MONARCH HUTTERITE COLONY

NEW GROUNDWATER WELL AND RAW WATER PIPELINE SYSTEM

ENVIRONMENT ACT PROPOSAL

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MONARCH HUTTERITE COLONY

FINAL

PROJECT NO.: WSP REF. NO. 221-10243-00
DATE: MARCH 08, 2023

Submitted to:
Directors' Office
Environmental Approvals Branch
Manitoba Environment and Climate
14 Fultz Blvd.
Winnipeg, MB
R3Y 1A0

Submitted on Behalf of:
Mr. Richard Hofer
Monarch Colony
Box 226
Foxwarren, MB
R0J 0R0

Submitted By:
WSP Canada Inc.
1600 Buffalo Place
Winnipeg Manitoba R3T 6B8
T: 204-477-6650
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March 08, 2023

FINAL

Directors' Office
Environmental Approvals Branch
Manitoba Environment and Climate
14 Fultz Blvd.
Winnipeg, MB
R3Y 1A0
PH: (204)-945-8321

Attention: EAP Director

Dear EAP Director,

Subject: Environmental Act Proposal for New Groundwater Well and Raw Water Pipeline System - Monarch Hutterite Colony

WSP Canada Inc. (WSP) has been retained by the Monarch Hutterite Colony to submit an Environment Act Proposal (EAP) on their behalf for the development of a new groundwater well and raw water pipeline system for their colony near Birtle, Manitoba. As per the *Classes of Development Regulation* under *The Environment Act*, we understand that this project would be considered a Class 2 Development.

The objective of this EAP is to provide documentation in support of the attainment of an Environment Act License (EAL) for this project.

For your consideration, please find enclosed an electronic copy (as a searchable .pdf file on a removable drive) of the EAP package (including the application form) as well as the application fee of $7,500.00 as required for an EAP submission for a Class 2 Development.

If you have any questions or concerns about this submission, please contact the undersigned at your convenience.

Yours sincerely,

[redacted]

Danette Sahulka, M.Sc., P.Ag.
Lead Ecologist, Earth and Environment

AR/ds
Encl.
WSP REF. NO. 221-10243-00

SIGNATURES

PREPARED BY

[redacted]

Alyssa Reimer, B.Env.St. B.I.T.
Biologist

Date

APPROVED[1] BY

[redacted]

Danette Sahulka, M.Sc., P.Ag.
Lead Ecologist

Date

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STANDARD LIMITATIONS OF LIABILITY

WSP Canada Inc., ("WSP") prepared this report solely for the use of the intended recipient, MONARCH HUTTERITE COLONY, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The intended recipient is solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

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In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the sampling locations will depend on natural conditions, the history of Site development and changes through construction and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.]

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This limitations statement is considered an integral part of this report.

CONTRIBUTORS

CLIENT

Client	Monarch Hutterite Colony

WSP

Mike Matview	Project Manager
Report Preparation/Field Visit	Alyssa Reimer, Biologist, Earth and Environment
Report Technical Review QA/QC	Danette Sahulka, Lead Ecologist, Earth and Environment

Environment Act Proposal Form

Name of the development:
NEW GROUNDWATER WELL AND RAW WATER PIPELINE SYSTEM

Type of development per Classes of Development Regulation (Manitoba Regulation 164/88):
Class 2

Legal name of the applicant:
Richard Hofer

Mailing address of the applicant: Box 226

Contact Person: Richard Hofer

City: Foxwarren Province: Manitoba Postal Code: R0J 0R0

Phone Number: (204) 930-5478 Fax: email: jvcrichards@gmail.com

Location of the development: Birtle Manitoba

Contact Person: Richard Hofer

Street Address: Box 226

Legal Description: NW 36-17-27 WPM

City/Town: Foxwarren Province: Manitoba Postal Code: R0J 0R0

Phone Number: (204) 930-5478 Fax: email: jvcrichards@gmail.com

Name of proponent contact person for purposes of the environmental assessment:
Danette Sahulka

Phone: (204) 259-1487
Fax:

Mailing address: 1600 Buffalo Place, Winnipeg, Manitoba, R3T 6B8

Email address: danette.sahulka@wsp.com

Webpage address:

Date: 2023-02-01

Signature of proponent, or corporate principal of corporate proponent:
[redacted]

Printed name:

PRINT RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Environment Act Proposal Form**
- ☑ **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information and number of copies)
- ☑ **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):

Class 1 Developments	$1,000
Class 2 Developments	$7,500
Class 3 Developments:	
Transportation and Transmission Lines	$10,000
Water Developments	$60,000
Energy and Mining	$120,000

Submit the complete EAP to:
Director
Environmental Approvals Branch
Manitoba Environment, Climate and Parks
1007 Century Street
Winnipeg, Manitoba R3H 0W4

For more information:
Email: EABDirector@gov.mb.ca
Phone: (204) 945-8321
Fax: (204) 945-5229
https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

Internal Use Only
$1,000.....C1 B-02
$7,500.....C2 B-02
$10,000....TT B-02
$60,000.....WD B-02
$120,000...EM B-02

EXECUTIVE SUMMARY

The Monarch Colony is located northwest of Birtle, Manitoba, and southeast of Foxwarren, Manitoba in the Municipality of Prairie View. This is a relatively new Colony located on NW 36-17-27 WPM with an established population of approximately 50 people but will continue to grow over the upcoming years. The Colony is also expecting to construct a dairy facility in the near future.

The Colony has its own water treatment plant and wells, but the water quality is poor, and a high-quality water source is required. The Colony retained the services of W.L. Gibbons & Associates Inc. to develop a well on Colony owned land in 17-16-27W, approximately 18 kilometres southwest of the Monarch Colony.

The Monarch Colony retained WSP Canada Inc. (WSP) to provide engineering services to complete the pre-design and detailed design, for well mechanization, and a raw water pipeline from the new well site to the Colony.

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1 INTRODUCTION AND BACKGROUND

1.1 PROJECT OVERVIEW

This Environment Act Proposal (EAP) is submitted to the Manitoba Environment, Climate and Parks (MECP), Environmental Approvals Branch (EAB), as required under *The Environment Act* for the purpose of obtaining a Class 2 Environment Act Licence (EAL) in support of the installation of a raw water pipeline and groundwater well near Birtle, Manitoba for the Monarch Hutterite Colony.

1.2 PROPONENT

The proponent for this project is the Monarch Hutterite Colony. The primary contact from the Colony for the project is:

Mr. Richard Hofer
Monarch Colony
Box 226
Foxwarren, MB
R0J 0R0

1.3 LOCATION

The Monarch Hutterite Colony is located near Birtle, Manitoba, and the Project extends from NE-17-16-27W1, off Provincial Road (PR) 568 at the southern end to NW-35-17-27WPM at the northern end. The Project encompasses land within the Rural Municipality (RM) of Prairie View. As construction of the new pipeline and wellsite are set to occur, a Project Study Area (PSA) was defined as depicted in **Figure 1** and in **Appendix A - Mapbook**.

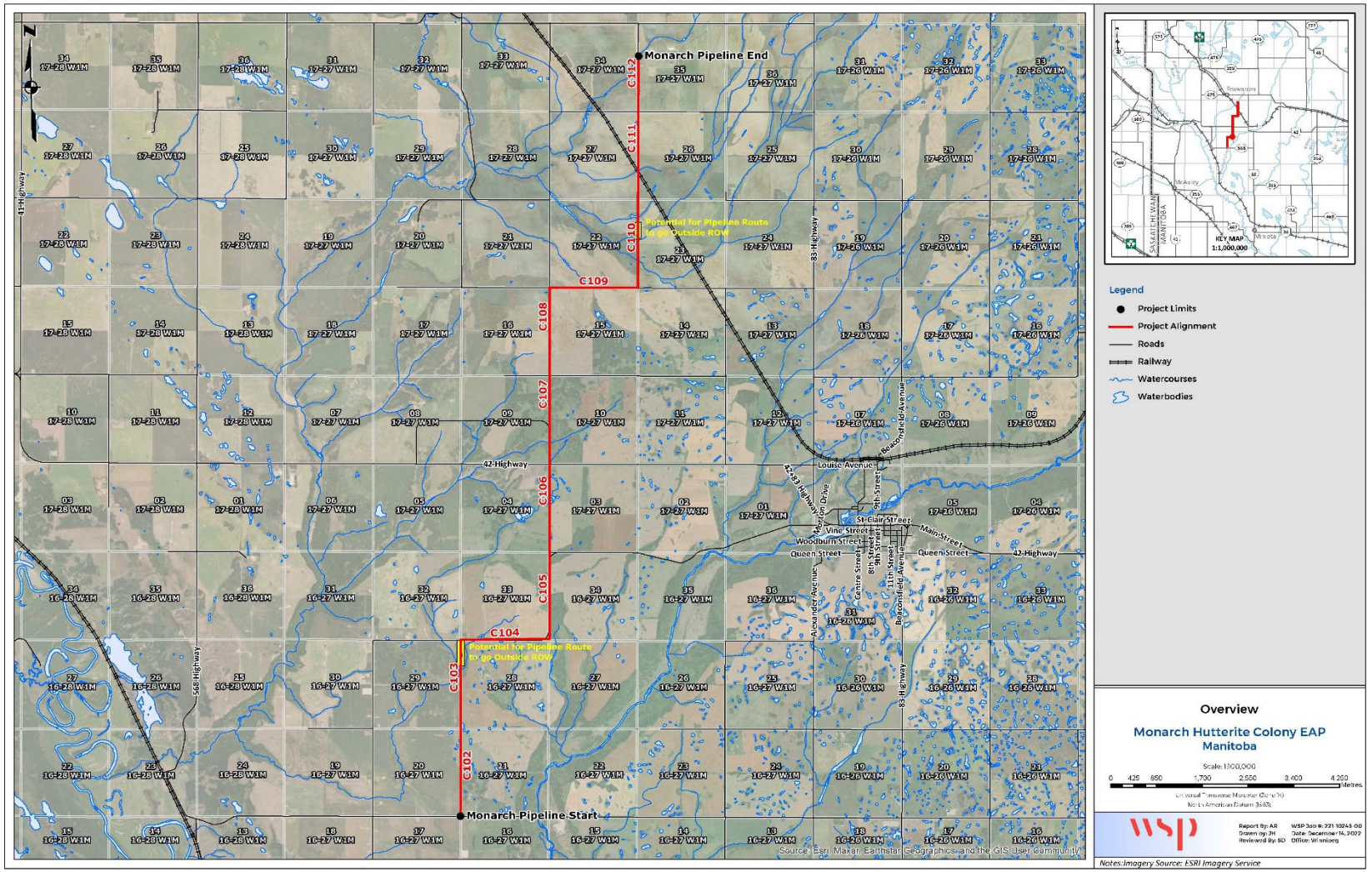

Figure 1 Overview of the Monarch Hutterite Colony Raw Water Pipeline Route

2 DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 PROJECT NEED, PURPOSE, AND ALTERNATIVES

The Monarch Hutterite Colony is planning to construct a new groundwater well and raw water supply line to serve their colony located in southwest Manitoba. The proposed new wellsite is to be located on NE-17-16-27W1, off PR 568 in the RM of Prairie View, southwest of Birtle, Manitoba. The raw water pipeline would extend from the new wellsite for approximately 17.5 kilometres (km) northwards, along existing road allowances to terminate at or near the existing water treatment plant at the Colony at NW-35-17-27WPM, northwest of Birtle, herein referred to as the "Project" (refer to **Appendix B** for drawings). Monarch Colony is a relatively new Colony with an established population of approximately 50 people but will continue to grow over the years. The Colony also desires to construct a dairy facility in the near future for which the new water well and pipeline may also service.

WSP contacted Mr. Bruce Webb with the EAB on October 21, 2022, and his response has indicated that the Project is considered a Class 2 Development under *The Environment Act* and would therefore require an EAL.

2.2 LAND OWNERSHIP

The Monarch Hutterite Colony has a caveat associated with the quarter section of land (NE-17-16-27W1) on which the new groundwater well will be developed. The land title associated with this property with the caveat and Agreement of Purchase and Sale of Land by Monarch Holding Co. Ltd. is provided in **Appendix C**.

2.3 SERVICING DEMANDS

During the pre-design meeting on September 26, 2022, the Colony confirmed that the water supply line and well mechanization are to be designed to accommodate a short-term flow of 4.5 L/sec (litres per second), which would meet their domestic and agricultural needs. It was further discussed that the Colony may expand their dairy operation in the future, and therefore the long-term flow requirement could be 7.5 L/sec. Proposed Colony growth and details on domestic water use, and future details on dairy operations, were not provided, other than the aforementioned total potable water demands.

It was agreed that due to the length of the water supply line, and the significant cost to upgrade or twin the pipeline in the future, it would be prudent to size the initial line to accommodate the long-term flow of 7.5 L/sec. The one production well (TW 22-01) that has been completed by W.L. Gibbons, is reported to be able to provide a flow of 10.5 L/sec, which exceeds the long-term goal of the Colony. A second well could also be developed in the future, but there does not appear to be a need for a second well at this time, other than to provide redundancy for dependability. Options will be provided for well pumps that could accommodate flow for short-term and long-term needs.

2.4 WATER LINE

2.4.1 WATER LINE ROUTING

The route of the proposed raw water line was discussed at the pre-design meeting, and the Colony's preference was to install the water supply line on the right-of-way of existing municipal roads, as opposed to private lands that would require easements from landowners. The proposed raw water line would generally be located in the existing ditches between the road and the right-of-way limit. This would allow access to accommodate maintenance issues or repairs. The preferred route is to be the most direct as possible and would also minimize the number of crossings of highways, drains, and railway tracks. Based on the foregoing, the selected route by the Colony would commence at the well site in 17-16-27W and proceed two miles north along the east side of Road 160W, one mile east along the south side of Road 95N, four miles north along the east side of Road 159W, one mile east along the south side of Road 99N, 2.5 miles north along the east side of Road 158W, and then northeast across NW 35-17-27 to the existing water treatment plant at the Monarch Colony. There is an approximately 30 m long section of existing 100-millimetre (mm) High Density Polyethylene (HDPE) dimension ratio (DR) 9 water pipe into the water treatment plant. The proposed raw water line will connect to the end of the existing pipe, and no additional connection into the water treatment plant is required.

Although the existing municipal roads are generally centred on the existing right-of-way along the selected route, there are two locations where the road deviates from the right-of-way. This occurs on Road 160W, south of Road 95N, and on Road 158N, south of the CP Rail crossing. At these locations, the raw water line will be installed on the existing right-of-way, but the offset of the water line from the road will vary. A Conceptual Layout of the proposed water line is included in **Appendix B**.

2.4.2 WATER LINE SIZING

In order to size the proposed raw water supply system to meet the parameters described earlier in **Section 2.3**, a computer model of the system was utilized. The network model for this project was constructed using WaterGemsV.8i, developed by Bentley. This software solves hydraulic networks in a graphical environment. Using demand data and system inventory (i.e. pumps, pipes, etc.), a computerized schematic has been created for the main components of the supply line. Nodes were assigned elevations using information obtained from topographic information, and inserted into the model to simulate the piping, and analysis has been performed to simulate real-world operating conditions.

Based on the given peak flow demand and pipe lengths, the system was modelled to determine flow, frictional headloss, and static headloss/gain relationships. The modelling focused on meeting demands at the Colony and significant hydraulic locations (high and low points) on the pipeline. Scenarios were developed to ensure adequate flows are available to meet the demands for future growth, using various pipeline sizes. The system is analyzed for peak hour operating conditions, and assuming the pump at the well site can maintain a pressure of 695 kPa (Kilopascal) leaving the well, under those conditions. The raw water line between the well site and the Colony is designed such there will be a minimum residual pressure of 70 kPa in the system, and at the connection at the Colony, during the long-term peak hour demand of 7.5 L/sec.

2.4.3 PIPE SPECIFICATIONS

Manitoba Water Services Board (MWSB) specifications and approved material listings will be applied to this project. All water lines shall meet the MWSB Specification Section 02706 – 2.01 PIPE. HDPE DR 17 pipe is recommended, which has an operating pressure rating of 690 kPa. An exception is the first 800 metres (m) of pipe from the well site and proceeding north. As this section of pipe will be experiencing long-term operating pressures close to the design limits of DR 17 pipe, a thicker walled DR pipe is recommended. If any other isolated sections of pipe in low-lying areas along the pipeline route experience similar high pressures, as will be determined during the detailed design phase, a thicker walled DR will also be identified for these locations. HDPE pipe joints shall be thermal butt fusion type, or electrofusion, with flanges for connection to appurtenances.

2.4.4 WATER LINE INSTALLATION

As the entire route of the raw water supply line is in a rural setting, contractors will be given the option to install by either open cut excavation, directional drilling, or by ploughing. The latter method would likely provide the most competitive pricing, however, installation by ploughing is generally suited to a pipe size of 150 mm or smaller. The crossing of major drains, municipal roads, Provincial Highways, railways, and high-pressure gas lines will require special consideration and installation by trenchless methods, such as directional drilling. These will be addressed during the detailed design phase. Air release appurtenances, flushouts, and encasement pipes will be required at selected locations.

2.5 WELL SITE

Well mechanization will be based upon the design of the new well as prepared by W L Gibbons and Associates. The pump will be all-stainless steel Grundfos or Goulds submersible pumps with appropriate flow and head characteristics for compatibility with delivering the design target (4.5 L/sec short term or 7.5 L/sec long term), and head (discharge pressure) to overcome well water level drawdown at that pumping rate, as well as hydraulic friction losses in the drop pipe, raw water pipeline and various appurtenances integrated into the raw water conveyance system. All-stainless steel pitless adaptors and stainless-steel drop pipes will be specified for pump installation in the new wells. The discharge piping from the pitless unit will be connected with piping to the proposed raw water pipeline (with appropriate valves to allow isolation of each well). From the Hydrogeological Assessment, the static level of the water in the well is 31.5 m below ground. During the drawdown testing of the pump, the water level dropped to 33.5 m below ground. A 100 mm diameter pump would be required for the short-term flow of 4.5 L/sec, and a 150 mm diameter pump would be required for the long-term flow of 7.5 L/sec. Pumps will be installed in a 200 mm casing. Monarch Colony has confirmed their preference to install the 150mm pump initially, rather than change it out in the near future.

The electrical and controls for the well mechanization will include collaboration with Hydro to confirm the adequacy of their existing nearest service. Depending upon what Hydro infrastructure exists on site, Hydro will be asked to provide a transformer and service drop. A new Customer Service Termination Enclosure (CSTE) will be provided for the Hydro service drop. The new weatherproof duplex pump control panel will be designed to provide power distribution to the well pumps with appropriate VFD (variable frequency drive) controls. Overload protection will be provided for all circuits. The panel will be sized to be compatible with the initial pump selection, and also to accommodate a future pump and well.

Cable conductor sizing between the panel and wells will be compatible with those longer-term objectives. The well pump control system will consist of a pressure switch-type system, as per the Colony's preference. A gravel access road will be provided from Road 160W to the well. The Colony has expressed an interest to construct a building around the well and control panel in the future, but it is not part of the present scope of work. It should be noted that Manitoba Transportation and Infrastructure (MTI) maintains a 38 m control zone adjacent to their Provincial Highways. The well is located in close proximity to PR 568, and therefore permission from MTI may be required if a future building is to be constructed for the well.

2.5.1 WELL CAPACITY

The pumping of well TW 22-01 at 10.5 L/s resulted in a drawdown in that well of approximately 1.4 m. The indicated specific capacity of the well is 7.5 L/s/m of drawdown. At the design 4.5 L/s, the drawdown would be 0.6 m and approximately 14.6 m of residual drawdown above the top of the screen would remain and would be available to accommodate seasonal/long-term natural fluctuations in groundwater levels, and the typical loss of well capacity over time as iron/manganese precipitates accumulate in the screen. There are no concerns about the potential for the aquifer to sustain the proposed withdrawal of up to 4.5 L/s for the Monarch Colony water supply system, in conjunction with the existing design pumping rate of 12 L/s for the Birtle water supply system (See Hydraulics Report in **Appendix F**).

2.5.2 WELL DESIGN

Refer to **Appendix B** for the well design drawings.

2.6 DESIGN CONSIDERATIONS

The following items shall be incorporated and addressed as needed:

- Gate valves and manual air releases (maximum spacing – three km)
- Flushouts (at low points, with a maximum spacing of 6.5 km)
- Additional valves at tees and crosses
- Automatic air releases at major elevation changes
- Manual air releases at minor elevation changes
- Creek crossings to have topographic surveys to determine special requirements
- P.T.H., PR., and railway crossings to have encasement pipes
- The pipelines will be designed for working pressures up to 525 kPa.

2.7 PROJECT SCHEDULE

An overview of the anticipated Project schedule is provided in **Table 1**.

- Project start date: September 2022 (project design initiation meeting)
- Project completion: December 2023

Table 1 Summary of Anticipated Project Timeline

PROJECT ACTIVITY	START DATE	COMPLETION DATE
Project Design (well and water line)	September 2022	June 2023
Approvals - Manitoba Transportation and Infrastructure (water pipeline installation along of across provincial ROWs) - RM of Prairie View (water pipe lay down in ROWs) - CP rail crossing approval - Provincial approval for crossing of Provincial Waterways (drains) - Manitoba Office of Drinking Water (construct and operate well/water pipeline) Manitoba Environment Climate and Parks (crossing of Provincial Drains)	January 2023	May 2023
Environment Act License - Development & submission of EAP - EAB approval process & granting of EAL	December 2022	May 2023
Project Construction - Well installation - Water pipeline installation	June 2023	October 2023
Project Wrap-up	November 2023	December 2023

3 EXISTING ENVIRONMENT

3.1 EXISTING LAND USE

The existing land use of the PSA includes rural agricultural in the form of annual crop and cattle pastureland, with open grassland, deciduous treed areas, and riparian areas along drains (refer to Land Use Map in **Appendix D**).

There is one Canadian Pacific (CP) rail line that crosses the PSA (water pipeline will need to cross under the rail line at SE-27-1727W1 / SW-26-17-27W1; see **Appendix D**).

Several of the quarter sections of land to the south of the south and west of the proposed groundwater well site on NE-17-16-27W1 also contain oil/gas production well pad sites.

3.1.1 SPECIAL RESOURCE USE AREAS

According to a review of the Manitoba Mines Branch - Integrated Mining and Quarrying System (iMaQs) website (Manitoba Mines Branch, n.d.), quarry and mining maps viewers, there are currently no existing or planned quarries within the PSA (refer to **Appendix D**).

3.2 BIOPHYSICAL ENVIRONMENT

3.2.1 ECOLOGICAL CLASSIFICATION

The Project site is located within the Aspen Parkland ecoregion of the broader Prairies Ecozone.

3.2.2 CLIMATE

The Aspen Parkland ecoregion has a mean annual air temperature ranging from 1.2°C to 2.8°C. The average growing season ranges from 173 days in the northern section to 183 days in the southwest. The average annual precipitation ranges from about 440 to 530mm and varies greatly each year. In Manitoba, average yearly moisture deficits range from less than 140 mm in the north to about 300 mm in the southwest. The soils in the area may not be well drained and may remain saturated for prolonged periods after snowmelt. However, during the growing season, they are usually only saturated for short periods after heavy precipitation. This ecoregion has a subhumid, cool to moderately cool Boreal soil climate (Smith, et al., 1998). Much of the vegetation in the ecoregion has been strongly modified by agricultural practices, and native vegetation in the Project site is limited to a riparian zone along drains, and pockets of mixed deciduous forest that have been heavily impacted by cattle grazing.

3.2.3 AIR QUALITY AND NOISE

Air quality is expected to be good due to the rural location with less traffic and industrial pollution. There may be some existing noise due to highways, roads, and farming equipment.

3.2.4 SOILS AND TERRAIN

The general soil group for the PSA is the Chernozemic Group (sand parent material and loam) which is classified with soils that have been developed on Mesozoic shale (Manitoba Soil Survey, 1956).

According to the Manitoba AgriMaps online viewer, the soils associated with the site for the proposed groundwater well (NE-17-16-27W1) consists of three soil series - Jaymar (50%), Newdale (40%) and Vodroff (10%).

- The Jaymar soil series consists of well drained, Orthic Black soils occur on very gently to gently sloping topography. Runoff is moderate with moderate to rapid permeability in the upper loam/sandy layers and moderately slow in the underlying till. These soils may be stony (Manitoba Agriculture, Food and Rural Initiatives [MAFI]. 2010).
- Newdale soils consist of Orthic Black soils that are moderately well to well drained. These soils occur on mid to upper slopes of undulating to hummocky landscapes. They exhibit moderate to moderately rapid surface runoff and permeability is moderately slow (MAFRI, 2010).
- The Vodroff series consists of poorly drained Rego Humic Gleysols and have standing water at or near the surface for much of the year. They are found in areas level to depressional topography and runoff is negligible. Salinity can be a factor in areas where inflowing waters contain appreciable soluble salts (MAFRI, 2010).

The pipeline will be routed primarily through exiting municipal roadway rights-of-way (ROW) that have previously disturbed soils from roadway construction (grading and drainage design).

3.2.5 SURFICIAL AND BEDROCK GEOLOGY

The surficial geology for the PSA consists primarily of till sediments of calcareous clay. These deposits can range from one to 75 m in thickness, deposited from hummocky to streamlined subglacial. In addition to till sediments, there are some thin veneers of glacioflucial sediments which are less than one metre thick (Matile, 2004).

The bedrock geology for the Project consists of the Upper Cretaceous period Pierre formations. These formations are from the Mesozoic era of the larger Phanerozoic eon and are units within the Western Canada Sedimentary Basin. The Pierre formation consists of hard grey siliceous shale. (Manitoba Energy and Mines, 1990).

3.2.6 GROUNDWATER

A sand and gravel aquifer map for southern Manitoba indicates that there is a range from major buried sand and gravel aquifers to lenses of sand and gravel aquifers in the PSA. These occur in till and other surficial deposits more or less continuously over the area. The size of these aquifers can vary from less than a hectare to covering the whole area and vary by depth from a few metres to more than 100 m (Rutulis, 1986). The regional groundwater flow direction for the PSA is anticipated to be westward towards the Assiniboine River Valley (Smith, et al., 1998).

A search of the Manitoba Conservation and Climate (MCC) GWDrill 2018 well log database for the Project area's boundary (Rge 27W, Twp 11-20) identified a total of five registered groundwater wells within 250 m of the Project area boundary. The majority of the registered wells are production wells scattered across the Project area (refer to groundwater logs in **Appendix D**).

Groundwater quality was found to be poor in the area surrounding the Colony. In 2017, in response to the need to address long-term issues with the former Town of Birtle water supply, an investigation was undertaken in the Wattsview area that led to the establishment of a new groundwater supply for the town in NE17-16-27W. The results of these additional investigations confirmed the presence of a significant high transmissivity aquifer capable of sustaining substantial withdrawals of good quality groundwater.

3.2.7 VEGETATION AND WILDLIFE

The vegetation of the Aspen Parkland Ecoregion has been modified from its original state due to significant cultivation and development (Smith et al., 1998). Historically, the native vegetation would have consisted of grassland, river valleys, and aspen/shrub complexes. Dominant grasses may include fescues (*Festuca* sp.), wheat grasses (*Elymus* sp.), and Kentucky bluegrass (*Poa pratensis*). There are also poorly drained sites that may support slough grasses (*Beckmannia schizachne*), marsh reed grass (*Calamagrostis inexpansia var. stricta*), and shrubby willows (*Salix* sp.).

Currently, a majority of the PSA has had some level of anthropogenic disturbance from agricultural activities, service roads, and rural homes in the general area (refer to Land Use map in **Appendix D**). This has resulted in most of the vegetation within the PSA to be cultivated farmland, homogenous seeded road rights-of-way of grasses, and some planted shrubs and trees as landscaping that have formed along the Project. There are also several wetland/riparian areas dominated by cattails interspersed with the potential for some native species within the PSA that exist.

Wildlife within this ecoregion may include coyote (*Canis latrans*), red fox (*Vulpes vulpes*), striped skunk (*Mephitus mephitis*), and eastern cottontail (*Sylvilagus floridanus*). Wildlife has been affected by a decrease in grassland and wetland habitat through agricultural development within this region. There are many bird species that are found throughout this ecoregion, including raptors, waterfowl, and songbirds. Refer to **Appendix D** for a list of bird species recored for the area by the Manitoba Breeding Bird Atlas. There are also amphibians present, including garter snakes and various frogs (Smith et al., 1998).

The PSA was surveyed in December 2022 and though the landscape was snow covered, there appeared to be tame pasture along the ditches that may contain remnant prairie vegetation. There was also forested habitat consisting predominately of aspen (*Populus tremuloides)* and some oak (*Quercus macrocarpa*) throughout the PSA (refer to **Appendix E** for photos). A portion of the PSA was not surveyed due to snow covered roads. Wildlife species were recorded incidentally and are listed below in **Table 2**. Overall habitat was documented in photos, with the inability to identify vegetative species due to the timing of the survey (**Appendix E**)**.**

The Manitoba Conservation Data Centre (MB CDC) was contacted to provide any potential SOCC within two km of the Project (**Appendix D**). Refer to **Table 3** for these species.

Table 2 Incidental Species Observed During the Site Visit in December 2022

COMMON NAME	SCIENTIFIC NAME	NUMBER OBSERVED	OBSERVATION TYPE	SPECIES RANK[1]	ESEA[2]	SARA[3]	COSEWIC[4]
Common Raven	*Corvus corax*	1	Visual	S5	-	-	-
Game Trail	NA	1	Visual	NA	NA	NA	NA
Black-billed Magpie	*Pica hudsonia*	1	Visual	S4	-	-	-
Snow Bunting	*Plectrophenax nivalis*	20	Visual	S4N	-	-	-
Ungulate Trail	NA	1	Visual	NA	NA	NA	NA
White-tailed Deer	*Odocoileus virginianus*	6	Visual	S5	-	-	-

Notes:
[1]NatureServe (2022)
NA = Not Applicable
S2 = Imperiled
S3 = Vulnerable
S4 = Apparently Secure
S5 = Secure
[2] ESEA = Endangered Species and Ecosystems Act
[3] SARA = Species at Risk Act
[4] COSEWIC = Committee on the Status of Endangered Wildlife in Canada

Table 3 List of SOCC Provided by the MB CDC That Could Potentially Occur in the Project Area

COMMON NAME	SCIENTIFIC NAME	SPECIES RANK[1]	ESEA[2]	SARA[3]	COSEWIC[4]	FIRST OBSERVED	LAST OBSERVED
Baird's Sparrow	*Centronyx bairdii*	S1B	Endangered	Special Concern	Special Concern	1985-07-02	2013-06-11
Bank Swallow	*Riparia riparia*	S4B	-	Threatened	Threatened	2012-07-17	2012-07-17
Barn Swallow	*Hirundo rustica*	S4B	-	Threatened	Threatened	2013-07-10	2017-06-30
Bobolink	*Dolichonyx oryzivorus*	S3S4B	-	Threatened	Threatened	2014-07-02	2020-06-26
Chestnut-collared Longspur	*Calcarius ornatus*	S1S2B	Endangered	Threatened	Endangered	1990-04-25	2020-06-26
Creeper	*Strophitus undulatus*	S5	-	-	-	1938?	2013-08-06
Geyer's Spurge	*Euphorbia geyeri*	S2	-	-	-	1951-07-07	2011-08-24
Grasshopper Sparrow	*Ammodramus savannarum*	S2S3B	-	-	-	1988-05-31	2021-07-08
Horned Grebe	*Podiceps auritus*	S3B	-	Special Concern	Special Concern	2013-05-17	2013-06-04
Horned Lark	*Eremophila alpestris*	S3B	-	-	-	2020-06-25	2020-06-26
Mule or Black-tailed Deer	*Odocoileus hemionus*	S3	Threatened	-	-	1978-11-01	2022-01-12
Plains Rough Fescue	*Festuca hallii*	S3	-	-	-	1950-07-01	1950-07-01
Porter's Chess	*Bromus porteri*	S2S3	-	-	-	1995-07-04	1995-07-04
Prairie Loggerhead Shrike	*Lanius ludovicianus excubitorides*	S1B	Endangered	Threatened	Threatened	1987-07-22	1987-07-22
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	Threatened	Endangered	Endangered	2020-06-26	2020-06-26
Sprague's Pipit	*Anthus spragueii*	S2B	Threatened	Threatened	Threatened	2013-07-10	2013-07-10
Western Tiger Salamander	*Ambystoma mavortium*	S4S5	-	Special Concern	Special Concern	2017-08-01	2017-08-01
White Heelsplitter	*Lasmigona complanata*	S3	-	-	-	2021-08-12	2021-08-12
Yellow-banded Bumble Bee	*Bombus terricola*	S3S5	-	Special Concern	Special Concern	1923-05-30	1923-05-30

Notes:
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[2] ESEA = Endangered Species and Ecosystems Act
[3] SARA = Species at Risk Act
[4] COSEWIC = Committee on the Status of Endangered Wildlife in Canada

3.2.8 SURFACE WATER AND AQUATIC SPECIES

The PSA is located within the Assiniboine River Sub-District of the Assiniboine West Watershed District. The Assiniboine West district boundary spans 17,000 square kilometres (km²) and is divided into nine sub-districts; each boundary is delineated according to surface water catchment areas. This district is to the south of Riding Mountain National Park (Manitoba Escarpment) at an elevation of approximately 450 m (2,200 feet).

Watercourses within this district flow into the Assiniboine River, which in turn flows easterly towards Lake Manitoba and Lake Winnipeg (**Figure 3**). Key waterways within the subdistrict include the Bird Tail River, Snake Creek, Assiniboine River, and Qu-Appelle River (Assiniboine West Watershed District, 2022).

There are a few lakes within this region, with the larger lakes consisting of Clear Lake, Shoal Lake, and Lake of the Prairies. A large wildlife management area is located on Proven Lake, just south of Riding Mountain National Park (Assiniboine West Watershed District, 2021).

The raw water pipeline has the potential to cross several 1st order drains, one 2nd order drain and one 3rd drain (refer to **Figure 2**).

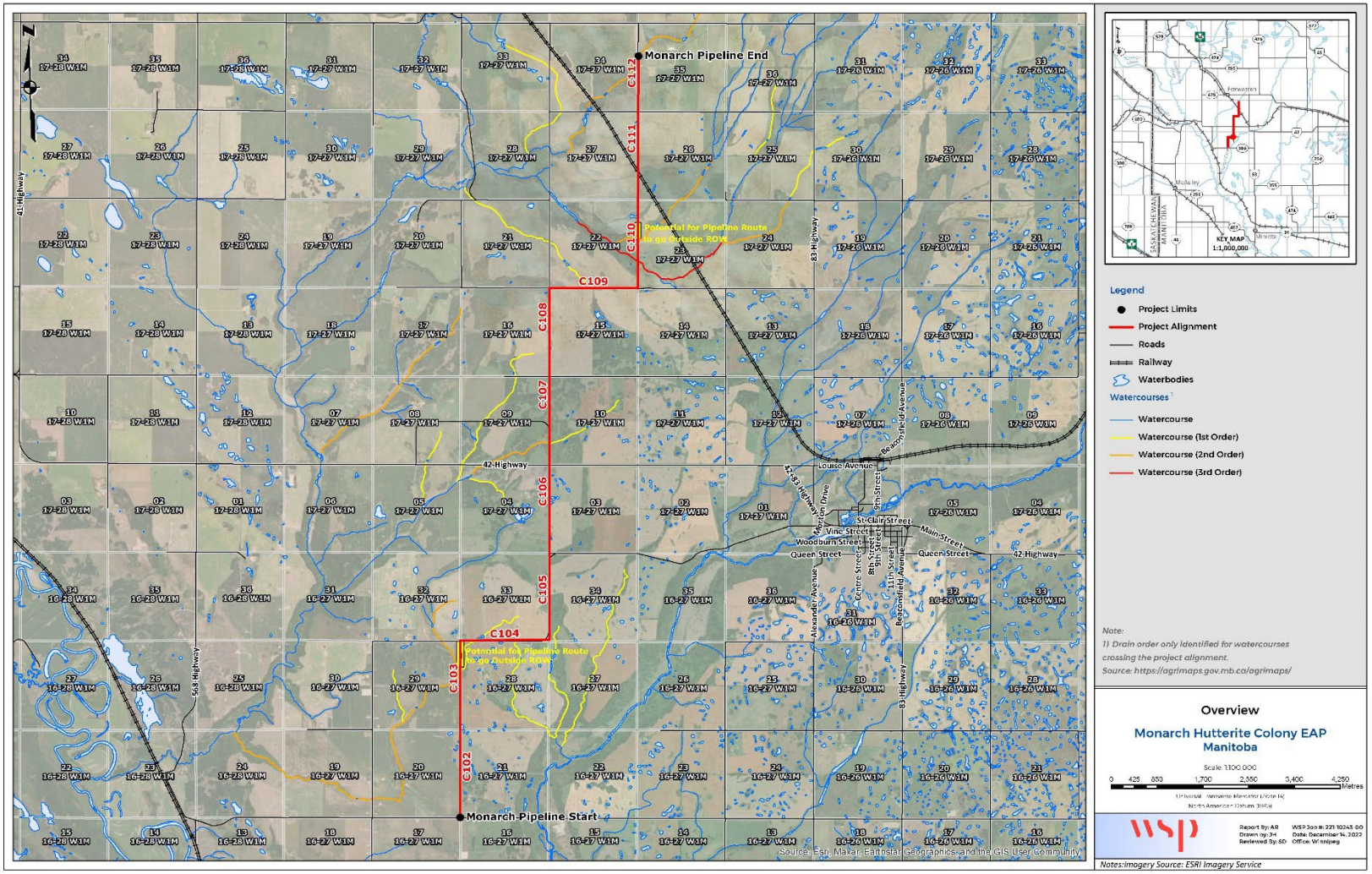

Figure 2 Map of the Drain Orders that the Pipeline Route Crosses

3.2.9 AQUATIC HABITAT

Within the Project, there are only unnamed tributaries to the Snake Creek. Some of these creeks have been sampled by Milani (2013) further upstream and may contain brook stickleback (*Culaea inconstans*) and fathead minnow (*Pimephales promelas*) (**Table 4)**.

An information request was sent to Laureen Janusz for the Snake Creek and the following species were identified as present within Snake Creek, blacknose dace (*Rhinichthys atratulus*), brook stickleback, central mudminnow (*Umbra limi*), creek chub (*Semotilus atromaculatus*), johnny darter (*Etheostoma nigrum*), northern pike (*Esox lucius*), walleye (*Sander vitreus*), and white sucker (*Catostomus commersoni*). These species have the potential to migrate up the drains within the Project if suitable water levels exist.

During the site visit, there were four locations that resembled class E drains, and photos can be found in **Appendix E**. Refer to **Figure 3** for the classification description used.

Table 4 Drain Classification Data for the Project Area from the Milani (2013) Report

DRAIN	CLASS	COMPLEX OR SIMPLE	NOTES
Unnamed Tributary to Snake Creek	E	Complex	-
Confluence of Unnamed Tributary and Snake Creek	E (C outside of Project area)	Complex	Brook stickleback and fathead minnow *Local knowledge stated that the tributary is typically dry but was not in the year it was assessed by Milani (2013)
Unnamed Tributary to Snake Creek	E	Complex	Woody debris and vegetated

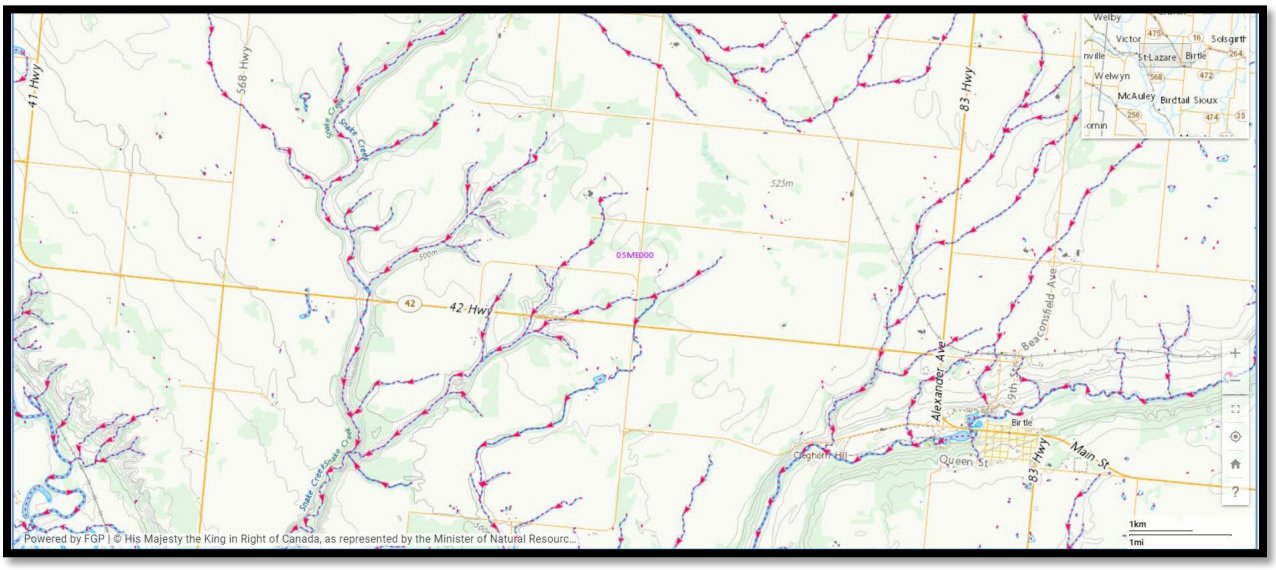

Figure 3 Hydrology of the Project and Surrounding Area[2]

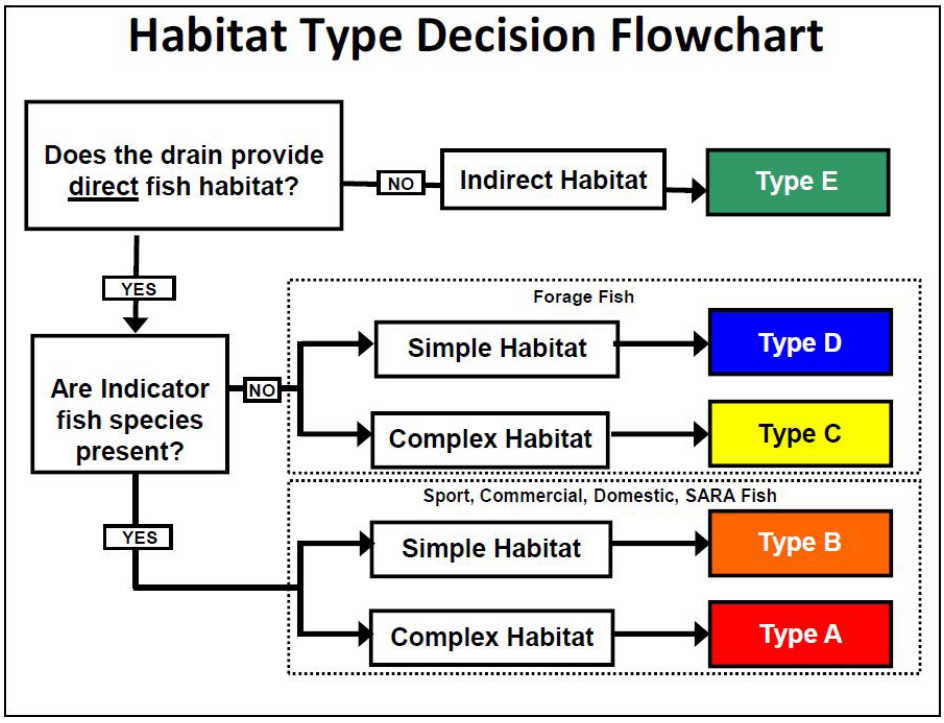

Figure 4 Flowchart Showing How Habitats are Classified from Milani (2013)

[2] Image taken directly from National Hydro Network: https://search.open.canada.ca/openmap/a4b190fe-e090-4e6d-881e-b87956c07977.

3.3 SOCIOECONOMIC ENVIRONMENT

3.3.1 EXISTING PUBLIC SAFETY AND HEALTH RISKS

There are potential public safety risks with the nearby rural homes near the Project. There are also roads that are used for daily travel within the Project. There are no anticipated health risks associated with the Project.

The water pipeline will also have to cross one railway line (refer to **Section 3.1**).

3.3.2 PARKS, OPEN SPACES, AND TRAILS

There are no parks, open spaces, or trails within the PSA.

3.3.3 HERITAGE RESOURCES

There are no anticipated heritage resources within the PSA. If any historic artifacts are found during construction, a qualified archaeologist may be required in support of the Project to determine if any heritage concerns are associated with the Project footprint and if further investigations are required.

3.3.4 INDIGENOUS AND METIS COMMUNITIES

The Project is located on Treaty 2 territory. There are no Indigenous or Metis communities located within or adjacent to the Project. The nearest Community being the Birdtail Sioux First Nation, located about eight km south of the Project (**Appendix D**).

According to a review of the Manitoba Mines Branch - Integrated Mining and Quarry System website (Manitoba Mines Branch, n.d.), quarry maps viewer, there are currently no Treaty Land Entitlement (TLE) claims within or adjacent to the Project. (**Figure 5**; **Appendix D**).

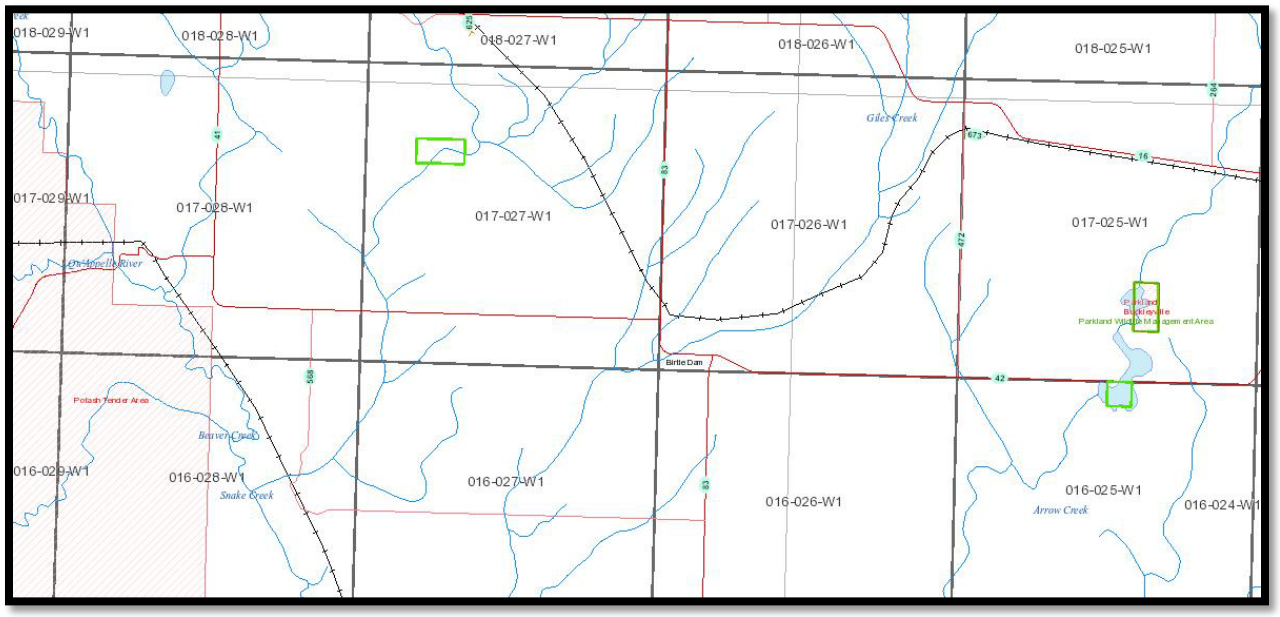

Figure 5 Quarry, Mining, and Indigenous Community Map for the Project area[3]

3.3.5 POPULATION AND ECONOMIC CHARACTERISTICS

Birtle Manitoba has a population of 625, while Prairie View Municipality has a population of approximately 2,167 (Prairie View Municipality, 2023 [a]).

There is oil drilling and production along the west side of the municipality. There are potash mines located nearby that are well into a 2.8-billion-dollar expansion project. There is also fertile farmland that supports farmers, with a predominately agriculture-based economy (Prairie View Municipality, 2023 [b]).

[3] Figure taken directly from: iMaQs Integrated Mining and Quarrying System available online at: https://web33.gov.mb.ca/imaqs/page/home.jsf#.

4 DESCRIPTION OF POTENTIAL ENVIRONMENTAL EFFECTS

4.1 AIR AND NOISE

It is anticipated that there may be some localized air quality effects from the Project including a short-term increase in greenhouse gas production from the use of construction equipment and increased dust production during the construction of the new pipeline alignment. Increased noise production may also be associated with the Project during construction through the use of heavy equipment. The effect is anticipated to be low, localized, and short-term over the duration of the construction activities.

4.2 SOILS

Effects to local soil resources is anticipated to be low to negligible as most of the project work will be occurring within existing, previously disturbed municipal road rights-of-way.

4.3 VEGETATION AND WILDLIFE

Effects to vegetation and wildlife within the PSA are anticipated to be low to negligible as most of the project work will be occurring with agricultural land / existing, previously disturbed municipal road rights-of-way.

The effects to vegetation and wildlife are expected to be localized and short-term over the duration of the construction activities. Revegetation of disturbed areas will occur as applicable, and wildlife will be able to utilize the area after construction is complete.

4.4 SURFACE WATER AND AQUATIC LIFE

It is anticipated that there is potential for some effects to surface water and aquatic life. There are several drains that occur within the PSA and the Project footprint may directly impact these drains. However, they are classified as drain orders 1 to 3 and as Class “E” fish habitat drains, as per Milani (2013) and appeared dry at the time of the site visit in December 2022. There are limited drains that have the potential to provide habitat for aquatic life within the Project, due to the low water levels observed. Milani (2013) reported two forage species found to be present in one of the drains, further upstream from the Project location. There is potential for minnow species to be found within the Project, under seasonal periods of higher water levels and flowing water within the drains.

4.5 LAND USE

It is anticipated that there will be minimal effects on the land use surrounding the Project. The majority of the land use surrounding, within, and adjacent to the Project is agricultural and residential in nature. The Project is expected to remain within the ROW and is unlikely to disturb the land surrounding it. If Project activities cannot stay within the ROW, they have the potential to affect some of the agricultural fields, as well as access to residential areas. The effect is anticipated to be localized, and short-term over the duration of the construction activities.

5 MITIGATION MEASURES

5.1 PROPOSED MITIGATION MEASURES

Proposed environmental management and risk mitigation practices to be employed to prevent or mitigate adverse implications from the impacts of the Project identified above can be found in **Table 5** below.

Table 5 Mitigation Measures That Have Been Developed for the Project Works

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
A. Biophysical Environment				
Atmosphere/Air Quality	**Issue 1** Decreased local air quality from: • Air emissions including greenhouse gases (GHGs) from construction equipment. • Increase in dust generation from vehicle and equipment movement, stripping and grading activities.	Mitigation to reduce negative air quality effects from construction of the Project may include, but not be limited to, the following: • Prevent dust generated during construction in designated work areas from blowing off-site by frequently watering paved or unpaved temporary roads and excavated areas or using other environmentally friendly dust suppressants for dust abatement. Sourcing of water for dust suppressant is under the Contractor's care. • Construction equipment operating on-site to be maintained in good working order to prevent excess emissions. • Construction equipment and vehicles will be compliant with applicable emissions control devices. • Implement best management practices (BMPs) that include "idle-free" zones or restrict vehicle idling time for construction delivery trucks, dump trucks and all other internal combustion powered equipment as appropriate.	Vehicle exhaust, odour, and dust emissions are anticipated to be typical of construction activities. Although these effects cannot be eliminated during construction, they can be reduced through adoption of construction BMPs. With the implementation of appropriate BMPs/mitigation measures, effects from construction activities on air quality, GHG emissions, and dust are expected to be minimal, localized, and temporary in nature.	Residual effects are expected to be low.
Noise and Vibration	**Issue 2** Increase in noise and vibration in the Project footprint due to the use of heavy equipment and construction activities: • Increase in noise and vibration may have a negative effect on human health (e.g., well-being) and wildlife (may leave the area; effect on breeding birds and amphibians by impeding ability to detect vocalizations).	Proposed mitigation measures to minimize or reduce noise effects from the Project work areas during construction include, but are not limited to, the following: • Proper signage to indicate construction activities occurring. • The Contractor will be restricted to work hours designated by the RM of Prairie View if applicable. • Regular inspection and maintenance of construction vehicles and equipment to be conducted to ensure engine components are in proper working order. • Stationary equipment, including compressors and generators, will be located away from sensitive noise receptors (i.e., residences, wildlife habitats) wherever possible. • The speed of the construction equipment will be kept to within the allowable speed limits on municipal and provincial roadways.	Noise and vibration effects are anticipated to be typical of road construction and although these effects cannot be eliminated during construction, they can be reduced through adoption of construction BMPs. With the implementation of appropriate mitigation measures, effects from construction activities on noise and vibration levels is expected to be minimal, localized, and temporary.	Residual effects are anticipated to be negligible.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
Groundwater	**Issue 3** Potential decrease in groundwater quality from: • Accidental release of deleterious substances to new groundwater well.	The new groundwater well will be installed as per requirements under the Manitoba *Water Rights Act* and as per the Water Rights License issued for the project (request for license has yet to be completed).	With the installation of the new well following applicable Licensing requirements, potential impacts to groundwater resources during installation and operation of the new well is expected to be negligible.	Residual effects are anticipated to be negligible.
Soils and Terrain	**Issue 4a** Permanent loss/alteration of soils from construction of the groundwater well and disturbance to soils for raw water pipeline installation.	Construction of the new groundwater well will have a small footprint on NE-17-16-27W1. Trenching of the pipeline is expected to occur primarily within existing, previously disturbed ROW. Mitigation measures to be implemented to address effects to soil and terrain include, but are not limited to, the following: • Limit surface disturbance to within designated and approved work areas. • Surface stability will be maintained by leaving non-construction areas vegetated and stabilizing or covering slopes of soil stockpiles. • Use appropriate equipment to minimize rutting of surface areas to avoid creating channels and flow pathways. • Disturbed areas will be revegetated as soon as practical to stabilize exposed areas; if final revegetation is not practical in the short-term, exposed should be vegetated with a suitable cover crop or erosion and sediment control blankets should be employed. • Monitor and maintain effective erosion and sedimentation control around drain crossings until revegetation is established. • If required, application of herbicides and pesticides will be in accordance with conditions and guidelines stipulated by the Province of Manitoba, and in accordance with product labels to ensure safe and proper use.	With the implementation of appropriate mitigation measures, the effect to soil resources and terrain during construction is expected to be minimal, restricted to the Project footprint and periodic to continuous.	Residual effects are anticipated to be low with implementation of mitigation measures.
	Issue 4b Exposure of previously contaminated soil during excavation activities: • Potential Environmental Health and Safety (EH&S) risks.	Any contaminated fill that is discovered will be treated in a manner in accordance with the applicable codes and regulations. Contaminated soil will be disposed of at a provincially approved land farm or landfill location.	Effects are anticipated to be localized, short-term in duration, and minimal.	Residual effects are anticipated to be low.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
	Issue 4c Erosion of soil surfaces and sedimentation of drainage pathways during construction activities.	The Contractor will be responsible to ensure that any works will minimize erosion and subsequent sedimentation for any drain and rail crossing, or highway locations. During construction polymer woven geotextile silt fences shall be used to minimize erosion and sedimentation. Photodegradable erosion control mats will be installed in the restored and improved ditches to minimize and control sedimentation. The time that trenches are open should be kept to a minimum.	Following appropriate mitigation measures for land drainage, potential effects are anticipated to be minimal, localized, and temporary in duration.	Residual effects are anticipated to be low.
	Issue 4d Potential contamination of soil resources from: • Fuel/chemical spills and leaks associated with handling and use of petroleum and allied products during construction activities.	Mitigation measures to minimize the impact on soil from petroleum and allied product handling and storage may include, but are not limited to, the following: • Compliance with Provincial and Federal Regulations: ➢ All petroleum handling and storage occurring on provincial land shall comply with Manitoba Regulation 188/2001 respecting "Storage and Handling of Petroleum Products and Allied Products". All petroleum handling and storage occurring on Federal land shall comply with “Storage Tank Systems for Petroleum Products”. ➢ Petroleum products shall be transported in accordance with the Manitoba Provincial *Dangerous Goods Handling and Transportation Act*. ➢ Tank vehicles used to deliver fuel to the worksite and/or used to move fuel around the worksite shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Preliminary Standard B620-98, “Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods". • Establishment of Designated Areas for Fuel Storage or Handling (including refuelling): ➢ All reasonable precautions shall be taken to ensure that refuelling only takes place within a Designated Area used for fuel storage or handling. ➢ Designated Areas shall provide spill containment and facilitate clean up through measures such as: maximum separation from environmentally sensitive features: clear identification of the materials present; access restricted to authorized vehicles and employees; impervious bermed storage areas; and dedicated spill response equipment. ➢ In the event that a piece of equipment must be refuelled outside a Designated Area, the fuel shall be transported in	Effects are anticipated to be localized, short-term in duration, and minimal.	Residual effects are anticipated to be low.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
		Approved containers and absorbent pads or other precautions, such as a high-density polyethylene (HDPE) groundsheet, shall be used to contain the fuel and prevent fuel from being spilled onto the ground surface. ➢ All reasonable precautions shall be taken to ensure that cleaning, washing, and servicing of equipment only takes place within a Designated Area. ➢ All mobile equipment that is not in use shall be parked within a Designated Area. ➢ All Designated Areas used for petroleum product storage shall be a minimum distance of: o 100 m from any water body and shall have the topsoil stripped and be underlain with at least 30 cm of impermeable soil or approved alternate and dyked in such a manner as to contain any leakage or spillage. The dykes shall be designed, constructed and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The topsoil shall be stored and used in the restoration of the site. o 3 m from a property line or building. o 15 m horizontally from hydroelectric poles and lines. ➢ Storage sites within Designated Areas for petroleum products shall be secured and signs including hazard warnings, who to contact in case of a spill, access restrictions and under whose authority the access is restricted shall be posted. Designated personnel and first responders shall be familiar with the storage location and proper application of such containment and cleanup materials. • Emergency Spill Response and Health and Safety CONTINUED: Spill Reporting ➢ In the event that there is a spill onto the ground surface from any piece of equipment, such as a broken hydraulic hose, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of off-site. Such events shall be reported to the Contract Administrator, Project Manager and to INAC.		

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
		The Contractor is to be responsible for the remediation of any spills. ➢ All major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety shall be reported to: ○ Manitoba Sustainable Development (MSD), immediately after occurrence of the environmental accident, by calling the 24-hour emergency number (204) 945-4888. ○ All spills shall be reported to INAC within 24 hours whether it was necessary to report the spill to MSD or not. The spill report shall include the following: personnel responding to the spill, material spilled, cause of spill, estimated amount of material spilled, estimated area and volume of soil affected by the spill. Cleanup action undertaken, means used to contain, transport and dispose of the materials involved. <u>Other</u> ➢ There shall be no smoking and no open flames at the petroleum storage area at any time. ➢ Waste oil shall never be used as a dust suppressant. ➢ Fuel barrels shall be securely fastened to the vehicle during transport and if possible during refuelling operations. All petroleum product storage sites and mobile transportation units shall, at all times, be equipped with appropriate categories of equipment and volumes of fire suppression products.		
Wildlife	**Issue 5** Impact to terrestrial wildlife habitat and wildlife species: • Temporary disturbance to habitat for wildlife species in Project footprint (e.g., ditches/ditch margins, drain crossings).	Although impact to wildlife and their habitat is anticipated to be low (project activities/footprint within agricultural land and exiting ROW), efforts will be taken to minimize disruption to the well-being of wildlife during construction by implementing the mitigation measures outlined below: • Construction and O&M activities will comply with all federal, provincial, and municipal legislation, regulations, guidelines, and BMPs.	With the implementation of appropriate mitigation measures effects to wildlife including amphibians and birds is expected to be negligible to minimal, localized and short-term during construction of the Project.	Residual effects are anticipated to be negligible for wildlife.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
	• Disturbance to breeding birds during clearing and grubbing activities.	• Construction personnel will not harass or harm wildlife. If wildlife nests, dens or young are found within the active construction area, or if problem wildlife are present, construction personnel will immediately inform the Contract Administrator for the Project who will take appropriate action by contacting the local Manitoba Sustainable Development Wildlife Branch for assistance. • Appropriate speed limits will be maintained by construction vehicles on established roadways to minimize vehicle-wildlife collisions. • Breeding Birds ➢ Prohibit vegetation clearing during the breeding bird window (mid April through late August) in order to comply with the *Migratory Birds Conventions Act.* ➢ If vegetation clearing occurs during the breeding bird season, a qualified avian biologist should be consulted to design and conduct a field survey, risk assessment, and mitigation plans (if required) for migratory birds in the Project footprint. ➢ All Designated Areas used for petroleum storage shall be a minimum distance of 100 m from any waterbodies. ➢ Construction activities will occur during daytime hours to minimize the effects of noise on amphibians and other wildlife. • Disturbance will be limited to the designated work areas only.		
Vegetation	**Issue 6** Disturbance to native vegetation adjacent to Project footprint.	Although impact to native vegetation is anticipated to be negligible to low (project activities/footprint within agricultural land and exiting ROW), the following mitigation measures are proposed to address potential Project effects on native vegetation adjacent to the Project footprint: • Construction and O&M activities and equipment should be restricted to the Project footprint and existing roadways where possible. • To minimize the spread of weeds and invasive species during and after construction of the water pipeline the following mitigation measures are recommended: ➢ During construction, weed control measures should be employed.	With the implementation of appropriate mitigation measures effects to vegetation resources during construction and operation is expected to be negligible to minimal and restricted to Project footprint.	Residual effects are anticipated to be negligible to low.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
		➢ Construction equipment travel and turn-around should be restricted to the Project footprint, marshalling areas, and access points. This will minimize disturbance to the soil that could provide new areas for invasive and weed species spread and minimize accidental collection and spread of weed seeds on construction equipment (e.g., vehicle tires). ➢ All equipment will be thoroughly washed and inspected prior to working in new sites to reduce the spread of introduced species. ➢ Use construction materials, such as gravel, from clean sources. Materials should be certified weed free prior to use. ➢ Effective post-construction weed control measures should be employed including: o Planting pedigree, weed-free grass/herbaceous seed for re-vegetation in disturbed areas to minimize the chance of introducing new weeds and invasive species. Native prairie species should be used for revegetation wherever possible. o Employing the use of effective weed control measures in previously disturbed areas by using a combination of cultural control methods including application of herbicides and mowing.		
Construction Wastes	**Issue 7** Disposal of construction wastes: • Potential contamination of soil, surface water, and groundwater resources.	The following mitigation measures are proposed for disposal of construction wastes: • All hazardous waste and fuel contaminated waste will be dealt with as required by applicable codes and regulations. • All non-hazardous waste will be disposed of in an approved landfill location. <u>General Site Housekeeping:</u> • All construction areas shall be kept clean and orderly at all times during and at completion of construction. • Waste material shall be recycled to a degree that is economically and practically feasible. • There shall be no indiscriminate dumping of waste and litter on or off the construction site.	With the implementation of appropriate mitigation measures, potential impact to soil and groundwater from construction wastes are anticipated to be minimal, localized, and temporary in duration over the construction period.	Residual effects are expected to be low.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
		• All waste materials shall be collected and contained in a designated waste storage area and in containers appropriate to the waste classification until removed from the site for recycling or disposal. • Contaminated runoff or water shall be contained and prevented from entering any watercourse. The collected contaminated runoff or water shall be hauled off site for disposal at an approved disposal facility.		
Dangerous Goods/ Hazardous Waste	**Issue 8:** Handling and disposal of dangerous goods/ hazardous waste • Potential contamination of soil, surface water and groundwater resources. • EH&S risks.	Handling and disposal of dangerous goods and hazardous waste will be conducted as follows: • Dangerous goods/hazardous wastes shall be identified and shall be handled in accordance with *The Dangerous Goods Handling and Transportation Act* and Regulations and Health Canada's WHMIS. • The Contractor shall have staff, trained, and certified in the handling of dangerous goods, present on-site whenever said dangerous goods are being utilized for the performance of the work. • All dangerous goods/hazardous waste shall be confined to Designated Areas and stored in a secure manner to prevent access by non-designated employees • Designated dangerous goods/hazardous waste storage areas shall have the topsoil stripped and be lined with at least 30 cm of impermeable material or approved equal and diked in such a manner as to contain any leakage or spillage. The dykes shall be designed, constructed, and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The topsoil shall be stored and used in the restoration of the site. • Disposal of hazardous waste shall only be at hazardous waste facilities licensed under *The Dangerous Goods Handling and Transportation Act*. • All waste stored at designated hazardous waste storage areas shall be removed from the site at least once every seven (7) days. • Hydrocarbons shall not be stored or disposed of in earthen pits on-site.	With implementation of the outlined mitigation measures potential effects on soil, groundwater, and human health are expected to be minimal and short term in duration.	With implementation of the outlined mitigation measures residual effects are expected to be low.

Environmental Component	Potential Environmental Effect	Mitigation Measures	Effects Rating	Residual Effects
		• All used oils shall be stored in appropriate drums or tanks until removed to a registered waste oil recycling centre or hazardous waste disposal facility. Used oil filters shall be drained, placed into suitable storage containers, and disposed of at approved waste oil facilities. The oil drained out of the used filters shall be collected and handled in the same manner as used oil.		
Other	**Issue 9c:** Site restoration: • Aesthetics	Following the construction of the Project, any disturbed areas will be graded and revegetated as applicable.	The visual aesthetic will be minimal, short term in duration and limited to the Project footprint.	No residual effects are anticipated.
B. Socio-economic Environment				
Cultural/ Historic Resources	**Issue 11:** General impact	The following mitigation measures will be employed to minimize potential impacts to cultural / historic resources: • Should any cultural or historic artifacts be uncovered during construction, all work will immediately stop, and the Contract Administrator and Band Liaison will be immediately informed.	Potential effects are anticipated to be negligible minimal, restricted to Project footprint and temporary as there are no known historic resources in the Project footprint.	No residual effects are anticipated.
Community	**Impact 12:** Traffic Access Safety	All required safety measures will be undertaken during construction including: • Fully signed traffic routing will be provided if required. • The routing of construction equipment will be along designated and approved routes. • The speed of construction equipment will be controlled to the approved speed limits.	With appropriate mitigation measures, effect on local traffic access will be minimal, short term in duration and periodic over the construction period.	Residual effects are anticipated to be minimal.

5.2 RESIDUAL EFFECTS

Residual environmental effects are anticipated to be negligible or low for most environmental components including air quality/noise, soil, groundwater, wildlife, and vegetation.

If mitigation measures are followed, there are no anticipated concerns for any residual effects for the Project.

Refer to previous **Table 5** for the anticipated residual effects on each environmental component.

6 FOLLOW-UP, MONITORING, AND REPORTING

During the construction and operation of the groundwater well and raw water pipeline system, the proponent will adhere to any follow-up and reporting requirements:

- Outlined in the EAL issued for the project (e.g., groundwater quality monitoring).
- Requested by other regulatory agencies or provincial or municipal departments (e.g., Manitoba Transportation and Infrastructure, CP Rail).
- Documentation and reporting of any significant events will be completed in accordance with the EAL or other regulatory agency requirements.

7 CONCLUSIONS

The Monarch Hutterite Colony is planning to construct a new groundwater well and raw water supply line to serve their colony located in southwest Manitoba. The proposed new wellsite is to be located on NE-17-16-27W1 within an existing agricultural field. The raw water pipeline would extend from the new wellsite for approximately 17.5 km northwards, along existing, pre-disturbed road allowances to terminate at or near the existing water treatment plant at the Colony at NW-35-17-27WPM. The water pipeline will need to cross several order 1 and 2 drains as well as a CP rail line. All drains along the route of the proposed water line are under the jurisdiction of the Municipality of Prairie View. Land use within the project study area is primarily rural agricultural land.

In addition to an EAL, other applicable regulatory permits/approvals will be obtained in support of the project (e.g. Water Rights License, CP rail crossing, etc.).

Potential environmental effects from the project were identified to be associated with temporary increase in air and noise pollution associated with construction activities, disturbance to soil conditions from installation of the groundwater well and trenching of the new water pipeline, potential impact to groundwater from introduction of deleterious substances during well development and operation, and potential temporary disturbance to drains (aquatic systems), wildlife and native vegetation adjacent to or within the Project footprint from water pipeline installation. With the implementation of appropriate mitigation measures and best management practices, Project works are anticipated to have a negligible to low residual impact on air quality/noise soil, groundwater, aquatic systems, wildlife and vegetation.

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APPENDIX

A MAPBOOK

APPENDIX

B DRAWINGS

APPENDIX

C LAND TITLE

APPENDIX

D SUPPORTING DOCUMENTS

APPENDIX

E PHOTOGRAPHS

APPENDIX

F

HYDROGEOLOGICAL REPORT