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To:	Landmark Planning & Design Inc. / EdgeEffects Environmental Planning		
From:	Jeff O'Driscoll, P.Eng., IRP		
Client:	Mid-West Planning District		
Project Name	Development Plan Review		
Subject:	Engineering Background Study		

TECHNICAL MEMORANDUM

1 ENGINEERING STUDY

An engineering background study was completed to assist in the Mid-West Planning District Development Plan review being undertaken by Landmark Planning & Design Inc. and EdgeEffects Environmental Planning.

The study characterised the water, sewage, storm drainage, transportation and solid waste systems in the major communities of the planning district. For each system, a general description of the infrastructure was noted, taking into consideration the condition, capacity for expansion and compliance with applicable standards. Issues related to the infrastructure were also noted.

The assessment was completed based on a review of the available information, including reports and discussions with municipal and provincial employees.

2 INFRASTRUCTURE ASSESSMENT DETAILS

2.1 Community of St. Lazare

Water System Assessment

The Community of St. Lazare's municipal water system provides residents with potable water for both domestic and fire fighting capability through hydrants located in the community. Raw water is taken from a spring fed pond, treated, stored and piped throughout the community. The water treatment system was upgraded approximately five years ago, is in good condition and meets provincial compliance standards. The system has adequate capacity for community expansion.

Overview

- Licensed public water system
- Population served ~ 265
- Surface water source from a spring fed pond
- Class 1 Facility with Level 1 certified water treatment plant operators

- Water treatment process
  - Biological filtration (bio sand – ozone – UV disinfection – chlorine disinfection)
- Capacity ~2.4 (litres per second) L/sec
- Average daily consumption ~1.0 L/sec
- Treated storage ~ 95,000 L
- Treated water quality meets regulatory standards
- Water distribution:
  - 150 mm diameter and 100 mm diameter watermains
  - Materials: PVC with some cast iron
  - Low watermain break frequency
  - Adequate system water pressure, except in higher areas that require pressure boosting
  - Fire protection (hydrants)

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Domestic sewage is collected by gravity and treated in a facultative wastewater lagoon. The lagoon is located in a converted oxbow and does not meet current standards. A new facultative lagoon is being proposed which will be compliant with provincial regulations and will allow for community expansion. Initial design and environmental approvals are ongoing and the project is awaiting funding.

Overview

- Gravity wastewater collection to the lagoon
- Collection piping is mostly 200 mm diameter asbestos-cement
- Existing lagoon is located within a flood protected converted old oxbow
- A two-cell lined facultative lagoon is being proposed with funding and technical assistance by the Province of Manitoba
- The new lagoon will be compliant with provincial regulations and have adequate capacity for community expansion

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system. Although the community is protected by dykes along the river, flood pumping is required during high river events. In addition, these dykes were raised in 2011 in response to flooding conditions. The system is in good condition based on the

2011 upgrades and the existing storm drainage infrastructure has capacity for community expansion. The ring dike in St-Lazare provides flood protection to 2011 levels plus 1.2 meters.

Transportation System Assessment

The community is serviced with a road network of residential streets. Highway 41 winds through though the community. Road and highway conditions are good. Some issues were noted by the public works staff related to roadway sloughing on the escarpment requiring ongoing maintenance. They also noted that the bridge north of Highway 41, west of the community spanning the Qu'Appelle River, is in poor condition and does not allow area farmers to cross with their equipment. The bridge is an asset of Manitoba Infrastructure. No expansion of the local or area road networks was identified by the public works staff.

Overview

- Road network is functional, although there are ongoing issues with road and highway sloughing on the hill
- No bridges in the community, just large diameter culverts
- Bridge north of Highway 41, 2 km west of the community spanning the Qu'Appelle River is in poor condition and area farmers cannot get equipment across the bridge
- The bridge is an asset of Manitoba Infrastructure

Solid Waste Management Assessment

A Class III waste disposal ground (Permit 8002) site is located east of community along Highway 42 on SW 10-17-28 WPM. The site is in good condition and has capacity for future growth.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment include:

- Area northwest of the community within the existing ring dike area
    - Flood protected and close to water and sewer services
- Area east of the community on the top of the escarpment

2.2 Community of McAuley

Water System Assessment

The Community of McAuley's municipal water system provides residents with potable water for domestic needs. Water is obtained from wells, treated and piped throughout the community. The water system is in good condition,

meets provincial compliance standards and has adequate capacity for community expansion. The water supply and distribution system does not include fire protection.

Overview

- Licensed public water system
- Population Served ~ 106
- Groundwater supply source from well

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Sewage is collected and treated in a two-cell facultative lagoon located northeast of the community on NW 11-15-29 WPM. The lagoon meets current provincial standards. The system has capacity for expansion. The lagoon does not include truck haul receiving facilities.

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system. Ditches run along the road network directing runoff away from properties and directing drainage to the adjacent highway drains or railway drainage systems. There is estimated to be adequate capacity for community expansion to these drains considering provincial drainage requirements are met.

Transportation System Assessment

The community is serviced with a road network of residential streets, generally in good condition as characterized by the public works staff. Highway 41 runs adjacent to the community to the east. No expansion of the local or area road networks was identified. No bridges or other major transportation infrastructure are located in the community.

Solid Waste Management Assessment

Solid waste disposal is handled by a facility located on the NW 14-14-29 WPM. No issues were noted by public works staff related to condition or capacity of the facility.

Summary

Based on the infrastructure review the area best suited for development without major infrastructure investment is:

- Area northwest of the community allowing ease of expansion of water and sewer infrastructure

2.3 Community of Foxwarren

Water System Assessment

Water is provided through private wells. There is adequate capacity for community expansion with additional private wells. With no piped water distribution network, fire protection is not provided.

Sewage System Assessment

A municipal sewage collection system and facultative lagoon service the community. Sewage is collected in household septic tanks and pumped through a low pressure pipe network to the lagoon. The two-cell lagoon, located on SW 4-18-27 WPM, has adequate capacity for current and future growth. The system is currently compliant with provincial standards. Groundwater infiltration and weeping tile discharges into the system have affected lagoon capacity in the past.

Overview

- Private septic tank and pumps
- Community serviced by a low pressure sewer collection system
- A two-cell facultative lagoon with truck haul receiving facilities

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system. Ditches, with culverts under crossings, run along the road network directing runoff away from properties and directing drainage to the adjacent highway drains or railway drainage systems. There is estimated to be adequate capacity for community expansion to these drains considering provincial drainage requirements are met.

Transportation System Assessment

The community is serviced with a road network of residential streets, which are generally in good condition. Highway 16 runs adjacent to the community to the north. No expansion of the local or area road networks was identified. No bridges or other major transportation infrastructure are in the community.

Solid Waste Management Assessment

Solid waste disposal is handled though a Class III waste disposal ground (permit 8015), which is located outside of community on NW 5-18-27 WPM. The facility is compliant with provincial regulations and has capacity for future growth in the region.

Summary

Based on the infrastructure review, the areas best suited for development without major infrastructure investment include:

- Areas east and west of the community with consideration of the proximity and access due to the rail infrastructure
- Southern development may be impacted by setback requirements with the community lagoon
- Northern development will be impacted by Highway #16

2.4 Community of Birtle

Water System Assessment

The Community of Birtle's municipal water system provides residents with potable water for both domestic and fire fighting capability through hydrants located in the community. Raw water is taken from wells, treated, stored and piped throughout the community. The water treatment system has been characterized as being in poor condition and requires upgrading. A boil water advisory was issued by the Province in May 2017. The community is investigating alternate groundwater supplies and the development of a new water treatment plant to replace the existing facility. The water system upgrades will allow for future growth and extension of services in the community (Source: The Manitoba Water Service Board, Town of Birtle, Water Supply Feasibility Study, W.L. Gibbons and Associates, December 2014; Municipality of Prairie View, Water Supply Feasibility Study, Hopers Lake Area Groundwater Investigation, W.L. Gibbons and Associates, August 2016). In April 2017, funding (Federal/ Provincial) was announced related to the project. Reference Figure 1 for details on the existing water, sewer and lagoon locations.

Overview

- Licensed Public Water System
  - Under boil water advisory
- Population Served ~ 750
- Groundwater source, wells
- Piped distribution system
- Fire protection (hydrants)

IF NOT 25 mm ADJUST SCALES
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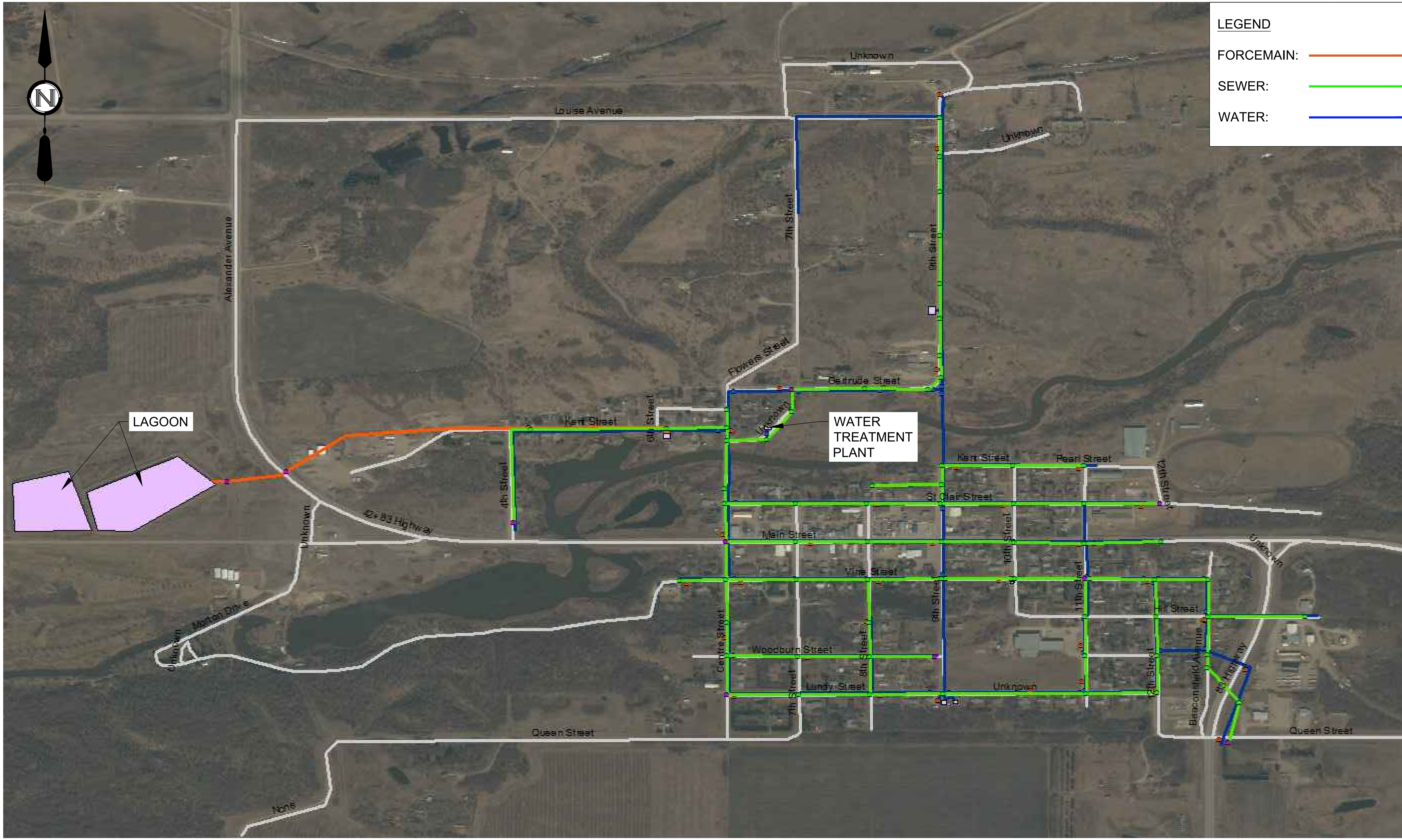
SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



AE PROJECT No. 21064876
SCALE N/A
APPROVED
DATE 2017MAY24
REV 0
DESCRIPTION FOR INFORMATION ONLY

FIGURE 1

TOWN OF BIRTLE
ENGINEERING BACKGROUND STUDY

CIVIL
EXSITING SEWER, WATER
AND LAGOON

Associated Engineering

CANADA'S BEST MANAGED COMPANIES Platinum member

C:\Users\dychkot\Documents\BIRTLE PROJECT\BIRTLE MAP.dwg
DATE: 2017-05-24, Tyler Dychko

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Sewage is collected by gravity into a main lift station which pumps wastewater to a two-cell facultative lagoon located west of the community on NE 1-17-27 WPM. The lagoon is experiencing capacity issues as reported by the Province of Manitoba (including, but not limited to hydraulic capacity, sludge volume, etc.). The community is conducting a capacity study to review mitigation measures for compliance. The current condition of the facility does not support the expansion of services in the community.

Overview

- Gravity wastewater collection system with lift station
- A two-cell lagoon is located west of the community
- The lagoon does not include truck haul receiving facilities
- The lagoon is experiencing hydraulic capacity issues, which is possibly attributed to high sludge volume
- Land is available north the existing lagoon cells that could be considered for expansion

Storm Drainage Assessment

Drainage in the community is handled through a combination of buried storm water piping and open ditch storm water collection systems (residential areas). In 2014 the community encountered extensive flooding from the adjacent Birdtail River which included diking around the water plant and lift station, and the Centre Street Bridge had been weighted down to mitigate the effects of the surge. Development in these areas should be avoided without additional flood protection.

Transportation System Assessment

The community is serviced with a road network of residential and collector streets, which are generally in good condition. Highway 42, Main Street, runs east to west through the northern portion of the community. Highway 83 meets Highway 42 on the eastern limits. No expansion of the local or area road networks was identified.

Solid Waste Management Assessment

Solid waste disposal is handled through a waste disposal site located northwest of the community on NE 1-17-27 WPM.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment (subject to resolving wastewater treatment facility capacity issues) include:

- Areas north and northeast of Gertrude Street
  - Ease of extension of water and sewer infrastructure
  - Areas are also higher in elevation related to flood protection

2.5 Community of Miniota

Water System Assessment

Water is provided through private wells. There is adequate capacity for community expansion with additional private wells. An option to upgrade the community with a piped water system connected to the Wallace Regional Water System is feasible. In discussions with the Manitoba Water Services Board, it was noted that this project is currently not being pursued by the community. The system would provide a reliable, high quality source of water with adequate capacity for growth. With no piped water distribution network, fire protection is not provided.

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Sewage is collected by gravity that discharges to a two-cell facultative lagoon located southwest of the community on NE 25-13-27 WPM. The lagoon is compliant with regulations and has capacity for future growth.

Overview

- Gravity wastewater collection
- Two-cell lagoon with truck haul receiving facilities

Storm Drainage Assessment

Drainage in the community is handled by an open ditch storm water collection system. Runoff is collected in shallow swales located along the roadways.

Transportation System Assessment

The community is serviced with a road network of residential streets, generally in good condition. Highway 83 runs through the community from north to south. Highway 24 runs from the east joining Highway 83 to the south of the community. No bridges or other major transportation infrastructure are located in the community.

Solid Waste Management Assessment

Solid waste disposal is handled through a waste disposal site located southwest of community om NE 25-13-27 WPM.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment include:

- Areas west, east and north of the community
  - Ease of developing new private wells and extending sewer infrastructure
- Southwest development may be impacted by setback requirements with the community lagoon

2.6 Community of Hamiota

Water System Assessment

The Community of Hamiota's municipal water system provides residents with potable water for both domestic and fire fighting capability through hydrants located in the community. Raw water is drawn from wells, treated, stored and piped throughout the community. The water treatment system is in good condition and meets provincial compliance standards. The system has adequate capacity for community expansion of additional water services.

Overview

- Licensed public water system
- Population served ~ 858
- Groundwater water source
- The source is characterized as being groundwater under the direct influence of surface (GUDI) water which requires additional treatment to be considered to meet water quality regulations. GUDI refers to groundwater sources (wells, springs, infiltration galleries, etc.) where microbial pathogens are able to travel from nearby surface water to the groundwater source.
- Class II Facility with Level II certified water treatment plant operators
- Water treatment process
- Greensand – reverse osmosis– chlorine disinfection, capacity ~6 L/sec
- System capable of handling summer peak demands
- Treated water quality meets standards (source: Office of Drinking Water)
- Distribution:
  - 150 mm diameter and 200 mm diameter PVC watermains
  - Low break frequency
  - Adequate system water pressure
  - Fire protection (hydrants)

Sewage System Assessment

A municipal sewage collection and treatment system service the community. Domestic sewage is collected by gravity into a lift station which pumps wastewater to a facultative lagoon located outside of the community on SW 8-15-23 WPM. The system is in good condition with adequate capacity for current and future growth. The system is currently compliant with provincial standards.

Overview

- Land available at lagoon site for future expansion
- Gravity wastewater collection to lift station
- No standby power at lift station. Standby power would provide a higher level of service and resiliency
- The lagoon does not include truck haul receiving facilities

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system. There is some minor water ponding in areas during high intensity rainfall events.

Transportation System Assessment

The community is serviced with a road network of residential streets, which are generally in good condition. Highway 21 runs through the community from north to south. Highway 24 is located south of the community and Highway 16 is located to the north. The public works staff noted that the last three miles of Highway 21, as it enters the community from the north, does not meet Road and Transportation Association of Canada (RTAC) standards, therefore restricting truck movement into and out of the community from Highway 16. No expansion of the local or area road networks was identified. No bridges or other major transportation infrastructure are located in the community.

Overview

- Road network functional
- Highway 21 north of community is not RTAC rated for last three miles into the community. These road restrictions affect truck movement into and out of the community.

Solid Waste Management Assessment

Solid waste disposal is handled through a Class II waste disposal ground (permit 8023) site located southeast of the community on NW 33-13-23 WPM. The facility is compliant with provincial regulations and has capacity for future growth in the region.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment include:

- Areas west and southwest of the community
  - Ease of extension of water and sewer infrastructure
- Eastern and southern development may be impacted by setback requirements with the community lagoon

2.7 Community of Oak River

Water System Assessment

A municipal water system services residents with potable water for both domestic and fire fighting capability through hydrants located in the community. Raw water is taken from wells, treated, stored and piped throughout the community. The water system is operated by the Manitoba Water Services Board and water is sold to the community. The Manitoba Water Services Board provides this service to several comminutes in Manitoba, although in the past many more communities operated under this arrangement. The water treatment system is in good condition with adequate capacity for current and future growth. The system is currently compliant with provincial standards.

Overview

- Water system operated by the Manitoba Water Services Board
- Population served ~ 100
- Groundwater source is from two wells
- Water distribution via watermains
- Fire protection (hydrants)

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Sewage is collected and treated at a facultative lagoon located southeast of the community on NE 28-13-22 WPM. The system is in good condition

with adequate capacity for current and future growth. The system is currently compliant with provincial regulations. The lagoon includes truck haul receiving facilities.

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system.

Transportation System Assessment

The community is serviced with a road network of residential streets, generally in good condition. Highway 24 runs through the community. No bridges or other major transportation infrastructure are in the community.

Solid Waste Management Assessment

Solid waste disposal is handled through a waste disposal site located outside of community on NW 1-14-22 WPM.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment include:

- Areas west and southwest of the community
  - Ease of extension of water and sewer infrastructure
- Eastern and southern development may be impacted by setback requirements with the community lagoon

2.8 Community of Rapid City

Water System Assessment

The Community of Rapid City's municipal water system provides residents with potable water for domestic needs from the Odanah Regional Water System. The system is in good condition with adequate capacity for current and future growth.

Overview

- Licensed public water system
- Population served ~ 424
- Source: Odanah Regional Water System
- Treated storage ~190,000 L
- Piped distribution system
- Fire protection (hydrants)

Sewage System Assessment

A municipal sewage collection and treatment system services the community. Domestic sewage is collected and treated at a facultative lagoon located west of the community on 19-13-19 WMP. An upgraded facility is being proposed. In April 2017, funding (Federal/ Provincial) for a study and licensing for the Lagoon was announced.

Storm Drainage Assessment

Drainage in the community is handled through an open ditch storm water collection system.

Transportation System Assessment

The community is serviced with a road network of residential streets, generally in good condition. Highway 24 runs through the community east-west with PR 270 running north-south. No expansion of the local or area road networks was identified. A two-lane bridge spanning the Little Saskatchewan River along PR 270 is located in the northern part of the community. The bridge is an asset of Manitoba Infrastructure and is in good condition.

Solid Waste Management Assessment

Solid waste disposal is handled through a Class II waste disposal ground (permits 7990, 33175) site located north of community on SW 29-13-19 WPM.

Summary

Based on the infrastructure review the areas best suited for development without major infrastructure investment include:

- Areas northeast, east and south of the community
    - Ease of extension of water and sewer infrastructure
- Western development may be impacted by setback requirements with the community lagoon

2.9 Other Communities

No municipal services are in place for the communities of Solsgirth, Arrow River, Beulah, Crandall, Isabella, Decker, Oakner, Cardale, and Manson. These communities rely on private or semi-private services and were not assessed.

2.10 Definition of Content

This document is intended to provide general background information for the preparation of the development plan review purposes only. The analysis is based on information and data provided by provincial and municipal sources. The assessment does not guarantee the completeness or accuracy of such information and data. Additional studies must be undertaken prior to any development, upgrading or expansion of municipal infrastructure.