

# Manitoba Environment Act Proposal RM of Dauphin Rural Water System

November 2014

The Manitoba Water Services Board



## Executive Summary

The RM of Dauphin (RM) is located approximately 300 km northwest of Winnipeg and immediately north of Riding Mountain National Park, surrounding the City of Dauphin. The RM is seeking to construct a rural water distribution system to service the population of approximately 2200 people throughout the Municipality.

The RM of Dauphin requested the Manitoba Water Services Board (MWSB) to compile an Environment Act Proposal for a Class 2 Development License under the Manitoba Environment Act for a proposed rural water supply system. The proposed pipelines would service approximately 238 households throughout the Municipality. The G3 Water Co-op has been selected as the source of treated water for the system. The proposal includes the construction of 263 km of pipeline, 238 service connections in the RM, and five pressure reducing stations.

Preliminary pipeline routes are shown in Appendix A. The waterways within the proposed pipeline system are the Jackfish Creek, Edwards Creek, Spruce Creek, Mowat Creek, Vermillion River, Valley River and Wilson River. The RM of Dauphin will be responsible for operating and maintaining the rural water pipelines. An operator is required to periodically inspect flushouts, air releases, water meters, pressure reducing stations, etc. to ensure system performance is maintained. In addition, an operator will be required to submit bi-weekly water samples for bacteriological testing in accordance with the Manitoba *Drinking Water Quality Standards Regulation*. The operator is responsible to read water meters on a quarterly basis and respond to maintenance issues related to the system.

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## List of Acronyms

AO	Aesthetic Objective
DBP	Disinfection By-Product
DWSA	Drinking Water Safety Act
EAP	Environment Act Proposal
GCDWQ	Guidelines for Canadian Drinking Water Quality
G3 Co-op	G3 Regional Water Co-operative Inc
GUDI	Groundwater Under Direct Influence of Surface Water
MWSB	Manitoba Water Services Board
ODW	Office of Drinking Water
RM	Rural Municipality
TDS	Total Dissolved Solids
THM	Trihalomethanes
TOC	Total Organic Carbon
UV	Ultraviolet
WTP	Water Treatment Plant
G3	G3 Regional Water Co-operative Inc.

## **1.0 Introduction**

The RM of Dauphin requested the Manitoba Water Services Board (MWSB) to prepare an Environment Act Proposal for a Class 2 Development License under the Manitoba Environment Act for the construction of a rural water supply system in the RM of Dauphin. This document provides the compiled information required on Manitoba Conservation's Environment Act Proposal Report Guidelines and Supplementary Guidelines for Municipal Water Supply Systems.

### **1.1 Background Information**

The RM of Dauphin surrounds the City of Dauphin and is located approximately 150 km north of Brandon, bordering Riding Mountain National Park, Lake Dauphin in the east, and the RM of Gilbert Plains in the west with a population of approximately 2200 people. The G3 Water Cooperative Inc. will supply the system with treated water.

#### **1.1.1 Previous Studies**

A pipeline feasibility study was completed by the MWSB for the RM of Dauphin in January 2014. The study reviews existing infrastructure, design criteria, treated water sources, the proposed pipeline network and probable costs. The study was used in preparation of this EAP.

#### **1.1.2 Population**

Based on the 2011 Census, the RM of Dauphin has a population of 2200, representing a decrease from 2273 in 2001 and a decline from 2006 to 2011. Statistics Canada indicates that there are approximately 3 persons per family in the Municipality, and the service population of the 238 residential connections is estimated to be 714. The system growth for the next 20 years is difficult to predict at this time as well as estimating what impact a treated water distribution system would have on future development and water demands. For design purposes it would be prudent to assume growth of 0.5% per year for the next 20 years, equating to a population of 789 people or 263 residential connections.

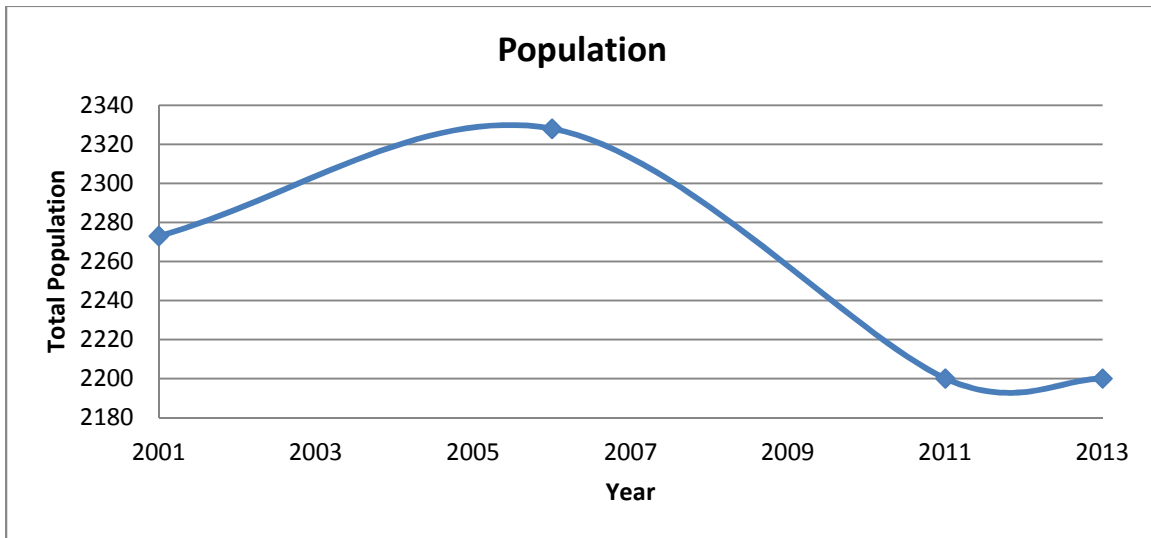


Figure 1.1 – RM of Dauphin population trends

### 1.1.3 Current and Projected Water Use of the RM of Dauphin and G3 Water Co-op

Water consumption in the RM of Dauphin will be based on a 20 year projection of 263 residential connections with a population of 789 people. When calculating water consumption, typical rates range from 250 L/person/day to 300 L/person/day and peak day usage can increase by a factor of 1.5 to 2.0. Consumptions of 300 L/person/day and a peak day factor of 1.8 were used for this study. This equates to an average day consumption of 236,700 L/day and a maximum peak day use of 426,060 L/day (5.9 L/s).

The G3 water system services Grandview, Gilbert Plains and the RM of Gilbert Plains with a total estimated service population of 1886. The quarterly water consumption for two years is provided in Table 1.1. The average water consumption of the G3 system was 571 m<sup>3</sup>/day in 2011 and 2012. A peaking factor of 1.8 and 0.5% growth is assumed for the entire system.

**TABLE 1.1 – G3 Quarterly Water Consumption in Cubic Meters**

	<b>Town of Grandview</b>	<b>RM of Gilbert Plains</b>	<b>Town of Gilbert Plains</b>
<b>Dec-11</b>	24021	10502	15378
<b>Mar-12</b>	28497	9698	14999
<b>Jun-12</b>	24047	11442	16095
<b>Sep-12</b>	24375	12850	16837
<b>Annual Total (m3)</b>	100940	44492	63309
<b>Average Day (m3)</b>	276.5	121.9	173.4
<b>Average (L/s)</b>	3.8	1.7	2.4

	<b>Town of Grandview</b>	<b>RM of Gilbert Plains</b>	<b>Town of Gilbert Plains</b>
<b>Dec-12</b>	24385	9423	15318
<b>Mar-13</b>	24232	11212	14975
<b>Jun-13</b>	28156	9880	16345
<b>Sep-13</b>	27034	10719	16764
<b>Annual Total (m3)</b>	103807	41234	63402
<b>Average Day (m3)</b>	284.4	113.0	173.7
<b>Average (L/s)</b>	4.0	1.6	2.4

The peak day of the G3 Cooperative is 1028 m<sup>3</sup>/day (2014) and 1136 m<sup>3</sup>/day (2034). The peak day demand of the combined system in 2034 would be 1562 m<sup>3</sup>/day.

$$\begin{aligned} \text{Peak day demand (L/s)} &= 5.9 \text{ L/s (RM of Dauphin)} + 15.8 \text{ L/s (G3 Co-op)} \\ &= 21.7 < 28.3 \text{ L/s G3 treatment capacity} \end{aligned}$$

The G3 WTP therefore has sufficient treatment capacity to service the proposed rural system.



**TABLE 1.2 – 20-Year Projected Consumption**

	Units	RM of Dauphin	G3 Cooperative
<b>Connections:</b>		238	
<b>Equivalent Human Population</b>		714	1886
<b>20 year future population (@0.5% /yr)</b>		789	2107
<b>Consumption/capita/day</b>	L/c/day	300	300
<b>Average Day Consumption</b>	L/day	236,700	632,100
	L/s	3.3	8.8
<b>Peak Day factor</b>		x1.8	x1.8
<b>Peak Day Consumption</b>	L/day	426,060	1,137,780
<b>Peak Day (20-hour operating day)</b>	L/s	5.9	15.8

**TABLE 1.3 – Projected 20-Year Consumption Summary**

		RM of Dauphin	G3 Co-op	TOTAL
<b>Average Day Consumption</b>	m <sup>3</sup> /day	237	632	869
<b>Peak Day Consumption</b>	m <sup>3</sup> /day	426	1138	1564

#### 1.1.4 Raw Water Source

The proposed rural water system would connect to the G3 Water Cooperative rural water pipelines in the RM of Gilbert Plains. The pipelines receive treated water from the G3 Co-op WTP located 20 km northwest of Gilbert Plains. The G3 Co-op WTP is supplied by two wells located in the municipal right-of-way 1 km north of the WTP with the backup well located 30 m south of the primary supply well. Water Rights Act License No. 2010-107 was issued to permit withdrawal not exceeding 34 L/s or a total volume of 315 cubic decameters annually.

The raw water parameters that may impact treatment and influence operation of the system under the Guideline for Canadian Drinking Water Quality (GCDWQ) include ammonia, hardness, iron, manganese, total dissolved solids, and turbidity.

#### 1.1.5 Water Rights Act

Water Rights Licence (WRL) 2010-107 was issued to the G3 Regional Water Co-operative Inc. and is attached in Appendix D. In 2012, the raw water consumption was 274.3 cubic decameters, well within the 315 cubic decameters allowed for in the G3 Co-op WRL. The maximum instantaneous rate of withdrawal as stated in the WRL is limited to 0.034 m<sup>3</sup>/s. A moderate WRL amendment would be required for the expansion to the RM of Dauphin with adequate aquifer capacity available.

### 1.1.6 Water Quality

Treated water quality results are summarized in Table 1.6. WTPs using a surface water supply are subject to seasonal variations in raw water quality that may result in variable treated water quality.

**Table 1.6 Summary of Treated Water Quality**

Parameter	Unit	GCDWQ	G3 Water Co-op (2010)
<b>Arsenic</b>	mg/L	≤ 0.01	0.00418
<b>Fluoride</b>	mg/L	≤ 1.5	0.97
<b>Hardness</b>	mg/L	200/500a	74.6
<b>Iron</b>	mg/L	≤ 0.3	< 0.020
<b>Manganese</b>	mg/L	≤ 0.05	0.00060
<b>Nitrate</b>	mg/L	≤ 10	< 0.050
<b>pH</b>		6.5-8.5	8.04
<b>Total Dissolved Solids</b>	mg/L	500	165
<b>Total Organic Carbon</b>	mg/L	-	< 0.1
<b>Total THMs</b>	mg/L	0.1	0.0035
<b>True Color</b>	CU	15	< 5.0
<b>Turbidity</b>	NTU	≤ 0.3 / 0.1c	0.25
<b>Uranium</b>	mg/L	≤ 0.02	< 0.00010
<sup>a</sup> Hardness levels greater than 200 are considered poor but tolerable. Hardness levels greater than 500 are generally considered unacceptable			
<sup>b</sup> THM based on average of quarterly samples			
<sup>c</sup> Turbidity limits as follows: 1.0 NTU for slow sand or diatomaceous earth filtration, 0.3 NTU for chemically assisted filtration, and 0.1 NTU for membrane filtration			

The treated water quality meets all health and aesthetic standards identified in the Guidelines for Canadian Drinking Water Quality. The G3 Water Co-op produces softened water of high quality with minimal THM formation potential.

### 1.1.7 Compliance to Drinking Water Regulations

*The Drinking Water Safety Regulation and Drinking Water Quality Standards Regulation* under the *Drinking Water Safety Act* were proclaimed in February 2007 to ensure public water systems provide safe drinking water. These regulations outline water quality standards, bacteriological and microbial standards, operating licence requirements, disinfection testing and monitoring, and reporting requirements.

Reporting requirements under the *Drinking Water Safety Act* include the submission of: scheduled test results, events of non-compliance or emergencies, compliance plans, emergency response plans, public water system reports, and public water system engineering assessments. In comparison of groundwater to surface water supply systems, surface water has greater health concerns and hence greater regulatory and operational requirements. Surface water supplies must be treated and disinfected to

control viruses and parasites (*Giardia lamblia* cysts & *Cryptosporidium* oocysts). Generally this is achieved by having adequate surface water treatment technology, reservoir storage for chlorine contact time and UV disinfection for the destruction or inactivation of *Giardia* & *Cryptosporidium*.

Surface water systems must satisfy THM and turbidity standards. Turbidity and THMs are also a health concern with surface water systems. THMs are a group of chemical compounds that form when chlorine reacts with dissolved organic material in water. The THM objective of 100 µg/L is based on a quarterly average of the total of the four most common THM compounds (bromodichloromethane, bromoform, chloroform, and dibromochloromethane) found in drinking water. THMs are linked to birth defects and are considered a human carcinogen.

Groundwater supplies under direct influence of surface water (GUDI) have treatment requirements similar to surface water supplies.

G3 Co-op WTP is in general compliance with The DWSA, GCDWQ and the Ten State Standards.

## 2.0 Description of Proposed Development

### 2.1 Project Description

Based on a peak day water flow rate, three pipeline network options were designed to distribute water to the 238 residences with potential of providing additional capacity for future connections. The three proposed design options are outlined below and a proposed conceptual layout of the pipeline network for each option is included in Appendix A.

The proposed pipelines would be installed in government road allowances and PTH right-of-ways with some private easements to facilitate construction if necessary. Mainlines are installed in ditches with service lines installed directly into each serviced residence. The pipeline will be constructed of Polyvinyl Chloride (PVC) or High Density Polyethylene (HDPE) with a service life of more than 40 years.

#### 2.1.1 The G3 Water Co-operative Treated Water Supply

The proposed development in the RM of Dauphin would consist of 250 km of 50 mm to 150 mm diameter water pipelines. Due to the location of the water treatment plant and elevation differences throughout the pipeline system, five pressure reducing stations will be required. To connect to the G3 Water Co-operative an additional 13 km of pipeline (100 mm and 150 mm diameter) and 13 km of 100mm pipeline to the Sifton area is required.

##### 2.1.1 Operation and Maintenance

The RM of Dauphin will be responsible for maintaining the rural water pipelines. An operator is required to periodically inspect flushouts, air releases, water meters, pressure reducing stations, booster pumping stations etc., to ensure system performance is maintained. In addition, the operator will be required to submit bi-weekly water samples for bacteriological testing in accordance with the Manitoba *Drinking Water Quality Standards Regulation*. The system operator will also be required to read water meters on a quarterly basis and respond to maintenance issues related to the system.

### 2.2 Certificate of Title

It is proposed to locate the rural water pipeline within municipal and provincial road right-of-ways owned by the Crown. If necessary, private easements will be obtained to accommodate the pipeline.

### 2.3 Existing and Adjacent Land Use

The proposed land for the development will be on municipal and provincially owned land in previously disturbed road right-of-ways. Adjacent land is used for mainly agricultural and related

industries. The existing and adjacent land uses will not change as a result of the proposed development.

## **2.4 Land Use Designation and Zoning**

Zoning designation for the pipelines on municipal owned land is not applicable.

## **2.5 Project Schedule**

The project is a multi-year phased construction approach that is scheduled to commence in the 2015 or 2016 construction season depending on the availability of funding and the receipt of all approvals.

## **2.6 Project Funding**

This project is eligible for cost sharing between the MWSB and the RM of Dauphin subject to the approval of the project and the availability of funding. Mainline installations qualify for 50% funding and rural distribution qualifies for 1/3 funding once approved by the MWSB. Additional funding for large agricultural users may be applied for through the Growing Adaptation Program from the Federal Government.

## **2.7 Regulatory Approvals**

The following branches/departments will be provided with copies of plans and specifications for information purposes and for the purposes of approvals and agreements:

Manitoba Conservation and Water Stewardship  
Office of Drinking Water  
Manitoba Infrastructure and Transportation

The contractor will be required to contact MTS, Hydro, and gas utilities for utility locations and approvals.

## **2.8 Public Consultation**

A public consultation will be held to present and discuss the proposed rural water distribution system to the citizens of the RM of Dauphin. Citizens will be allowed to provide feedback on the proposed development. It is not expected that there will be major concerns forwarded to the municipality regarding the rural water system.

## **2.9 Storage of Petroleum Products and Other Chemicals**

Fuel will not be stored on-site at any time or location along the proposed construction route or near any well. Fuel will be supplied by fuelling trucks which are regulated under The Storage and Handling of Petroleum Products and Allied Products Regulation. Records of fuel volumes and an

emergency response plan which includes spill prevention, notification and response will be implemented. No fuelling activities will be permitted within 100 m of watercourses during construction. During construction, the contractors will be required to ensure that all equipment is properly maintained to prevent leaks of fuel and motor fluids.

There will be no storage of petroleum products or other chemicals at any of the well sites during operation of the proposed development. General household cleaning products will also be stored at this site.

## **3.0 Physical Environment**

### **3.1 Physiographic Setting and Climate**

The RM of Dauphin is located approximately 300 km northwest of Winnipeg and immediately north of Riding Mountain National Park, surrounding the City of Dauphin. The RM is seeking to construct a rural water distribution system to service the population of approximately 2200 people throughout the Municipality.

The municipality is situated in the plains on the north side of the Riding Mountain escarpment in the Parklands region. Various streams from the mountain flow through the plain and to Lake Dauphin on the east side of the municipality. Due to elevation changes, booster stations and pressure reducing stations will be required.

Based on Environment Canada climatic data, the mean annual temperature in the area is 1.7 degrees Celsius with below zero average daily temperature from November through March. Mean annual precipitation is approximately 492.0 mm.

### **3.2 Hydrogeology**

The RM of Dauphin is located in the Canadian Shield hydrogeological region. Early investigations of the hydrogeology of the area identified the main aquifer types in this area include sandstone and sand and gravel deposits. The bedrock beneath the area consists of shale and sandstone beds.

The Lake Manitoba Plain eco-region is typically underlain by limestone bedrock which is covered by extremely calcareous broadly ridged glacial tills in the northern half and by smooth level, lacustrine sands, silts, and clays in the southern half.

### **3.3 Hydrology**

The waterways within the geography of the proposed pipeline system include the Vermillion River, Valley River, Wilson River, Jackfish Creek, Edwards Creek, Spruce Creek, Mowat Creek and all associated tributaries. Appendix B shows a detailed map of the hydrology of the area.

### **3.4 Fish and Fish Habitat**

Potential fish habitat in the project area includes the Vermillion River, Valley River, Wilson River, Jackfish Creek, Edwards Creek, Spruce Creek, Mowat Creek and all associated tributaries. A list of fish species found in the Vermillion River, Valley River, Wilson River, Jackfish Creek and Edwards Creek has been included in Appendix C.

### **3.5 Wildlife Habitat and Vegetation**

The project area is located within the Lake Manitoba Plain Eco-region of the Prairies eco-zone (Agriculture and Agri-Food Canada). The mean annual temperature in the region ranges from 2° C to 3° C with a mean summer temperature of 16° C and a mean winter temperature of -12° C. The Manitoba Lake Plain eco-region is mainly associated with shrubs, trembling aspen, grass species and bur oak on the Black Chernozomic soils with willow and sage on the Gleysolic soils. The soils in the region are mainly Gleysolic and Black Chernozems. There is considerable production of corn, spring wheat, oilseeds, hay, and livestock in the region. Hunting and water oriented recreation are significant uses of land in the region. Characteristic mammals in the eco-region include waterfowl, white-tailed deer, coyote, rabbit, and ground squirrel. Bird species in the prairies eco-zone include ferruginous hawk, Swainson's hawk, American avocet, borrowing owl, great blue heron, black-billed magpie, northern oriole, veery and brown thrasher (National Ecological Framework Report).

### **3.6 Socioeconomic**

The project area is located within the RM of Dauphin. The RM has an area of 1,516.1 km<sup>2</sup> and a population of 2,200 (2011 Census). The main economic base is agriculture, and the project is anticipated to create additional temporary employment and long term positive economic benefit to the area.

### **3.7 Heritage Resources**

Construction activities will occur in previously disturbed municipal and provincial right-of-ways. The proponent will work with Heritage Resources Branch to mitigate any concerns as required.



## **4.0 Potential Environmental Effects**

An environmental effect includes any change that the project may cause to the environment. Environmental effects were identified from interactions between proposed project activities and environmental components. Mitigation measures and follow-up activities were identified for environmental effects determined to be adverse.

### **4.1 Air Quality**

During construction, dust will be raised by construction equipment and there will be gaseous and particulate emissions from the construction equipment. Water spraying is an important, common and practical procedure that would be applied as required to alleviate potential dust problems. Emissions of gases and particulates would be minimized by keeping machinery in good working order. Any effects would be localized, temporary and insignificant. During operation of the development there will be no releases of pollutants to the air.

### **4.2 Soils**

During construction, there is a risk of fuel or lubricant spills from heavy equipment and vehicle operation. The storage of fuel or lubricants within the area of the well construction site will not be allowed. Therefore, the potential spills will be very small in size and standard construction spill clean-up procedures, including the removal of any impacted soil, will be used to prevent impact.

During operation, project activities are limited to regular monitoring and maintenance activities that have a negligible effect on soil disturbance and compaction because of low vehicle traffic and the use of established routes to access the wells and water treatment plant. Regular monitoring and maintenance activities will have a negligible effect on soil contamination since fuel trucks and other hazardous substances will not be brought on-site on a regular basis. The potential adverse effect on soil quality is assessed to be minor.

### **4.3 Surface Water, Fish and Fish Habitat**

Minor and short term impacts on surface water may occur as a result of construction activity in road allowance ditches during runoff events. The impact on surface water would include sediment that may be eroded from excavation activities, minor engine leaks and potential fuel spills should runoff events occur during construction. Horizontal directional drilling will be conducted to install the pipeline at the drain and river outlets. This will eliminate excavation within the riparian zone and minimize impacts. There is potential for some loss of drilling mud to surface water. Impacts to fisheries and fish habitat are considered minor.

#### **4.4 Groundwater Quality**

Groundwater quality can be impacted by surface activities and surface water quality. Mitigation measures are necessary to protect groundwater quality during construction activities. The proposed activities are unlikely to result in adverse changes to groundwater quality.

#### **4.5 Groundwater Levels**

If required an amendment to the Water Rights Act Licence will be applied for prior to construction, though no significant impacts are anticipated from the project. Groundwater monitoring will be conducted by the G3 Co-op as required.

#### **4.6 Vegetation**

Construction will occur primarily within municipal right-of-ways or easements that are previously disturbed, regularly managed and comprised primarily of grasses. As the areas are already disturbed, they are unlikely to contain rare plant species. The amount of vegetation disturbance is expected to be minimal.

During construction access to land will be restricted to designated and previously disturbed areas. Potential effects to vegetation are considered to be negligible.

#### **4.7 Wildlife Habitat and Vegetation**

The construction and operation activities associated with this project will be limited to areas already developed for hydro lines or urban or agricultural uses. The potential adverse effects of wildlife habitat loss were assessed to be negligible to minor.

#### **4.8 Noise and Vibration**

During the construction phase of the project, there will be several sources of sound emissions including equipment used for construction. The types of noises heard due to construction are dominated by equipment engines. However, miscellaneous short term impact noises (ie: dump truck gates, back hoe buckets) are often heard. The noise will be in addition to regular community and highway activities, and the effects are considered minor.

Scheduling of various site activities can minimize the impact of noise. This would include scheduling construction for day-time hours to avoid sleep disturbance and the disruption of evening domestic activities. All equipment used on site will be fitted with appropriate mufflers and will be maintained in good working order to minimize noise levels.

#### **4.9 Employment/Economy**

Socio-economic implications are not expected as a result of environmental impacts as impacts are considered minor and short-term. Some economic implications may exist for the

Municipality due to the costs of developing the water system, however, the Municipality will have a sustainable potable water supply to meet future demands. There may be some local economic benefit during construction. The potential effects of the project on employment and the economy were assessed to be positive.

#### **4.10 Human Health and Well Being**

The potential adverse effects of the project on human health are assessed to be negligible to minor. Short term temporary increases in noise and dust emissions will occur during construction that is considered to be minor effects. During operation, there will be a minor increase in vehicular traffic associated with monitoring and maintenance activities. The potential effects are considered minor.

The project will result in the construction of the pipeline designed and operated to produce a treated water supply to meet current water quality standards. The effects of this on human health and well being are considered positive.

#### **4.11 Climate Change**

There are no predicted impacts to climate as a result of the project activities.

## **5.0 Environmental Management Measures**

Environmental management practices proposed to prevent or mitigate environmental effects that were determined to be adverse are identified and described below.

### **5.1 Air Quality**

Emissions resulting from construction and transportation equipment may be mitigated by the utilization of well maintained and operating vehicles while reducing unnecessary vehicle idling.

The impact of dust may be mitigated by the use of an approved dust suppressant, limiting construction during high wind periods, and re-establishing vegetation as soon as possible.

### **5.2 Soils**

Mitigation to potential impacts to soil by contamination from petroleum products include preparation of an emergency response plan for potential spills, use of spill clean-up equipment and materials, using properly maintained equipment, and using appropriate fuelling equipment.

Re-establishment of vegetation as soon as possible after disturbance will limit loss of soil due to wind or water erosion. Backfilling with soil stockpiles as soon as possible and minimizing the amount of soil disturbance can be implemented.

### **5.3 Surface Water**

Mitigation of surface water issues may be achieved by limiting open cut trenching to within 30 m ahead or behind the pipe laying, redirecting surface water runoff, pumping accumulated water to adjacent ditches and providing erosion control practices as required.

Petroleum leaks or spills will be mitigated by use of properly maintained equipment, use of spill clean-up equipment and materials, and use of appropriate fuelling equipment. A prepared emergency response plan can be implemented in the event of a significant spill. In the event of a reportable spill, Manitoba Conservation and Water Stewardship will be notified through the emergency response line and appropriate measures will be taken according to Manitoba Conservation and Water Stewardship requirements.

A 100 m setback to watercourses will be maintained for fuelling activities. Horizontal directional drilling will be implemented at watercourse crossings. Vehicles will avoid entering the riparian zones. Re-establishment of vegetation will occur as soon as possible on areas of disturbed soil.

Chlorinated water used to disinfect pipelines will be de-chlorinated and not released to surface waters.

## **5.4 Groundwater**

Mitigation of potential groundwater impacts from petroleum products can be mitigated as described in Section 5.3. Any long term changes in groundwater quality will be observed from periodic WTP raw water samples taken by the G3 Co-op WTP.

The availability of groundwater usage for this proposal and potential future users will be assessed through the Water Rights Act Licensing process. Groundwater monitoring will be performed as required.

## **5.5 Vegetation and Wildlife**

Re-establishment of vegetation will occur as soon as possible on disturbed areas. Impacts to wildlife habitat can be limited by minimizing the area of construction, soil disturbance and vegetation disturbance. Other impacts resulting from dust or smoke will be minimized as previously indicated. Noise disturbance will be limited by use of muffling vehicles and equipment, limiting idling and limiting the construction area.

## **5.6 Fisheries**

Fisheries impacts will be minimized by implementing practices to reduce soil and contaminate runoff as previously mentioned in Sections 5.3 and 5.5. In addition, horizontal directional drilling will occur under all watercourses containing water. The required excavation needed to introduce the drilling equipment will be maintained outside watercourse riparian zones.

## **5.7 Noise and Vibration**

Limiting any noise-creating activities, including regular maintenance and monitoring activities to normal working hours, and limiting unnecessary long-term idling can mitigate any potential increased noise and vibration effects.

## **5.8 Water Conservation**

Water conservation measures include metering and pricing of water. Water conservation information in water bill mailings can be implemented. Leak detection will consist of reconciling the volume of water pumped and charged to ratepayers on a quarterly basis. Since services are metered, abnormalities can be identified and rectified.

## **5.9 Socio-Economic Implications**

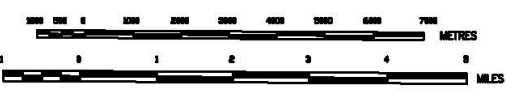
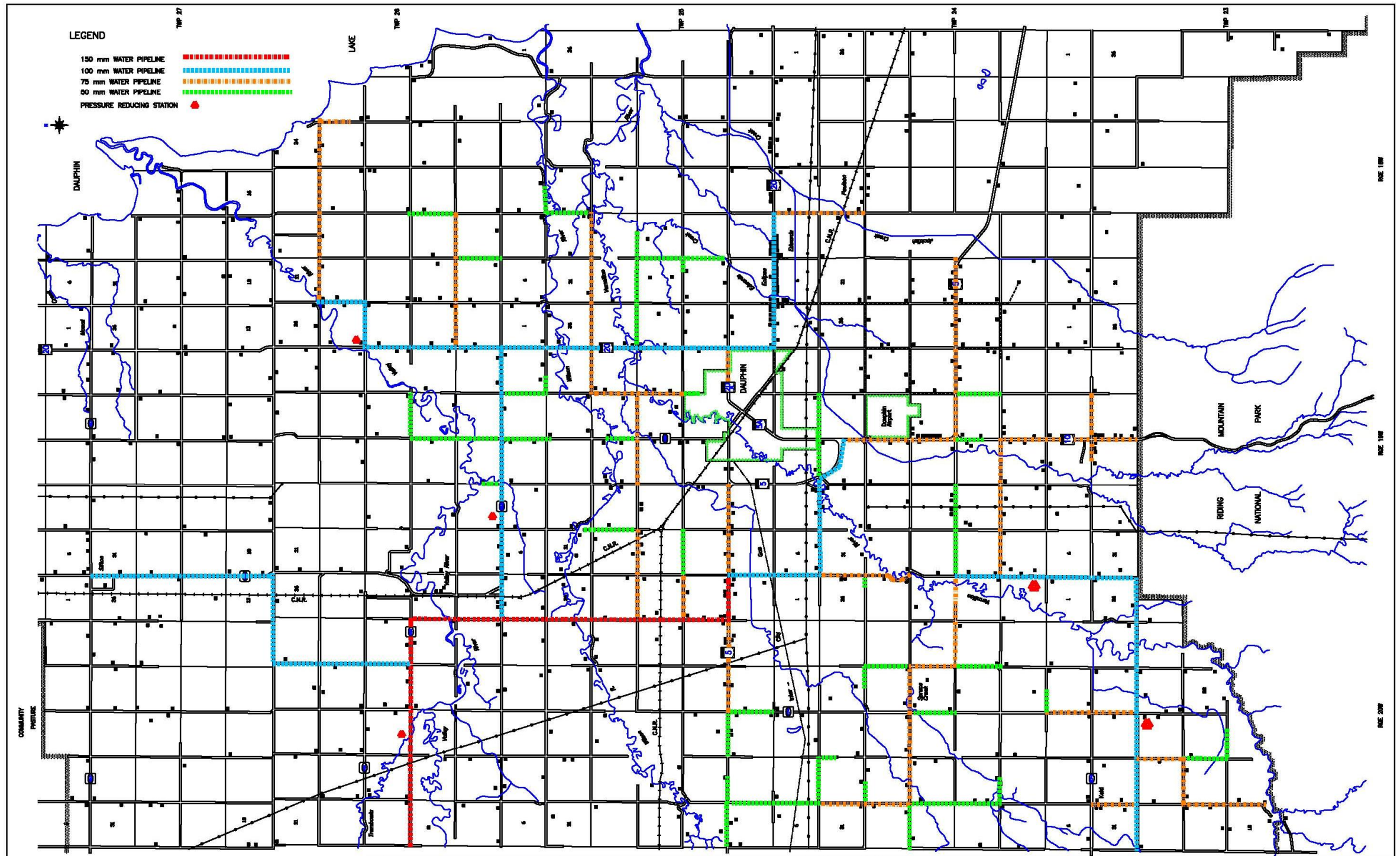
There are no known negative environmental socio-economic impacts that need mitigation. Since the proposed development would provide a reliable healthy drinking water supply, it would be expected to enhance quality of life and economic viability for the Municipality. The proposed project may provide some economic benefits to the area for local businesses and employment opportunities during construction phase.

## 6.0 References

- a. Agriculture and Agri-Food Canada. A National Ecological Framework for Canada 29 July 2013  
<<http://sis.agr.gc.ca/cansis/nsdb/ecostrat/index.html>>
- b. Ecological Framework For Canada. National Ecological Framework Report. 1995.  
<http://sis.agr.gc.ca/cansis/publications/ecostrat/intro.html>
- c. Statistics Canada. 2012. Dauphin, Manitoba (Code 4617048) and Manitoba (Code 46) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed July 29, 2013).

## **Appendix A**

### Preliminary Pipeline Route



NO.	DESCRIPTION	BY	DATE

DESIGNED	DATE
DRAWN	DATE
CHECKED	DATE
REVIEWED	DATE

PROVINCE OF MANITOBA  
**THE MANITOBA WATER SERVICES BOARD**  
 MANITOBA LOCAL GOVERNMENT

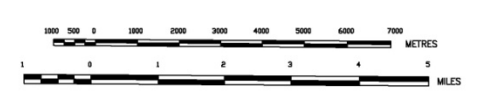
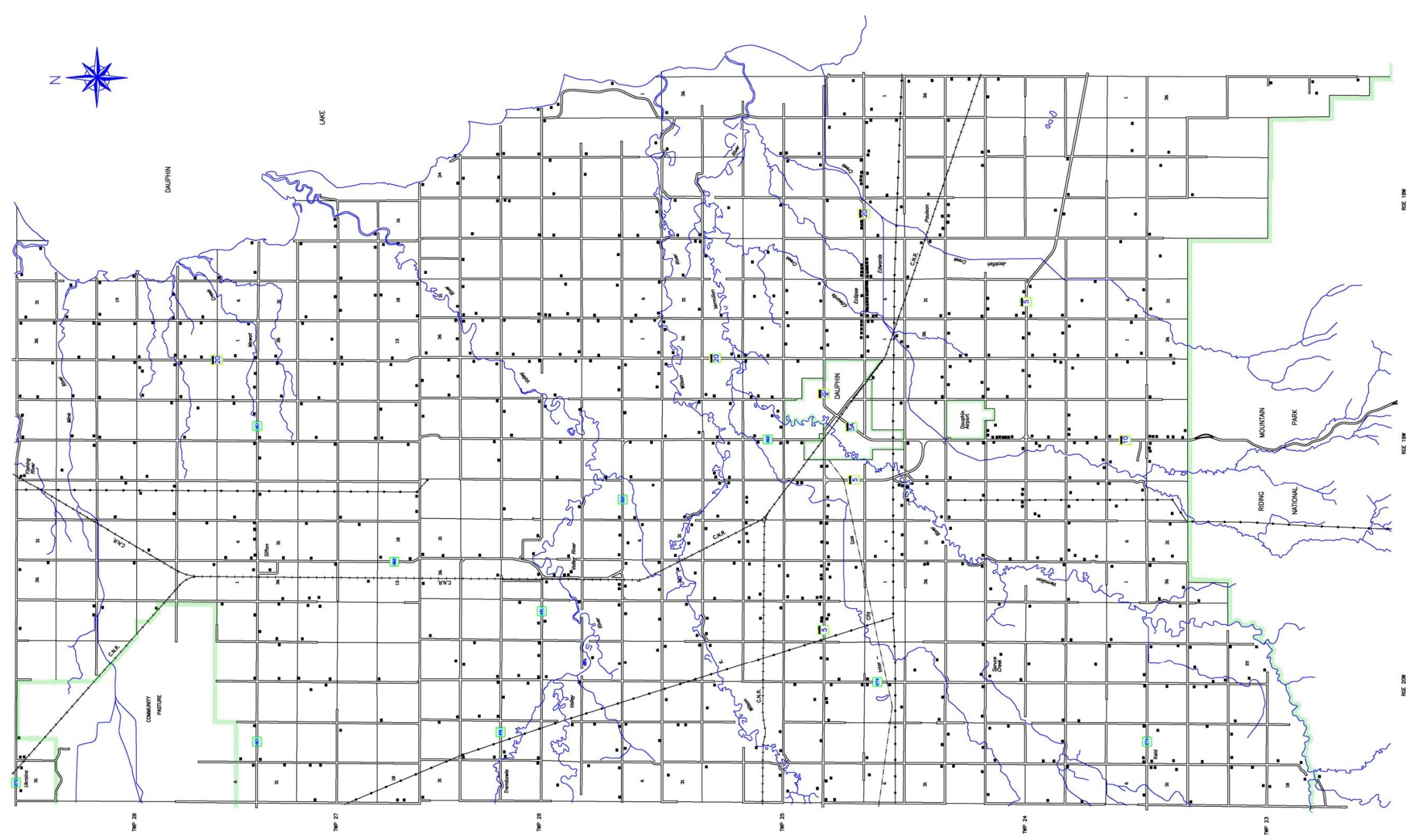
R.M. OF DAUPHIN  
 RURAL WATER PIPELINES  
**2007 CONCEPTUAL**  
 (RM GILBERT PLAINS WATER SOURCE)  
**OPTION 1**

SCALE	DATE	PROJECT NUMBER	REVISION	SHEET
AS SHOWN	12-08-08			



## **Appendix B**

Hydrology of the RM of Dauphin



NO.	DESCRIPTION	BY	DATE

SURVEYED	BOOK NUMBER
DRAWN	RWN
DESIGNED	
CHECKED	
REVIEWED	

PROVINCE OF MANITOBA  
 THE MANITOBA WATER SERVICES BOARD  
 DEPARTMENT OF INTERGOVERNMENTAL AFFAIRS

SUBMITTED: \_\_\_\_\_ APPROVED: \_\_\_\_\_

CHIEF ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_ GENERAL MANAGER: \_\_\_\_\_ DATE: \_\_\_\_\_

R.M. OF DAUPHIN		BASE MAP	
SCALE	DATE	PROJECT NUMBER	REVISION
AS SHOWN	00-01-01		
SHEET		OF	

## **Appendix C**

Fish Species in Edward Creek, Jackfish Creek, Valley River, Vermillion River and Wilson River

**Waterbody: Edwards Creek**

Provincial Waterbody Id # 4239.00      Watershed 5LJE      Region Western      District Dauphin      Map Sheet 62004      Latitude: 51 8 0  
 Longitude: 99 59 30

**BIOLOGY**

Presence

BLACKNOSE DACE <i>Rhinichthys atratulus</i>	Common
BRASSY MINNOW <i>Hybognathus hankinsoni</i>	Common
BROOK STICKLEBACK <i>Culaea inconstans</i>	Common
BROOK TROUT <i>Salvelinus fontinalis</i>	Unknown
BURBOT <i>Lota lota</i>	Uncommon
COMMON SHINER <i>Notropis cornutus</i>	Common
CREEK CHUB <i>Semotilus atromaculatus</i>	Common
EMERALD SHINER <i>Notropis atherinoides</i>	Common
FATHEAD MINNOW <i>Pimephales promelas</i>	Common
FINESCALE DACE <i>Phoxinus neogaeus</i>	Common
IOWA DARTER <i>IOWA DARTER exilis</i>	Common
JOHNNY DARTER <i>Eltheostoma nigrum</i>	Common
LOGPERCH <i>Percina caprodes</i>	Common
LONGNOSE DACE <i>Rhinichthys cataractae</i>	Common
NORTHERN PIKE <i>Esox lucius</i>	Uncommon
QUILLBACK <i>Cariacodus cyprinus</i>	Common
RIVER DARTER <i>Percina shumardi</i>	Common
SHORTHEAD REDHORSE <i>Moxostoma</i>	Common
SPOTTAIL SHINER <i>Notropis hudsonius</i>	Common
WALLEYE <i>Stizostedion vitreum</i>	Uncommon
WHITE SUCKER <i>Catostomus commersoni</i>	Common
YELLOW PERCH <i>Perca flavescens</i>	Uncommon

**Creel**

Year	Species	Catch/Unit Effort*
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\*Catch/Unit Effort = Catch/Hour

<b>Waterbody: Jackfish Creek</b>		<b>Provincial Waterbody Id #</b> 2309.00	<b>Watershed</b> SOAC	<b>Region</b> Western	<b>District</b> Killarney	<b>Map Sheet</b> 62G04	<b>Latitude:</b> 49 9 0 <b>Longitude:</b> 99 38 22
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### Habitat Suitability

Seasonal Habitat Suitability\*

All	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	None
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

\*The month(s) the waterbody is useable for fish Habitat (without human intervention)

### Resource Access

Resource	Distance (km)

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### Habitat Classifications

Habitat Class	Class

### General Uses

General Use	Harvest Weight

---

### Needed Improvements

Year	Improvements	Comments
2004	Note: There has been a name change: blacknose dace ( <i>Rhinichthys atratulus</i> ) is now known as western blacknose dace ( <i>Rhinichthys obtusus</i> ) according to Stewart and Watkinson.	
2005	The creek has lots of undercut banks. Trees and grasses are along the creek banks. Areas of the creek have very little flow. Nearby cattle have had impacts on the creek. The substrate is mainly clay/mud with some submerged vegetation. 1999  Milani's "2002-2004 Agricultural Drain Inventory" in addition to Barbour et al. which may also be found online at <a href="http://www.epa.gov/OWOW/monitoring/techmon.html">http://www.epa.gov/OWOW/monitoring/techmon.html</a> . 1999  Note: Milani conducted a visual-based habitat assessment on this waterbody. The parameters of this assessment are outlined in (continued)	"Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition" by Barbour, Gerritsen, Snyder and Stribling. For the condition category of each habitat parameter consult (continued)

### BIOLOGY

	Presence
BLACKNOSE DACE <i>Rhinichthys atratulus</i>	Unknown
BROOK STICKLEBACK <i>Culaea inconstans</i>	Unknown
COMMON SHINER <i>Notropis cornutus</i>	Unknown
CREEK CHUB <i>Semotilus atromaculatus</i>	Unknown
FATHEAD MINNOW <i>Pimephales promelas</i>	Unknown
FINESCALE DACE <i>Phoxinus neogaeus</i>	Unknown
WHITE SUCKER <i>Catostomus commersoni</i>	Unknown

### Creel

Year	Species	Catch/Unit Effort*

\*Catch/Unit Effort = Catch/Hour

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<b>Waterbody: Jackfish Creek</b>		<b>Provincial Waterbody Id #</b> 2757.00	<b>Watershed</b> 5OJB	<b>Region</b> Central	<b>District</b> Selkirk	<b>Map Sheet</b> 62103	<b>Latitude:</b> 50 13 26 <b>Longitude:</b> 97 12 23
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### Habitat Suitability

Seasonal Habitat Suitability\*

All	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	None
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

\*The month(s) the waterbody is useable for fish Habitat (without human intervention)

### Resource Access

Resource	Distance (km)

### Habitat Classifications

Habitat Class	Class

### General Uses

General Use	Harvest Weight

### Needed Improvements

Year	Improvements	Comments
2005	The creek is dry in areas with grasses throughout. The creek substrate is primarily composed of mud and submerged vegetation. Algal mats are throughout the drain.	
1999	Milani's "2002-2004 Agricultural Drain Inventory" in addition to Barbour et al., which may also be found online at <a href="http://www.cpe.gov/OWQW/monitoring/tchmten.html">http://www.cpe.gov/OWQW/monitoring/tchmten.html</a> . 1999	"Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition" by Barbour, Gerritsen, Snyder and Stribling. For the condition category of each habitat parameter consult (continued)

Note: Milani conducted a visual-based habitat assessment on this waterbody. The parameters of this assessment are outlined in (continued)

### BIOLOGY

Species	Presence
BLACKSIDED DARTER <i>Percina maculata</i>	Unknown
CENTRAL MUDMINNOW <i>Umbra limi</i>	Unknown
WHITE SUCKER <i>Catostomus commersoni</i>	Common
YELLOW PERCH <i>Perca flavescens</i>	Unknown

### Creel

Year	Species	Catch/Unit Effort*

\*Catch/Unit Effort = Catch/Hour

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Page 1 of 1

Waterbody: Jackfish Creek									
Provincial Waterbody Id #	Watershed	Region	District	Map Sheet	Latitude:	50 45 3			
3580.00	5MFB	Western	Riding	62K16	Longitude:	100 14 23			

BIOLOGY		Presence
BLACKNOSE DACE <i>Rhinichthys atratulus</i>		Unknown
BLACKSIDED DARTER <i>Percina maculata</i>		Unknown
BROOK STICKLEBACK <i>Culaea inconstans</i>		Unknown
FATHEAD MINNOW <i>Pimephales promelas</i>		Unknown
IOWA DARTER <i>IOWA DARTER exile</i>		Unknown
JOHNNY DARTER <i>Etheostoma nigrum</i>		Unknown
WHITE SUCKER <i>Catostomus commersoni</i>		Common
YELLOW PERCH <i>Perca flavescens</i>		Unknown


  

Creel		
Year	Species	Catch/Unit Effort*
*Catch/Unit Effort = Catch/Hour		

Water Chemistry									
Code	Samples	Low	High	Average	MSWQO LO	MSWQO HI	CWQG LO	CWQG HI	
<b>Sample Dates:</b> 2004-07-19									
<b>Inorganic</b>									
Disolved Oxygen	1			7.4800			5.000 mg/L	9.500 mg/L	
Ph (Ph Units)	1			7.9100	6.500 unit	9.000 unit	6.500 unit	9.000 unit	
<b>Physical</b>									
Conductivity (mho/cm)	1			332.0000					
Tempurature (C)	1			27.5000					
Turbidity (NTU Or JTU)	1			0.7300					
<b>Sample Dates:</b> 2001-04-09									
<b>Inorganic</b>									
Ph (Ph Units)				7.3000	6.500 unit	9.000 unit	6.500 unit	9.000 unit	
Sulphate				33.0000					
<b>Physical</b>									
Alkalinity (Total)				0.0000					
Conductivity (mho/cm)				350.0000					
Hardness (Total)				200.0000					
MSWQO = Manitoba Surface Water Quality Objectives CWQG = Canadian Water Quality Guidelines									

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Waterbody: Jackfish Creek									
Provincial Waterbody Id #	Watershed	Region	District	Map Sheet	Latitude:	51 8 2			
4241.00	5LJE	Western	McCreary	62004	Longitude:	99 55 59			

BIOLOGY		Presence
BLACKNOSE DACE <i>Rhinichthys atratulus</i>		Unknown
BLACKNOSE SHINER <i>Notropis heterolepis</i>		Common
COMMON SHINER <i>Notropis cornutus</i>		Common
CREEK CHUB <i>Semotilus atromaculatus</i>		Common
EMERALD SHINER <i>Notropis atherinoides</i>		Unknown
FATHEAD MINNOW <i>Pimephales promelas</i>		Unknown
WHITE SUCKER <i>Catostomus commersoni</i>		Common


  

Creel		
Year	Species	Catch/Unit Effort*
*Catch/Unit Effort = Catch/Hour		

Water Chemistry									
Code	Samples	Low	High	Average	MSWQO LO	MSWQO HI	CWQG LO	CWQG HI	
<b>Sample Dates:</b> 2002-05-21									
<b>Inorganic</b>									
Dissolved Oxygen	1			12.1700			5.000 mg/L	9.500 mg/L	
Ph (Ph Units)	1			8.4300	6.500 unit	9.000 unit	6.500 unit	9.000 unit	
<b>Physical</b>									
Conductivity (mho/cm)	1			497.0000					
Temperature (C)	1			16.1000					
<b>Sample Dates:</b> 2002-04-19									
<b>Inorganic</b>									
Dissolved Oxygen	1			11.5000			5.000 mg/L	9.500 mg/L	
Ph (Ph Units)	1			8.5400	6.500 unit	9.000 unit	6.500 unit	9.000 unit	
<b>Physical</b>									
Conductivity (mho/cm)	1			415.0000					
Temperature (C)	1			0.9000					
MSWQO = Manitoba Surface Water Quality Objectives CWQG = Canadian Water Quality Guidelines									

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Waterbody: Valley River

Provincial Waterbody Id #  
4266.00

Watershed  
5LJG

Region  
Western

District  
Dauphin

Map Sheet  
62005

Latitude: 51 20 49  
 Longitude: 99 54 48

**BIOLOGY**

Presence

BLACKCHIN SHINER <i>Notropis heterodon</i>	Unknown
BLACKNOSE DACE <i>Rhinichthys atratulus</i>	Uncommon
BLACKNOSE SHINER <i>Notropis heterolepis</i>	Common
BRASSY MINNOW <i>Hybognathus hankinsoni</i>	Uncommon
CARP <i>Cyprinus carpio</i>	Uncommon
COMMON SHINER <i>Notropis cornutus</i>	Abundant
EMERALD SHINER <i>Notropis atherinoides</i>	Common
FATHEAD MINNOW <i>Pimephales promelas</i>	Abundant
FINESCALE DACE <i>Phoxinus phoxinus</i>	Rare
GOLDEN SHINER <i>Notemigonus crysoleucas</i>	Rare
GOLDEYE <i>Hiodon alosoides</i>	Rare
IOWA DARTER <i>IOWA DARTER exilis</i>	Uncommon
JOHNNY DARTER <i>Etheostoma nigrum</i>	Uncommon
LOGPERCH <i>Percina caprodes</i>	Common
LONGNOSE DACE <i>Rhinichthys cataractae</i>	Uncommon
NORTHERN PIKE <i>Esox lucius</i>	Uncommon
PEARL DACE <i>Semotilus margarita</i>	Uncommon
QUILLBACK <i>Cariacodus cyprinus</i>	Uncommon
RIVER DARTER <i>Percina shumardi</i>	Uncommon
SAUGER <i>Stizostedion canadense</i>	Rare
SHORTHEAD REDHORSE <i>Moxostoma</i>	Common
SILVER REDHORSE <i>Moxostoma anisurum</i>	Uncommon
SPOTTAIL SHINER <i>Notropis hudsonius</i>	Abundant
TROUT PERCH <i>Percopsis omiscomaycus</i>	Unknown
WALLEYE <i>Stizostedion vitreum</i>	Uncommon
WHITE SUCKER <i>Catostomus commersoni</i>	Abundant
YELLOW PERCH <i>Perca flavescens</i>	Abundant

**Creel**

Year	Species	Catch/Unit Effort*
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\*Catch/Unit Effort = Catch/Hour

Waterbody: Valley River		Provincial Waterbody Id #	Watershed	Region	District	Map Sheet	Latitude:	Longitude:
		4267.00	5LJH	Western	Roblin	62005	51 21 32	99 54 31
1999								
Milani's "2002-2004 Agricultural Drain Inventory" in addition to Barbour et al., which may also be found online at <a href="http://www.epa.gov/DWOW/monitoring/techmon.html">http://www.epa.gov/DWOW/monitoring/techmon.html</a> .								
BIOLOGY		Presence						
BLACKNOSE DACE <i>Rhinichthys atratulus</i>	Common							
BRASSY MINNOW <i>Hybognathus hankinsoni</i>	Unknown							
COMMON SHINER <i>Notropis cornutus</i>	Common							
CREEK CHUB <i>Semotilus atromaculatus</i>	Unknown							
EMERALD SHINER <i>Notropis atherinoides</i>	Unknown							
FATHEAD MINNOW <i>Pimephales promelas</i>	Unknown							
FINESCALE DACE <i>Phoxinus neogaeus</i>	Unknown							
IOWA DARTER <i>IOWA DARTER exile</i>	Unknown							
JOHNNY DARTER <i>Etheostoma nigrum</i>	Common							
LOGPERCH <i>Percina caprodes</i>	Unknown							
LONGNOSE DACE <i>Rhinichthys cataractae</i>	Unknown							
NORTHERN PIKE <i>Esox lucius</i>	Unknown							
PEARL DACE <i>Semotilus margarita</i>	Unknown							
RIVER DARTER <i>Percina shumardi</i>	Unknown							
WHITE SUCKER <i>Catostomus commersoni</i>	Unknown							
YELLOW PERCH <i>Perca flavescens</i>	Unknown							
Creel		Year	Species	Catch/Unit Effort*				
*Catch/Unit Effort = Catch/Hour								

Waterbody: Vermilion River		Provincial Waterbody Id #	Watershed	Region	District	Map Sheet	Latitude:	Longitude:
		4255.00	5LJE	Western	Dauphin	62004	51 11 28	99 50 23


  

BIOLOGY		Presence
BLACKNOSE DACE <i>Rhinichthys atratulus</i>		Common
BRASSY MINNOW <i>Hybognathus hankinsoni</i>		Unknown
BROOK STICKLEBACK <i>Culaea inconstans</i>		Common
BROOK TROUT <i>Salvelinus fontinalis</i>		Unknown
BROWN TROUT <i>Salmo trutta</i>		Unknown
BURBOT <i>Lota lota</i>		Unknown
CARP <i>Cyprinus carpio</i>		Unknown
COMMON SHINER <i>Notropis cornutus</i>		Common
CREEK CHUB <i>Semotilus atromaculatus</i>		Unknown
EMERALD SHINER <i>Notropis atherinoides</i>		Common
FATHEAD MINNOW <i>Pimephales promelas</i>		Common
JOHNNY DARTER <i>Etheostoma nigrum</i>		Unknown
LOGPERCH <i>Percina caprodes</i>		Unknown
LONGNOSE DACE <i>Rhinichthys cataractae</i>		Unknown
NORTHERN PIKE <i>Esox lucius</i>		Unknown
NORTHERN REDBELLY DACE <i>Chrosomus eos</i>		Unknown
PEARL DACE <i>Semotilus margarita</i>		Unknown
QUILLBACK <i>Cariodes cyprinus</i>		Unknown
RIVER DARTER <i>Percina shumardi</i>		Unknown
SHORTHEAD REDHORSE <i>Maxostoma</i>		Unknown
SILVER CHUB <i>Hybopsis storeriana</i>		Unknown
SMALLMOUTH BASS <i>Micropterus dolomieu</i>		Unknown
WALLEYE <i>Stizostedion vitreum</i>		Unknown
WHITE SUCKER <i>Catostomus commersoni</i>		Common
YELLOW PERCH <i>Perca flavescens</i>		Unknown

Creel		
Year	Species	Catch/Unit Effort*
*Catch/Unit Effort = Catch/Hour		

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<b>Waterbody: Vermilion River</b>		<b>Provincial Waterbody Id #</b> 7232.00	<b>Watershed</b> 6EBB	<b>Region</b> Northeastern	<b>District</b> Leaf	<b>Map Sheet</b> 64B12	<b>Latitude:</b> 56 37 2 <b>Longitude:</b> 99 42 33
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### Habitat Suitability

Seasonal Habitat Suitability\*

All	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	None
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

\*The month(s) the waterbody is useable for fish Habitat (without human intervention)

### Resource Access

Resource	Distance (km)

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### Habitat Classifications

Habitat Class	Class

### General Uses

General Use	Harvest Weight

---

### Needed Improvements

Year	Improvements	Comments

---

### BIOLOGY

Species	Presence
BROOK STICKLEBACK <i>Culaea inconstans</i>	Unknown
BURBOT <i>Lota lota</i>	Unknown
NORTHERN PIKE <i>Esox lucius</i>	Unknown

### Creel

Year	Species	Catch/Unit Effort*

\*Catch/Unit Effort = Catch/Hour

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Page 1 of 1

Waterbody: Wilson River		Watershed	Region	District	Map Sheet	Latitude:	Longitude:
Provincial Waterbody Id #	4256.00	5LJF	Western	Dauphin	62004	51 12 53	99 51 0


  

BIOLOGY		Presence
BLACKNOSE DACE <i>Rhinichthys atratulus</i>	Common	
BROOK STICKLEBACK <i>Culaea inconstans</i>	Common	
COMMON SHINER <i>Notropis cornutus</i>	Common	
CREEK CHUB <i>Semotilus atromaculatus</i>	Common	
FATHEAD MINNOW <i>Pimephales promelas</i>	Common	
FINESCALE DACE <i>Proximus neogaeus</i>	Uncommon	
GOLDEYE <i>Hiodon alosoides</i>	Uncommon	
JOHNNY DARTER <i>Etheostoma nigrum</i>	Common	
LOGPERCH <i>Percina caprodes</i>	Common	
LONGNOSE DACE <i>Rhinichthys cataractae</i>	Common	
NORTHERN PIKE <i>Esox lucius</i>	Common	
QUILLBACK <i>Carpiodes cyprinus</i>	Common	
RIVER DARTER <i>Percina shumardi</i>	Uncommon	
SHORTHEAD REDHORSE <i>Moxostoma</i>	Common	
SPOTTAIL SHINER <i>Notropis hudsonius</i>	Common	
TROUT PERCH <i>Percopsis omiscomaycus</i>	Common	
WALLEYE <i>Stizostedion vitreum</i>	Common	
WHITE SUCKER <i>Catostomus commersoni</i>	Common	

Creel		
Year	Species	Catch/Unit Effort*
*Catch/Unit Effort = Catch/Hour		

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## **Appendix D**

Water Rights Licence

MG-14854 (English)

**Licence to Use Water for  
Municipal  
Purposes**



Issued in accordance with the provisions of  
**The Water Rights Act** and regulations made thereunder.

Licence No.: **2010-107**  
(Original Lic. No.: 2005-124)  
U.T.M.: Zone 14 388321 E  
5684011 N

Know all men by these presents that in consideration of and subject to the provisos, conditions and restrictions hereinafter contained, the Minister of Water Stewardship for the Province of Manitoba does by these presents give full right and liberty, leave and licence to **G3 Regional Water Co-operative Inc.** of the **Rural Municipality of Gilbert Plains** in the Province of Manitoba (hereinafter called "the LICENSEE") to divert water from a **sand and gravel** aquifer by means of 2 water wells, pumps, pipeline(s) and other appurtenances (hereinafter called "the WORKS"), located on the following described lands:

**the municipal road allowance lying to the West of the Northwest Quarter of Section 35, in Township 26 and Range 23, West of the Principal Meridian in Manitoba,**

and more particularly shown on a plan filed in the office of the Executive Director, Regulatory and Operational Services Division, a copy of which plan is hereto attached and marked Exhibit "A" for **municipal** purposes on the following described lands:

**the Rural Municipality of Gilbert Plains, the Town of Gilbert Plains and the Town of Grandview.**

This licence is issued upon the express condition that it shall be subject to the provisions of The Water Rights Act and Regulations and all amendments thereto and, without limiting the generality of the aforesaid, to the following terms and conditions, namely:

1. The water shall be used solely for **municipal** purposes.
2. The WORKS shall be operated in accordance with the terms herein contained.
3. a) The maximum rate at which water may be diverted pursuant hereto shall not exceed **0.034 cubic metres per second (1.2 cubic feet per second)**.  
b) The total quantity of water diverted in any one year shall not exceed **315 cubic decametres (255.37 acre feet)**.
4. Water shall not be diverted during any period when the water level in the aquifer as measured at:
  - a) 2010 Well is more than 39.9 metres (141.0 feet) beneath the surface of the ground.
  - b) 2009 Well is more than 41.1 metres (135.0 feet) beneath the surface of the ground.
5. The LICENSEE does hereby remise, release and forever discharge Her Majesty the Queen in Right of the Province of Manitoba, of and from all manner of action, causes of action, claims and demands whatsoever which against Her Majesty the LICENSEE ever had, now has or may hereafter have, resulting from the use of water for **municipal** purposes.
6. In the event that the rights of others are infringed upon and/or damage to the property of others is sustained as a result of the operation or maintenance of the WORKS and the rights herein granted, the LICENSEE shall be solely responsible and shall save harmless and fully indemnify Her Majesty the Queen in Right of the Province of Manitoba, from and against any liability to which Her Majesty may become liable by virtue of the issue of this Licence and anything done pursuant hereto.
7. This Licence is not assignable or transferable by the LICENSEE and when no longer required by the LICENSEE this Licence shall be returned to the Executive Director, Regulatory and Operational Services Division, for cancellation on behalf of the Minister.
8. Upon the execution of this Licence the LICENSEE hereby grants the Minister or the Minister's agents the right of ingress and egress to and from the lands on which the WORKS are located for the purpose of inspection of the WORKS and the LICENSEE shall at all times comply with such directions and/or orders that may be given by the Minister or the Minister's agents in writing from time to time with regard to the operation and maintenance of the WORKS.
9. This Licence may be amended, suspended or cancelled by the Minister in accordance with The Water Rights Act by letter addressed to the LICENSEE at **Box 642, Gilbert Plains, MB, R0L 0X0, Canada** and thereafter this Licence shall be determined to be at an end.
10. Notwithstanding anything preceding in this Licence, the LICENSEE must have legal control, by ownership or by rental, lease, or other agreement, of the lands on which the WORKS shall be placed and the water shall be used.
11. This Licence shall expire on March 26, 2026 and this Licence shall become effective only on the date of execution hereof by a person so authorized in the Department of Water Stewardship. The LICENSEE may apply for renewal of this Licence not more than 365 days and not less than 90 days prior to the expiry date.
12. This Licence expires automatically upon the loss of the legal control of any of the lands on which the WORKS are located or on which water is used, unless the Licence is transferred or amended by the Minister upon application for Licence transfer or amendment.

13. The LICENSEE shall keep records of daily and annual water use and shall provide a copy of such records to the Executive Director, Regulatory and Operational Services Division, not later than February 1st of the following year.
14. A flow meter must be installed, positioned to accurately measure instantaneous pumping rate and accumulative withdrawals from the water source.
15. The LICENSEE does hereby agree to correct, to the satisfaction of the Minister, any water supply problems to wells or other forms of supply, which were constructed and operating prior to the date of application for the original Licence (No. 2005-124), and which are partly or wholly attributable, in the opinion of the Minister, to the diversion of water as authorized by this Licence.
16. The LICENSEE shall hold and maintain all other regulatory approvals that may be required and shall comply with all other regulatory requirements for the construction, operation, or maintenance of the WORKS or to divert or use water as provided by this Licence.

In witness whereof I the undersigned hereby agree to accept the aforesaid Licence on the terms and conditions set forth therein and hereby set my hand and seal this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20 \_\_\_\_ .

SIGNED, SEALED AND DELIVERED  
in the presence of

\_\_\_\_\_ } \_\_\_\_\_ (Seal)  
Witness Licensee

Canada, PROVINCE OF MANITOBA To Wit:

I, \_\_\_\_\_ of the \_\_\_\_\_  
of \_\_\_\_\_ in the Province of Manitoba, MAKE OATH AND SAY:

1. That I was personally present and did see \_\_\_\_\_,  
the within named party, execute the within Instrument.
2. That I know the said \_\_\_\_\_  
and am satisfied that he/she is of the full age of eighteen years.
3. That the said Instrument was executed at \_\_\_\_\_  
aforesaid and that I am subscribing witness thereto.

SWORN BEFORE me at the \_\_\_\_\_  
in the Province of Manitoba this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20 \_\_\_\_ .

\_\_\_\_\_ } \_\_\_\_\_  
A COMMISSIONER FOR OATHS Witness  
in and for the Province of Manitoba

My Commission expires \_\_\_\_\_

Issued at the City of Winnipeg, in the Province of Manitoba, this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20 \_\_\_\_ .

\_\_\_\_\_  
The Honourable the Minister of Water Stewardship



## **Appendix E**

### MWSB Guidelines for Watercourse Crossings

# WATERCOURSE CROSSINGS

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## *Mitigation Measure*

1. All watercourse crossings will be directionally drilled.
2. A minimum undisturbed buffer zone of 15 metre will be maintained between directional drill entry/exit areas and banks of watercourse.
3. Heavy equipment (caterpillars, tractors) shall not be allowed within the buffer zone.
4. Enforce measures regarding fuelling or servicing equipment within 100 metre of watercourse.
5. Waste drill mud and cuttings will be prevented from entering surface water.
6. Should erosion control measures be implemented, post construction monitoring shall be conducted to ensure effectiveness.
7. Further erosion control measures will be implemented as necessary.

## **Reclamation**

1. Restore all disturbed areas to original contours.
2. Install erosion control measures, if warranted, and maintain until vegetation becomes established.

## **Pressure Loss/Fluid Loss Response**

To avoid or minimize the potential for drilling fluids and drill cuttings from entering watercourses because of a frac-out, the following monitoring and response plan will be followed:

1. A record of drilling progress will be maintained to always know the location of the drill head relative to the point of entry.
2. A record of drilling component usage (type and quantity) will be maintained throughout each drilling operation.
3. A record of drilling fluid volume used and returned will be maintained to detect any significant fluid losses. Drilling fluid pump pressure will be continuously monitored. Abnormal loss of returned fluids or loss of fluid pressure that may be indicative of a frac-out will be reported immediately to MWSB/PFRA construction field supervisor.
4. At watercourse crossings where water clarity permits, a view of the stream bottom, an observer will continuously check for signs of mud escapement to the watercourse.

## **Loss of Fluid and Frac-out Response Plan**

1. If an abnormal loss of fluid, drop in pressure or visible plume is observed indicating a frac-out or possible frac-out, drilling is to stop immediately.

2. The contractor will notify the MWSB/PFRA construction field supervisor of the frac-out condition or potential condition and decide on the appropriate action as follows:
  - a) Assign a person to visually monitor for the presence of muddy plume.
  - b) Make adjustments to the mud mixture; add lost circulation material (LCM) to the drilling fluid in an attempt to prevent further loss of fluid to the ground formation and/or watercourse.
  - c) Where conditions warrant and permit (i.e., shallow depth, clear water, low water velocity, potentially sensitive habitat) and where a frac-out has been visually detected, attempt to isolate the fluid release using a large diameter short piece of culvert.
  - d) Under circumstances where a frac-out has occurred, and where conditions do not permit containment and the prevention of drilling fluids release to the watercourse, attempts to plug the fracture by pumping LCM are not to continue for more than 10 minutes of pumping time.
  - e) If the frac-out is not contained within this time, MWSB/PFRA construction supervisor will halt any further attempts until a course of action (either abandon directional drilling or further consultation with MWSB engineers) is decided upon.