are anticipated because of Project construction.**

### 5.2.2 Aquifer Quality

There is potential for aquifer contamination during pipeline installation. Fuel leaks or spills will be mitigated by using properly maintained equipment, spill clean-up equipment will be available on-site and hazardous materials will be securely stored in approved containers in designated lay down areas. In the event of a spill, MCWS will be notified through the emergency response line and appropriate action will be taken according to MCWS requirements. Furthermore, there will also be no interconnection of private water supply systems with the Project.

**Potential effects to aquifer quality during construction will be restricted to the Project site and be of moderate-high magnitude. Following implementation of mitigation measures, the potential effects on aquifer quality are considered negligible and therefore not significant.**

### 5.2.3 Socioeconomic Effects

Potential adverse effects on the socioeconomic environment during construction relate primarily to issues of public safety for workers and the public during construction. It is anticipated that these potential effects can be fully mitigated to acceptable levels through personnel training and adherence to applicable guidelines and regulations.

**The socio-economic effects of Project construction are anticipated to adverse, sporadic (lasting only as long as construction is underway), local, reversible, short-term and of minor magnitude and therefore not significant.**

#### 5.2.3.1 Aboriginal Communities

The Project does not traverse either the land owned by the Brokenhead Ojibway Nation adjacent to the Water Treatment Plant, nor the undeveloped Na-Sha-Ke-Penais Reserve; no effects are anticipated on the reserve or First Nation's people.

#### 5.2.3.2 Heritage Resources

To date, no heritage resources have been recorded in the project area. The potential for such resources is low given the paucity of cultural land use during the period prior to A.D. 1900.

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However, during the course of construction, workers will be alert for artifacts that may be uncovered and, in the event that artifacts of potential significance are unearthed, work will cease until Historic Resources Branch Authorities have been notified.

**The effects on heritage resources are expected to be negligible, limited to the vicinity of the Project site and therefore not significant.**

#### 5.2.3.3 Infrastructure

Crossing the existing CMR railroad with the raw-water-supply pipeline has the potential to disturb CMR infrastructure or operations. To reduce potential disturbance, the raw-water-pipeline will be installed via directional drilling. Additionally, installation of the crossing beneath the existing CMR line will be completed in accordance with Schedule B of the RM of East St. Paul's (2011) Agreement with CMR (Attachment F).

**The effects of Project construction on infrastructure are anticipated to be local, short-term and of minor magnitude and therefore not significant.**

#### 5.2.4 Greenhouse Gas and Air Quality

The Construction Phase will involve the use of three diesel construction vehicles and several pieces of equipment. While GHG emissions associated with construction activities cannot be avoided with available construction vehicles and equipment, procedures will be followed to reduce emissions where possible. These include applying proper vehicle maintenance for more efficient engine operation as well as turning equipment off when it will not be immediately deployed.

**Potential effects of greenhouse gas emissions on air quality following implementation of mitigation measures are anticipated to be local, negligible in magnitude, reversible and not significant.**

### 5.3 OPERATIONS

#### 5.3.1 Aquifer Quality

As the Project is located on the banks of the Red River Floodway, there is potential during flooding for surface floodwater to contaminate the aquifer through springs.

In the past, it was thought that hydraulic loading of the floodwaters in the Floodway channel would enter the aquifer and cause regional and bacteriological issues with water quality. However, several studies (Render 1971; Render and Fritz 1975; Woodbury (Friesen Drillers 2012) concluded that such contamination is unlikely, particularly so with the lack of spring discharge in the channel in the area of the Bray Well. Friesen Drillers (2012) concur and note that with the passing of the flood, surface water would begin to discharge back through the springs that allowed initial entry. Furthermore, there are no known instances of groundwater contamination following any of the floods that have occurred over the past 43

years (Friesen Drillers 2012). Due to the hydraulic gradient in the carbonate aquifer and the low drawdown of the Bray Road Well, it is unlikely for the supply well to draw river water back into the aquifer (Friesen Drillers 2012).

**No adverse effects on aquifer quality are anticipated because of the Project operation.**

### 5.3.2 Aquifer Quantity

As the aquifer is susceptible to seasonal and climatic variations, under extreme conditions there is potential for the aquifer to run low.

Water levels, dependent upon conditions, can decline and recharge very quickly. Despite this, there has been very little fluctuation over the past 50 years. The RM is located near a major recharge area in the carbonate aquifer at the Birds Hill Glacio-Fluvial complex. As a result, water levels have remained constant with no detectable long-term water-level decline (Friesen Drillers 2012).

**No adverse effects on aquifer quantity are anticipated because of the Project operation.**

### 5.3.3 Socioeconomic Effects

Human health and safety concerns during operations are related to the potential for accidents to occur during maintenance. Such accidents might include injuries to workers during well monitoring or contamination of the aquifer through the well (see Attachment A – Appendix L).

The RM staff should be aware of hazards and work in accordance with the *Manitoba Workplace Safety and Health Act (2010)*.

A positive socioeconomic effect associated with operation of the Project is the provision of water for the RM and its inhabitants for domestic and commercial use.

**The socioeconomic effects of Project operations are anticipated to be both positive and adverse. With adherence to safety protocols, effects on human health and safety during operations are anticipated to be local, sporadic to continuous, short-to intermediate term in duration and low in magnitude.**

## 5.4 CUMULATIVE EFFECTS ASSESSMENT

There is potential for the operation of the Bray Well, in combination with existing wells, to cumulatively reduce, to an unknown degree, the level of water available to other domestic users in the region.

However, according to the regional hydrograph network administered by MCWS, the operation of existing wells in the RM of East St. Paul has not resulted in sustained drawdown. Potentiometric surface mapping shows very little gradient across the central area of the RM, which indicates reasonably transmissive conditions (Friesen Drillers 2012).

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As part of water-licensing requirements for MCWS, Friesen Drillers undertook a well inventory within a 1200 m-radius of the Bray Well. In addition to the May 2010 version of the GWDRILL database, information requests were sent to land owners within the radius to provide specific details of well installations; a total of 59 water wells were recorded (Attachment A - Appendix G). Friesen Drillers (2012), note that the majority of wells are fairly recently constructed (post-1970) open-hole carbonate wells with 40 to 50 feet of casing, that appear capable of dealing with several feet of static water fluctuation.

An ancillary condition of the MCWS water-licensing requirements obliges a number of well sites to be monitored during a 72-hour period. Observation wells were chosen for their proximity to Bray Well and included two MCWS hydrograph stations, residential wells, and the RM's loading station at PTH 59 and Coronation Street. The drawdown was determined to be approximately 1.27 feet after pumping for one year continuously at a rate of 491 U.S.G.P.M., which is less than annual fluctuation for this area (Attachment A).

**Based on this information, no adverse cumulative effects are anticipated because of the Project operation.**



## **6.0 Monitoring and Follow-up**

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Based on the Environmental Effects Assessment documented in Section 5.0, the only monitoring and follow-up that appears warranted is the testing of the Bray Well (once operational) during a flood event to confirm the absence of contamination as a result of flooding and the operation of the Floodway per Render's (1971) and Render and Fritz' (1975) report suggestions. More specifically, the well water quality should be tested pursuant to the Guidelines for Canadian Drinking Water Quality (Attachment H).





Conclusion  
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## **7.0 Conclusion**

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Based on the information available to date, the proposed Bray Well creates no basis for predicting any significant impacts to the biophysical or socioeconomic environments.



References  
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## 8.0 References

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### 8.1 LITERATURE CITED

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### 8.2 PERSONAL COMMUNICATIONS

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# BRAY WELL MUNICIPAL WATER SUPPLY SYSTEM EXPANSION ENVIRONMENT ACT PROPOSAL

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## 9.0 Closure

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This report was prepared on behalf of the Rural Municipality of East St. Paul. The report may not be relied upon by any other person or entity without the express written consent of Stantec Consulting Ltd. and the Rural Municipality of East St. Paul.

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The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgment of Stantec Consulting Ltd. based on the data obtained from the work and on the site conditions encountered at the time the work was performed at the specific sampling, testing, and/or observation locations.

