



a division of Englobe



ROCKY VIEW COUNTY  
Cultivating Communities

*Final Report for:*

## ROCKY VIEW COUNTY

# CONRICH WASTEWATER SERVICING PLAN REVISION 4

---

**Corporate Contact:**

Jill Hardy, P.Eng.  
Project Manager

MPE a division of Englobe  
#320, 6715 – 8 Street NE  
Calgary, AB T2E7H7

Phone: 403-219-6319  
Email: [jhardy@mpe.ca](mailto:jhardy@mpe.ca)

Date: May 9, 2024

***Proud of Our Past... Building the Future***

***[www.mpe.ca](http://www.mpe.ca)***

Rocky View County  
262075 Rocky View Point  
Rocky View County, AB  
T4A 0X2

May 9, 2024  
File: N:\2285\069-02\R02

**Attention: Steve Altena, P.Eng., MPlan**  
**Supervisor – Planning Policy**

Dear Steve:

**Re: Conrich Wastewater Servicing Plan – Final Report – Revision 4**

Enclosed is Revision 4 of the *Conrich Wastewater Servicing Plan*, prepared by MPE a division of Englobe, as requested by Rocky View County. This report contains our findings and recommendations with regards to servicing the future build-out of the Conrich area with Wastewater Infrastructure to reflect the latest update of the Conrich Area Structure Plan.

If there are any questions, please contact the undersigned at 403-219-6319.

Yours truly,

**MPE a division of Englobe**



Jill Hardy, P.Eng.  
Project Manager

JH/dm  
Encl.

cc: Milan Patel, Rocky View County

## CORPORATE AUTHORIZATION

This report has been prepared by MPE a division of Englobe under authorization of Rocky View County. The material in this report represents the best judgment of MPE a division of Englobe given the available information. Any use that a third party makes of this report, or reliance on or decisions made based upon it is the responsibility of the third party. MPE a division of Englobe accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based upon this report.

Should any questions arise regarding content of this report, please contact the undersigned.

### MPE a division of Englobe

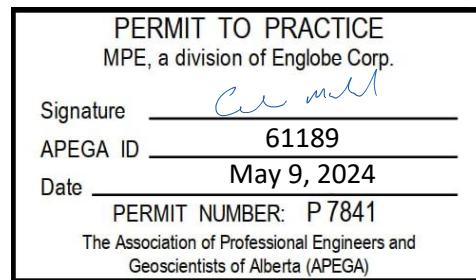


2024-05-09

Jill Hardy, P.Eng.

---

Professional Seal



---

Corporate Permit

## EXECUTIVE SUMMARY

Rocky View County (RVC) has retained MPE a division of Englobe (MPE) to establish a Wastewater Servicing Plan for the East Rocky View Conrich area. Conrich is bordered by the City of Calgary to the west and south. The area is predominantly agricultural pastures and a small hamlet area. RVC approved the Conrich Area Structure Plan (ASP) in December 2015, which consists of two subsequent amendments. RVC is currently in the process of amending the ASP in 2024, as such, Revision 4 of the Conrich Wastewater Servicing Plan accounts for the proposed adjustments. The purpose of the Conrich Wastewater Servicing Plan is to provide recommendations for wastewater servicing and act as a guiding document for development.

The Conrich area is part of a larger regional system that has been established by RVC. This regional system consists of the East Rocky View Wastewater Transmission Main (WWTM) which conveys wastewater flows from the Balzac area to the Langdon Wastewater Treatment Plant (WWTP). The optimum method of servicing the Conrich area for wastewater servicing is to tie into the WWTM.

Design capacities for this servicing plan are based on a water consumption rate of 340 liters per capita per day (l/c/day) and a wastewater generation of 306 l/c/day (90% of water demand). Population projections were based on land use and densities of 0.37 to 13.1 units per acre, consisting of 1.8 to 2.7 persons per unit for residential and 3.4 m<sup>3</sup>/day per gross acre for institutional, commercial and industrial sectors. Total ultimate average wastewater flow for the Conrich area is approximately 30,000 m<sup>3</sup>/day based on the parameters above.

This plan assumes when development occurs, the Langdon WWTP will have the capacity to accommodate the additional flows to the system. Analysis of the Langdon WWTP was not undertaken as part of this study.

Currently, only a small portion (Cambridge Estates and Prince of Peace) of the study area has wastewater services. If the entire study area is to be fully developed, additional transmission main capacity will be required to service this area, along with upgrades to the WWTP.

Key conclusions of the report are:

- The Conrich area wastewater system is intended to tie into the existing WWTM.
- A series of gravity mains are proposed to be installed in the Conrich area to convey wastewater to lateral lift stations in order to tie into the WWTM.
- A Low Pressure System is proposed to service the extreme northeast corner of the study area due to the location and grades of the area.
- At full build-out, the plan area will require:
  1. Option 1: an additional six lateral lift stations with forcemains which would connect to the WWTM and a low pressure system.
  2. Option 2: an additional six lateral lift stations. Only three of which would connect to the WWTM and a low pressure system.
- Lift stations and pumps have been evaluated in accordance with full build-out; however, the designs must be refined once land use has been finalized.
- Area residents currently on septic field systems are recommended to be connected to the regional system once available. Septic fields should be abandoned as per Alberta Environment and Protected Areas (AEPA) guidelines.
- Areas where there is existing wastewater infrastructure and where developments are approved are proposed to be the initial area to focus development.
- Assessing the plan area and the proposed wastewater infrastructure (collection system, lift stations, forcemains) required to service the entire area, a cost of \$1,098.19/m<sup>3</sup>/day has been determined for Option 1 and \$1,108.45/m<sup>3</sup>/day for Option 2. In addition to these levies, the Conrich area would be subject to levies associated with the Langdon WWTP (\$8,437.88/m<sup>3</sup>/day) and for the East Rocky View WWTM (\$7,599.49/m<sup>3</sup>/day). Additional costs may be required to cover further upgrades to the WWTP and trunk mains to accommodate future growth.

Recommendations include:

- Completion of an Infiltration and Inflow (I&I) assessment of the existing wastewater system to determine if repairs can be made that could extend the capacity of the existing infrastructure.
- As lift stations are connected to the WWTM, an assessment should be completed of the entire transmission main. This is to ensure the existing system is not being significantly affected by the addition of the lift stations.

## TABLE OF CONTENTS

### LETTER OF TRANSMITTAL

### CORPORATE AUTHORIZATION

### EXECUTIVE SUMMARY

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	OVERVIEW .....	1
1.2	PLAN SCOPE .....	1
1.3	OBJECTIVE .....	1
1.4	BACKGROUND .....	2
<b>2.0</b>	<b>EXISTING WASTEWATER INFRASTRUCTURE .....</b>	<b>4</b>
2.1	REGIONAL WASTEWATER SERVICING .....	4
2.1.1	<i>East Rocky View Wastewater Transmission Main .....</i>	<i>4</i>
2.2	CONRICH AREA WASTEWATER SERVICING .....	7
2.2.1	<i>Individual Lot Servicing .....</i>	<i>7</i>
2.2.2	<i>South Conrich .....</i>	<i>7</i>
2.2.3	<i>Committed Servicing Agreements .....</i>	<i>8</i>
2.3	CURRENT AND PROJECTED REGIONAL FLOWS .....	9
2.4	REGIONAL SYSTEM LIMITATIONS .....	10
<b>3.0</b>	<b>PROJECTED DESIGN PARAMETERS .....</b>	<b>11</b>
3.1	LAND USE .....	11
3.2	PROJECTED WATER DEMAND DESIGN PARAMETERS .....	11
3.3	WASTEWATER FLOW DESIGN PARAMETERS .....	12
<b>4.0</b>	<b>CONRICH AREA WASTEWATER SERVICING .....</b>	<b>13</b>
4.1	GENERAL .....	13
4.2	PROPOSED WASTEWATER SERVICING .....	13
4.3	OPTIONS .....	15
4.4	DEVELOPMENT PHASING OPTIONS .....	18
4.4.1	<i>Interim Routing .....</i>	<i>19</i>
<b>5.0</b>	<b>CAPITAL AND OPERATIONAL COSTS .....</b>	<b>21</b>
5.1	WASTEWATER INFRASTRUCTURE CAPITAL COSTS .....	21
5.2	WASTEWATER OPERATIONAL COSTS .....	21
5.3	OFF-SITE LEVY COSTS .....	22
	<b>WASTEWATER INFRASTRUCTURE .....</b>	<b>22</b>
<b>6.0</b>	<b>CONCLUSIONS .....</b>	<b>23</b>
<b>7.0</b>	<b>RECOMMENDATIONS .....</b>	<b>25</b>
<b>8.0</b>	<b>REFERENCES .....</b>	<b>26</b>

**APPENDICES**

- Appendix A-1: Conrich ASP Land Use Maps from RVC – 2023  
Appendix A-2: Conrich ASP Land Use Maps from RVC – 2024  
Appendix B: Wastewater Flows  
Appendix C: Opinion of Probable Cost

**TABLES**

- Table 2.1 Existing Capacities for the Conrich Lateral Lift Station (LLS)  
Table 3.1 Water Demand Design Parameters  
Table 4.1 Proposed Wastewater Infrastructure Design  
Table 5.1 Wastewater Infrastructure Capital Costs  
Table 5.2 Off-Site Levy Wastewater Costs

## **1.0 INTRODUCTION**

### **1.1 Overview**

MPE a division of Englobe (MPE) has been retained by Rocky View County (RVC) to establish a Wastewater Servicing Plan for the Conrich area. The Wastewater Servicing Plan is to be used as a guiding document in support of the Conrich Area Structure Plan (ASP).

Revision 4 of the Conrich Wastewater Servicing Plan updates the previous December 21, 2020 Revision 3 Draft Report. This report accounts for the most recent Conrich ASP update from RVC, including changes planned for the Hamlet Core. The ASP servicing documents include four studies: water, wastewater, stormwater, and transportation. This document focuses on the wastewater system that will service the study area.

### **1.2 Plan Scope**

The scope of this study is to analyze future wastewater collection in the Conrich area that will integrate with existing wastewater infrastructure.

### **1.3 Objective**

The key objectives of the plan are to:

- Evaluate the existing wastewater infrastructure.
- Develop servicing strategies that will allow future development to occur in a responsible manner with a focus on integration to the regional servicing system.
- Concentrate on the wastewater servicing for future development of the Conrich area.
- Identify existing private and communal wastewater systems within the plan area including their current service areas, treatment technologies, disposal fields, current flows, and maintenance records, if available.
- Review existing servicing agreements.
- Identify growth areas, population projections and project wastewater flows.
- Evaluate the capacity of existing wastewater infrastructure in the Conrich area, including the regional East Rocky View Wastewater Transmission Main (WWTM).



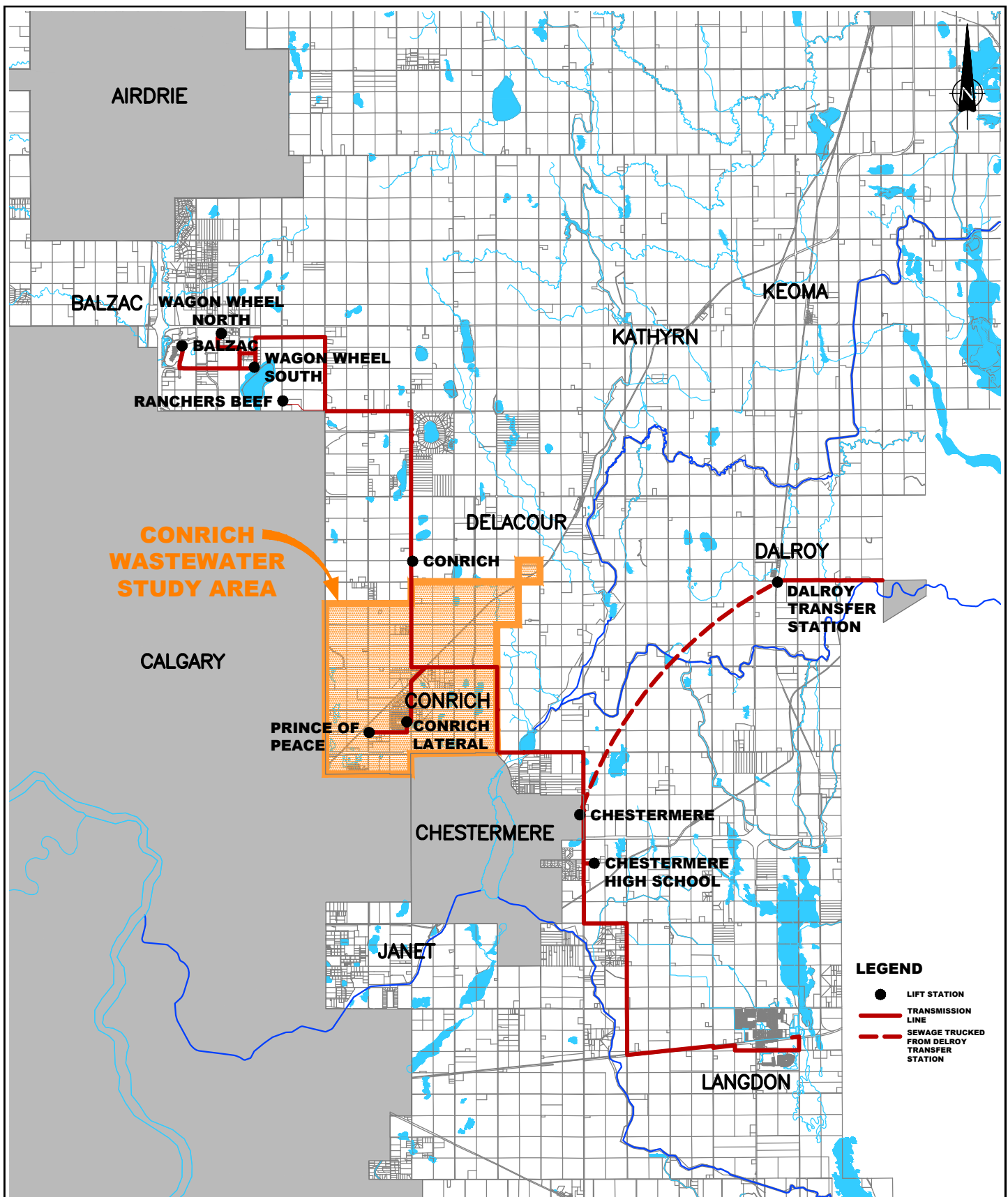
- Identify potential location(s) of future lift stations, if required.
- Review potential alignments for gravity sewers in the Conrich area considering natural topography, environmental constraints, land ownership, and future developments.
- Establish land requirements and right-of-way dedication required for wastewater servicing.
- Develop the conceptual design of a collection system, and determine the sizing for collector mains and lift stations to meet maximum day and peak hour flows.
- Determine most suitable connection point to the WWTM.
- Develop phasing options based on current development demands.
- Develop order-of-magnitude capital cost of capital infrastructure.

## 1.4 Background

The Conrich Plan area is located immediately east of the City of Calgary. It is bounded by the City of Calgary at Stoney Trail to the west. Highway 1 runs east/west through the south portion of the plan area, with the Hamlet of Conrich located roughly in the middle. Due to the proximity to the City of Calgary, the area has significant potential for residential, commercial and industrial growth. The plan area is shown on **Figure 1**.

RVC initially approved the *Conrich Area Structure Plan (ASP)* in December 2015 with subsequent amendments which were reflected in previous revisions of this Wastewater Servicing Plan. At this time, RVC is in the process of updating the ASP and has requested that the wastewater servicing plan be updated to reflect the changes.

Based on the land use provided by RVC, Conrich is a mixed-land use region. Industrial and commercial use development lines the main corridors, with single family and medium density housing located in clustered development nodes throughout the area. For the purpose of this plan, the landuse map in **Appendix A-1** from the *2023 Draft Conrich ASP* was utilized to establish the design flows. The land use map was updated by RVC in April 2024 and is included in **Appendix A-2**. The ultimate build-out (Long-term Development) timeframe is anticipated to be greater than 30 years. This study maintains the approach used in previous studies which includes an initial Phase 1 build-out (0 to 10 years) and a Phase 2 build-out (10 to 20 years). The proposed RVC phasing is shown on **Figure 2**.



a division of Englobe

## ROCKY VIEW COUNTY

CONRICH WASTEWATER SERVICING PLAN  
EAST ROCKY VIEW REGIONAL WASTEWATER  
TRANSMISSION MAIN AND EXISTING  
LIFT STATION LOCATIONS

SCALE: 1:200,000

DATE: JANUARY 2024

JOB: 2285-069-02

FIGURE: 1

## 2.0 EXISTING WASTEWATER INFRASTRUCTURE

### 2.1 Regional Wastewater Servicing

#### 2.1.1 East Rocky View Wastewater Transmission Main

A regional system was designed and constructed to service development within RVC north and east of Calgary. Balzac was one of the first developments that helped initiate the system which extends south to Langdon and provides the opportunity for the Conrich area to further develop.

The WWTM was constructed from 2005-2007 and consists of approximately 54 km of 600 mm PVC forcemain. Along the WWTM, there are three in-line lift stations including the Conrich (Regional) Lift Station located north of the Hamlet of Conrich on Range Road 284. The WWTM passes through the Conrich Servicing Area, as shown on **Figure 2**.

The WWTM was initially intended to service the following areas:

- East Balzac.
- Calgary-Chestermere Corridor.
- Conrich.
- Dalroy.
- Potential other connections to be made in the future.

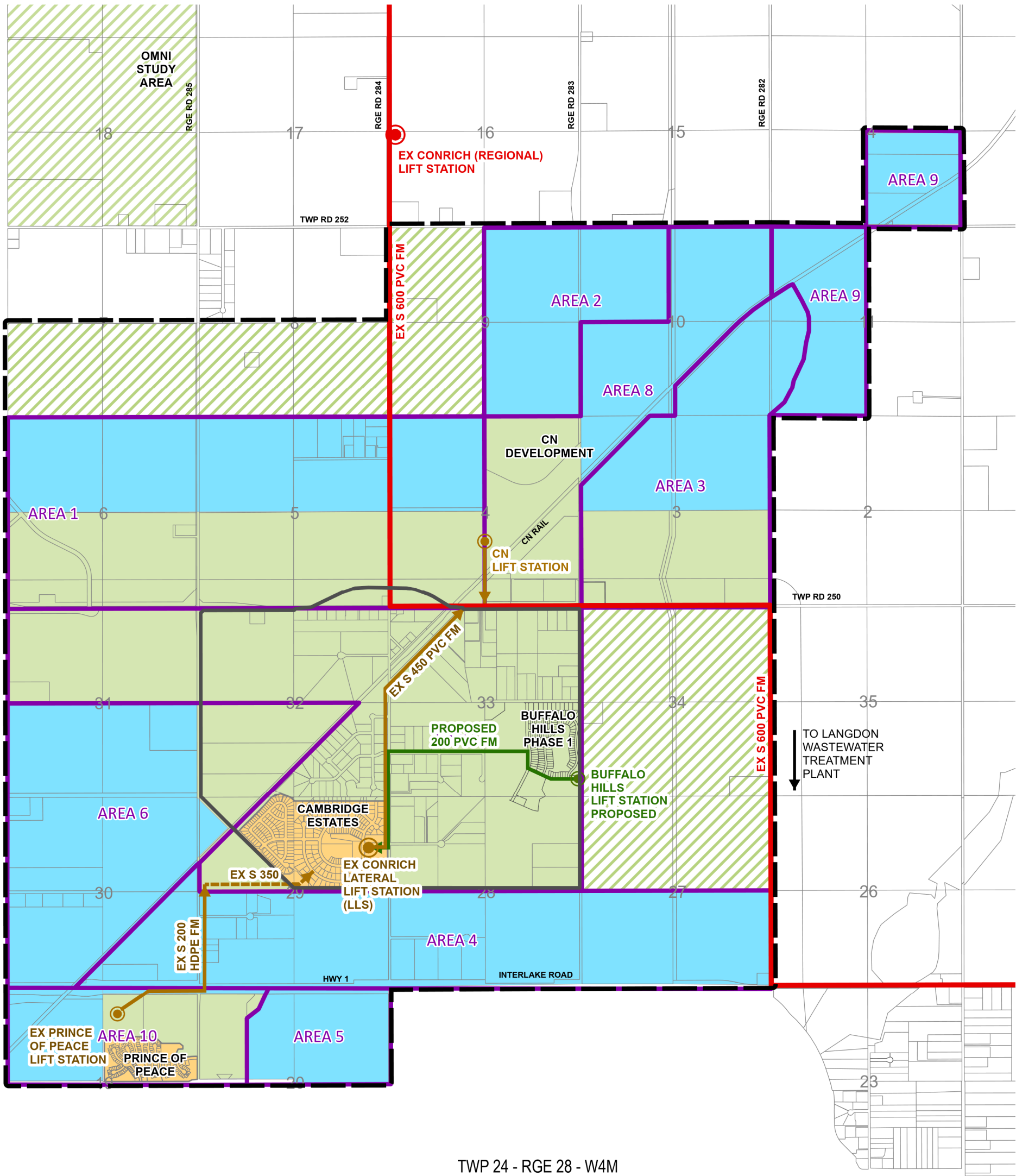
Various development plans related to the above areas and outside of Conrich have conceptualized using the WWTM for wastewater servicing. These studies included:

- *Balzac East Area Structure Plan* prepared by Municipal District of Rocky View No. 44, Department of Planning and Development, Bylaw C-5177-2000, Adopted September 26, 2000.
- *Calgary-Chestermere Corridor Area Structure Plan* prepared by Municipal District of Rocky View No. 44, Schedule “A” to Bylaw C-5980-2004, December 2004.
- *East Rocky View Regional Utility Servicing* prepared by Morrison Hershfield, presented to the Municipal District of Rocky View No. 44, November 24, 2005.
- *South Conrich Conceptual Scheme* prepared by Municipal District of Rocky View No. 44, Department of Planning and Development, Bylaw C-6401-2006, Adopted July 31, 2007.

- *OMNI Area Structure Plan: Servicing Strategy*, prepared by MPE Engineering Ltd. on behalf of Rocky View County, August 21, 2017.

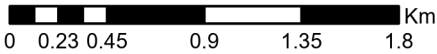
Based on the *ERRWWTM Capacity Overview* completed by Sim-Flo System Inc. in March 2010, several of the areas above have already been connected to the WWTM. MPE's understanding is that these areas have continued to grow over the years and that additional development plans are in the works, which will define the amount of flow that will be coming from the overall area.



TWP 25 - RGE 28 - W4M



TWP 24 - RGE 28 - W4M

- STUDY AREA
- SANITARY CATCHMENT AREA
- HAMLET
- EXISTING SERVICE AREA
- PHASE 1
- PHASE 2
- LONG TERM DEVELOPMENT
- LIFT STATION - PROPOSED
- LIFT STATION - EXISTING
- SANITARY FORCEMAIN - EXISTING
- SANITARY GRAVITY MAIN - EXISTING
- SANITARY FORCEMAIN - PROPOSED
- SANITARY TRANSMISSION MAIN (ERVWWTM)



 <div>Rocky View County Cultivating Communities</div>	 <div>MPE a division of Englobe</div>	
	DATE: MAY 2024	SCALE: 1:35,000
CONRICH WASTEWATER SERVICING PLAN EXISTING AND COMMITTED WASTEWATER INFRASTRUCTURE AND PHASING	JOB: 2285-069-02	FIGURE: 2

## 2.2 Conrich Area Wastewater Servicing

### 2.2.1 Individual Lot Servicing

Historically, wastewater servicing in the Conrich area has been provided on a lot-by-lot basis. Private lots have typically been serviced with private on-site wastewater disposal systems, generally consisting of septic tank and tile field systems. A goal of the area is to avoid the continued use of private wastewater disposal systems; therefore, as connections to the WWTM become available, these private septic fields and tile systems should be abandoned and reclaimed as per Alberta Environment and Protected Areas (AEPA) and Municipal Affairs Guidelines.

### 2.2.2 South Conrich

Two developments (Prince of Peace and Cambridge Estates) within South Conrich are currently serviced by the WWTM. The development is connected via the Conrich Lateral Lift Station (LLS) and a 450 mm PVC forcemain, as shown on **Figure 2**. The LLS is located on the Cambridge Estates property (NE 29-24-28-W4M).

Based on data received from RVC, the flows (2010-2018) for the LLS are summarized in **Table 2.1**. This includes flows from the existing Cambridge Development and Prince of Peace.

**Table 2.1: Existing Capacities for the Conrich Lateral Lift Station (LLS)**

Year	Cambridge Annual Flows (m <sup>3</sup> /yr)	Prince of Peace Annual Flows (m <sup>3</sup> /yr)	Total <sup>[1]</sup> Annual LLS Flows (m <sup>3</sup> /yr)	Average Daily Flows (m <sup>3</sup> /d)	Average Flows (L/s)
2018	76,543	55,596	132,139	362	4.2
2017	71,223	50,977	122,200	335	3.9
2016	71,651	53,883	125,534	344	4.0
2015	60,909	57,363	118,272	324	3.8
2014	37,452	59,193	96,645	265	3.1
2013	23,667	62,905	85,512	234	2.7
2012	31,589	54,060	85,649	235	2.7
2011	26,195	63,974	90,169	247	2.9
2010	29,941	55,581	85,522	234	2.7

[1] Consists of wastewater flows from the Conrich Lateral Lift Station.

[2] Capacities beyond 2018 have been reviewed as part of the Balzac & Conrich Water & Wastewater Capacity Summary (DRAFT) technical memorandum, October 6, 2022.

Cambridge Estates consists of approximately one and a half quarter sections of residential development that are currently serviced with wastewater gravity mains to the existing LLS. Based on drawings provided by RVC, the LLS consists of a 3 x 4 m pre-cast concrete wet well that is approximately 9 m deep. This LLS consists of a prefabricated building (6.5 x 8.6 m) with two rooms situated over the wet well. One of the rooms provides access to the wet well and the second room is a mechanical room with control panels and a generator. There are provisions in the wet well for three pumps, whereas only two are currently installed.

The LLS with the current submersible pumps (two pumps – Flygt 3231) has a capacity of approximately 195 L/s. Should a third pump of similar size be added, the LLS would have an ultimate capacity of approximately 240 L/s. The forcemain from the lift station is a 450 mm PVC pipe that ties into the WWTM at Township Road 250. If using a velocity of 1.5 m/s within the forcemain, then the peak flow capacity would be approximately 240 L/s, matching the ultimate pumping capacity. Based on the flows received from RVC in **Table 2.1**, an average flow of 4.2 L/s was seen in 2018, as such there is capacity in the LLS for future development in this area.

Based on the *Conrich Area Structure Plan – May 2017*, the Prince of Peace area is approximately 147 gross acres with the population anticipated to increase in the future to approximately 3,507. This development is serviced by a lift station, which is located on the Prince of Peace property conveying wastewater to the LLS via a 200 mm HDPE forcemain and ties into a 350 mm gravity sewer upstream of Cambridge Estates.

Note that in the *Langdon WWTP Capacity Plan* (MPE, 2012), there is a large amount of Infiltration and Inflow (I & I) that has been attributed from the Prince of Peace development. Efforts are recommended to be put in place to monitor the I & I and complete maintenance and repairs as required.

### **2.2.3 Committed Servicing Agreements**

Within the Conrich area, RVC has committed to service three other developments. These are shown in **Figure 2** and include:

- Canadian National Railway (CN development).
- Buffalo Hills Development (Phase 1).
- Cambridge Park (Phase 4).



The CN development, consisting of 720 acres of land, is located on the north side of Township Road 250 as shown on **Figure 2**, east of Range Road 284 and is proposing to develop a regional transportation facility. As per the *Calgary Logistics Park at Conrich – A Master Development Plan* prepared by Brown and Associates Planning Group, AECOM, LA West and Stantec in 2011 (CN, 2011), the wastewater from this site connects to the WWTM at Township Road 250 through a lift station designed to service this development, as shown on **Figure 2**.

Buffalo Hills Development (SE33, NE28 and SE28, 24-28-W4M) is a 475-acre site shown on **Figure 2** and is proposed to be a mixed-use community of residential in the north two sections with business, institutional and some residential in the southernmost quarter section. As per our understanding, only Phase 1 has been approved by RVC at this time, which includes 142 residential lots and a school in the northern quarter section. Phase 1 encompasses approximately 100 acres. Based on the approved drawing for the Development Agreement, there is one lift station proposed in the northern quarter section which would be tied into the Conrich LLS via a 200 mm PVC forcemain.

As of December 5, 2023, the County has allocated an additional 124.46 m<sup>3</sup>/d for Cambridge Park Phase 4. This is an extension west of the existing first three phases of Cambridge Park.

### 2.3 Current and Projected Regional Flows

Commissioned by RVC, Sim-Flo Systems Inc. completed the *East Rockyview Regional Wastewater System Capacity Overview* (SF, 2010) in 2010 to assess the capacity of the WWTM. Based on this report:

- The WWTM is near capacity with the existing developments (not including infiltration).
- With infiltration (0.28 L/s/ha), the WWTM does not have capacity.
- The Langdon WWTP does not have capacity for the existing developments along the WWTM.
- Current capacity of the Regional Conrich Lift Station (two pumps) is 186 L/s, with an ultimate capacity (four pumps) of 495 L/s.
- Peak flows from the Regional Conrich Lift Station were estimated to be 149.1 L/s in 2010 when the report was completed.
- The Ultimate Phase 1 Average Sewage Flows for the WWTM was estimated to be approximately 382 L/s, with a Total Estimated Peak Flow of approximately 791 L/s.



In December 2012, MPE completed a *Langdon WWTP Capacity Plan* for RVC. The plan reviewed the treatment capacity of the existing Langdon WWTP. Key items of this report include:

- Design capacity of the WWTP is 4,300 m<sup>3</sup>/d.
- Average Day Flow of the WWTP is approximately 2,053 m<sup>3</sup>/d.
- WWTP capable of treating up to 4,950 m<sup>3</sup>/d in storm mode.
- Three-year peak day flow to the WWTP was 4,594 m<sup>3</sup>/d.
- There is significant I & I in the existing collection system.
- Peak amount of effluent to be discharged through Weed Lake was established at 6,800 m<sup>3</sup>/d.

Based on *C-8009-2020 Regional Water and Wastewater Off-site Levy Bylaw*, the Langdon WWTP consists of a Sequential Batch Reactor (SBR) treatment plant with UV disinfection. Upgrades are proposed to bring the capacity up to a target of 8,000 m<sup>3</sup>/day average day flow.

## 2.4 Regional System Limitations

It is understood that the RVC's target upgrade average day capacity for both the Langdon WWTP and WWTM is 8,000 m<sup>3</sup>/d. As of December 31, 2022, RVC has committed capacities of 5,070 m<sup>3</sup>/d for the Langdon WWTP and 3,244 m<sup>3</sup>/d for the WWTM.

As will be discussed in the following sections, the Conrich area could see average flows of approximately 15,000 m<sup>3</sup>/day of wastewater during Phase 1 and an additional 15,000 m<sup>3</sup>/day of wastewater during Phase 2, for a total of 30,000 m<sup>3</sup>/day at full build-out. The above commitments and the following items should be taken into account when approving developments in the Conrich area or other areas along the WWTM:

- Upgrades to the Langdon WWTP are required prior to full build-out. It is understood that the current plant is having difficulty keeping up with the wastewater flows in wet weather events due to I & I, and that upgrades to meet a capacity of 8,000 m<sup>3</sup>/d are being considered.
- Currently, the WWTP discharges effluent to Weed Lake. The peak allowable amount is 6,800 m<sup>3</sup>/day. This will not be sufficient to support the full build-out of the Conrich area.
- From our understanding, the ultimate plan for the WWTM is to eventually twin the 600 mm forcemain with a second 600 mm forcemain. Additional forcemain capacity will be required prior to full build-out.

### 3.0 PROJECTED DESIGN PARAMETERS

#### 3.1 Land Use

The Conrich Wastewater Servicing Plan will examine servicing the 30-year buildout as per the Draft Land Use Plan provided by RVC from the 2023 Draft Conrich ASP (**Appendix A-1**). Note that the land use map was updated by RVC in April 2024 and is included in **Appendix A-2**. Using a phased approach, RVC has proposed three development milestones: Phase 1, Phase 2, and Long-term Development. The proposed infrastructure discussed in the following sections was assessed for Phases 1 and 2.

The Draft Land Use Plan provided by RVC was used to establish build-out wastewater flows. It is estimated that with the proposed land use, there would be approximately 15,000 m<sup>3</sup>/d of wastewater flow in Phase 1 and up to 30,000 m<sup>3</sup>/d of wastewater flow once Phase 2 is developed (**Appendix B**). The parameters used to calculate the flows are discussed in the following sections.

#### 3.2 Projected Water Demand Design Parameters

The projected water demands were calculated based on assumptions shown in **Table 3.1**. These parameters were proposed in the *Conrich Potable Water Network Plan – Revision 4* which MPE has prepared simultaneously with this report. The calculated water demands were then used to project the wastewater flows.

**Table 3.1: Water Demand Design Parameters**

Parameter	Value
Industrial and Commercial Consumptive Use (ADD) <sup>[1]</sup>	3.4 m <sup>3</sup> /day/gross acre
Population Density <sup>[2]</sup>	1.8 to 2.7 persons/household
Unit Density <sup>[2]</sup>	0.4 to 13.1 units/acre
Water Demand per Capita <sup>[3]</sup>	340 L/capita/day

[1] Based on the average ADD per area used for the Balzac Master Potable Water Plan as completed by MPE in 2012. Note that this value is less than the 0.15L/s/gross hectare in the 2013 County Servicing Standards, Approved By Resolution No. 188-13 on May 28, 2013.

[2] Based on the draft land use strategy as attached in **Appendix A-1**. Note that the unit density value has been applied to the Gross Acre rather than the Net Acre to be conservative.

[3] Based on the 2013 County Servicing Standards, Approved By Resolution No. 188-13 on May 28, 2013.

### 3.3 Wastewater Flow Design Parameters

Using the design parameters outlined in **Section 3.2**, estimated wastewater flows for the future development of the Conrich area were established.

The projected wastewater flows were calculated based on the following assumptions:

- Wastewater flow is 90% of the Average Day Water Demand.
- I & I rate is 0.1 L/s/ha.
  - AEPA recommends an infiltration rate of 0.28 L/s/ha. Typically, this rate tends to be conservative for new developments. Utilizing previous design parameters including the Campus at *East Balzac Water and Wastewater Servicing Plan* (MPE 2010), an intermediate I & I rate of 0.1 L/s/ha has been used for the development due to modern techniques and materials for reducing infiltration. Therefore, an I & I rate of 0.1 L/s/ha has been adopted for this plan.
- Peaking factor varies in each sanitary catchment area from 3 to 5.
  - As per *Wastewater Systems Guidelines for Design, Operating and Monitoring*, prepared by Alberta Environment and Sustainable Resource Development, March 2013 (ESRD, 2013), the Harmon's Peaking Factor calculation is recommended to determine the residential peaking factor and  $Pf = 6.659(Q_{AVG}^{-0.168})$  for commercial and industrial land. As Conrich is a mixed-use area, the commercial and industrial formula is used to provide a more conservative flow.

## 4.0 CONRICH AREA WASTEWATER SERVICING

### 4.1 General

RVC anticipates growth demand will continue in the region and would like to focus on the Conrich area. As such, existing wastewater infrastructure and committed developments have been reviewed to develop a conceptual plan for this area.

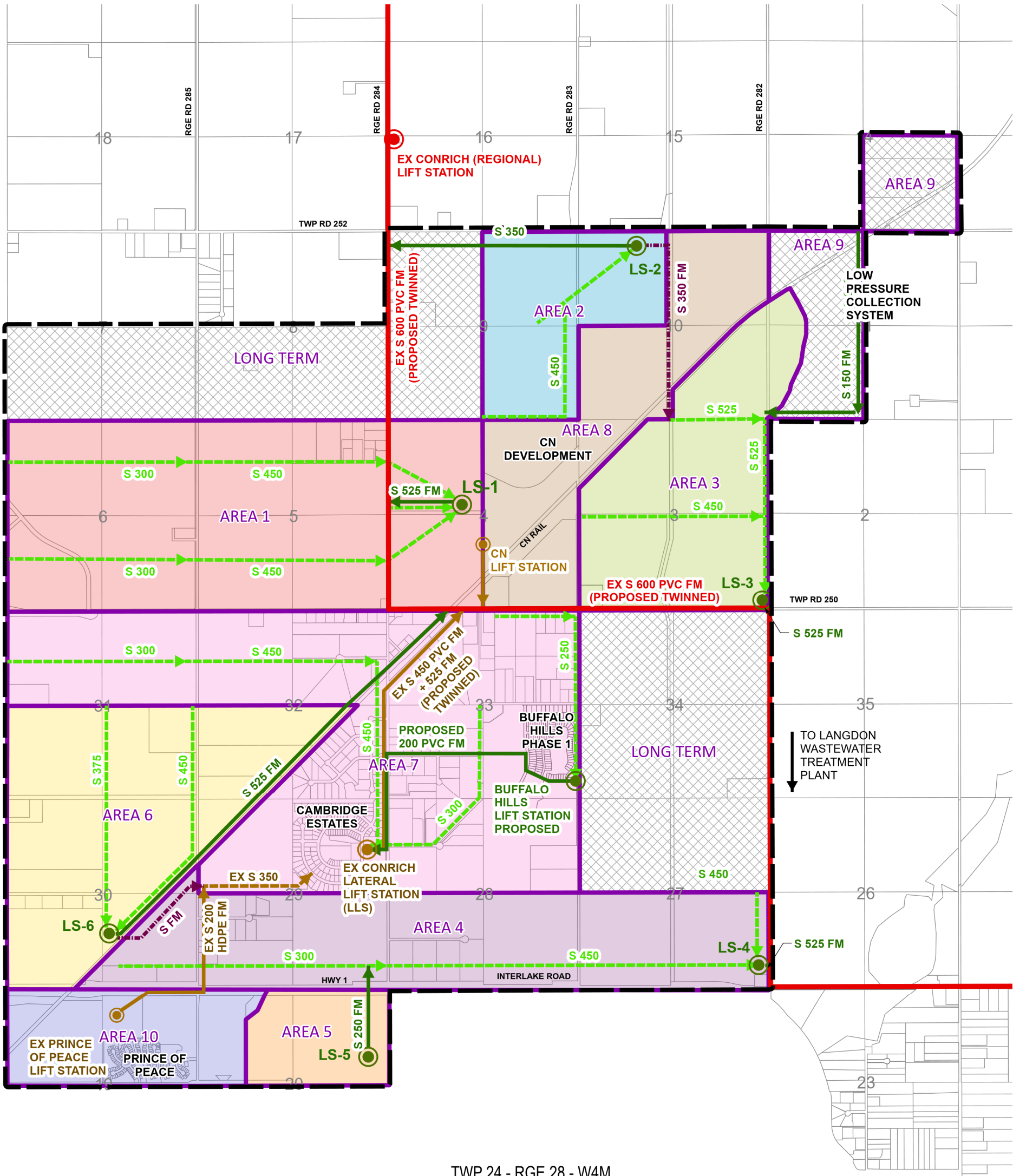
### 4.2 Proposed Wastewater Servicing

The plan area was divided into nine servicing areas, as shown in **Figure 3**. These areas were determined based on topography, slope of land, phasing, connection to the WWTM, existing infrastructure (i.e. LLS), and approved developments (i.e. CN). It is proposed that each servicing area consist of gravity collection mains that transport the flows from future developments to a lateral lift station in each area. Area 9 is the exception, due to the flat nature of the area and its location in the extreme northeast of the study area; it is proposed that a low pressure collection system be designed which would tie into a lateral lift station. The lateral lift stations would require to be connected to the WWTM via a forcemain.

The proposed gravity mains were sized using AEPA's municipal wastewater guidelines:

- Required Sewer Capacity was determined by using the estimated design flow divided by 0.86.
- Manning's Equation was used to calculate the diameter of the gravity mains.
- Roughness Coefficient of 0.013 was used for PVC pipe.
- Minimum cover of 2.5 m.
- Maximum cover of 6 m was respected.

Applying the above design parameters, the gravity collection mains vary from 300 to 525 mm in diameter with smaller collection mains within the developments. The gravity mains have been located along the boundaries of the quarter sections as there are currently no development details for the majority of the areas. For grading purposes, the developers will need to keep in mind that there are minimal slopes in some areas.



- STUDY AREA
- LIFT STATION - PROPOSED
- LIFT STATION - EXISTING
- SANITARY GRAVITY MAIN - PROPOSED
- SANITARY FORCEMAIN - PROPOSED
- SANITARY FORCEMAIN - INTERIM / ALTERNATE
- SANITARY FORCEMAIN - EXISTING
- SANITARY GRAVITY MAIN - EXISTING
- SANITARY TRANSMISSION MAIN



ROCKY VIEW COUNTY  
Cultivating Communities



a division of Englobe

CONRICH WASTEWATER SERVICING PLAN - OPTION 1  
PROPOSED FUTURE WASTEWATER  
INFRASTRUCTURE

DATE:	MAY 2024	SCALE:	1:35,000
JOB:	2285-069-02	FIGURE:	3

The proposed lateral lift stations were located in the low areas of each of the servicing areas. To minimize the number of small lift stations, some grading may be required as part of the development design and should be coordinated with the developers. The conceptual design of the lateral lift stations, which is consistent with the Conrich LLS, consists of:

- Cast-in-place concrete wet well.
- Provision for three submersible pumps.
- A pre-fabricated building with two rooms: one for lift station access and a second room for controls and a generator.
- Forcemain to connect to the WWTM.
- Forcemain sized to have a minimum of 0.6 m/s with a target of approximately 1 m/s.

Due to the location of Area 9, to eliminate multiple lift stations in the area, a low pressure collection system is proposed. Each industrial/commercial lot would be responsible for pumping wastewater flows from the individual lots to the central forcemain.

### 4.3 Options

Two wastewater servicing options were evaluated for the Conrich Study Area. The wastewater servicing areas remain the same in the two options with one main lateral lift station per area.

For Option 1, each of the lateral lift stations connect directly to the WWTM. For Option 2, only three large lateral lift stations are proposed to be tied into the WWTM, with the other lateral lift stations flowing to one of the three larger lift stations. The design parameters of the lateral lift station infrastructure and force mains for the two Options are included in **Table 4.1**.

With Option 2, as there are fewer connections to the WWTM, the lift stations connecting to the WWTM will be larger and operational costs will increase due to double pumping of the wastewater. For two of the three lateral lift stations in Areas 1 and 4, large lift stations similar to the regional in-line lift stations would be required. These consist of a wet and dry well with provisions for four pumps, as well as a large pre-fabricated building with a generator and controls.

Area 7, which already has a lateral lift station, will require upgrading to accommodate future flows. This may consist of additional on-site storage.

**Table 4.1 Proposed Wastewater Infrastructure**

	Option 1							
	Phase 1		Phase 2		Approx. Depth of Wet Well (m)	Forcemain Size (mm)	Forcemain Length (m)	Number of Pumps <sup>[4]</sup>
Area	Contributing Area (Acres)	Required Capacity (L/s)	Contributing Area (Acres)	Required Capacity (L/s)				
1	630	114	1650	259	9	525	750	3
2	0	0	482	90	7	350	2300	3
3 <sup>[3]</sup>	316	63	1214	219	9	525	50	3
4 <sup>[7]</sup>	0	0	1271	223	9	525	50	3
5	0	0	217	45	6	250	600	3
6	529	119	1169	214	9	525	4000	3
7 <sup>[1]</sup>	2025	389	2178	403	9	450+525	2300	3
8 <sup>[2]</sup>	360	70	720	128	n/a	n/a	n/a	n/a
9	0	0	442	84	n/a	n/a	n/a	n/a

	Option 2							
	Phase 1		Phase 2		Approx. Depth of Wet Well (m)	Forcemain Size (mm)	Forcemain Length (m)	Number of Pumps <sup>[4]</sup>
Area	Contributing Area (Acres)	Required Capacity (L/s)	Contributing Area (Acres)	Required Capacity (L/s)				
1 <sup>[6]</sup>	630	114	2132	349	10	2x450	750	4
2	0	0	482	90	7	350	3600	3
3 <sup>[3]</sup>	316	63	1214	219	9	525	50	3
4 <sup>[5,7]</sup>	0	0	2440	437	10	2x525	50	4
5	0	0	217	45	6	250	600	3
6	529	119	1169	214	9	525	300	3
7 <sup>[1]</sup>	2025	389	2178	403	9	450 + 525	2300	4
8 <sup>[2]</sup>	360	70	720	128	n/a	n/a	n/a	n/a
9	0	0	442	84	n/a	n/a	n/a	n/a

**Notes:**

- [1] Current Capacity of Conrich LLS is 195 L/s based on "WWTM Capacity Overview" Report completed by Sim-Flow Systems Inc. for RVC on March 11, 2010 (SF 2010).
- [2] Projected flows based on the *CN Calgary Logistics Park at Conrich - A Master Site Development Plan for a Customer Warehouse Development prepared in 2001 (CN2011)*.
- [3] Includes Area 9
- [4] Number of pumps includes one additional standby pump.
- [5] Includes Area 6
- [6] Includes Area 2
- [7] Includes Area 5



#### 4.4 Development Phasing Options

The proposed phasing with respect to the wastewater system was determined based on existing infrastructure and developments that have been committed to by RVC. As such, it is proposed that the servicing areas be developed in the following order:

**1. Wastewater Area 7**

- Existing Conrich LLS and connection to WWTM.
- Approved Buffalo Hills Development.
- Existing Water Infrastructure.
- Potential to expand existing water and wastewater infrastructure.

**2. Wastewater Area 8**

- Committed CN development.

**3. Wastewater Area 3**

- Potential to expand existing wastewater infrastructure.
- Existing Water Infrastructure.
- Potential development due to CN.

**4. Wastewater Areas 1 and 2**

- Potential development due to CN.
- Potential to expand existing infrastructure.

**5. Wastewater Area 4 and 6**

- No existing infrastructure in the immediate area.

**6. Wastewater Area 5 and 9**

- No existing infrastructure in the immediate area.
- Due to location and distance will require other infrastructure to be developed first.

Proposed phasing as per the most recent land use map is shown on **Figure 2**. The RVC phasing is consistent with the proposed wastewater phasing in that the initial focus area is the Hamlet of Conrich. Ideally for development of the infrastructure, it is proposed that one area is developed at a time rather than portions of each area. Should portions be developed, then interim connections and/or infrastructure may be required.

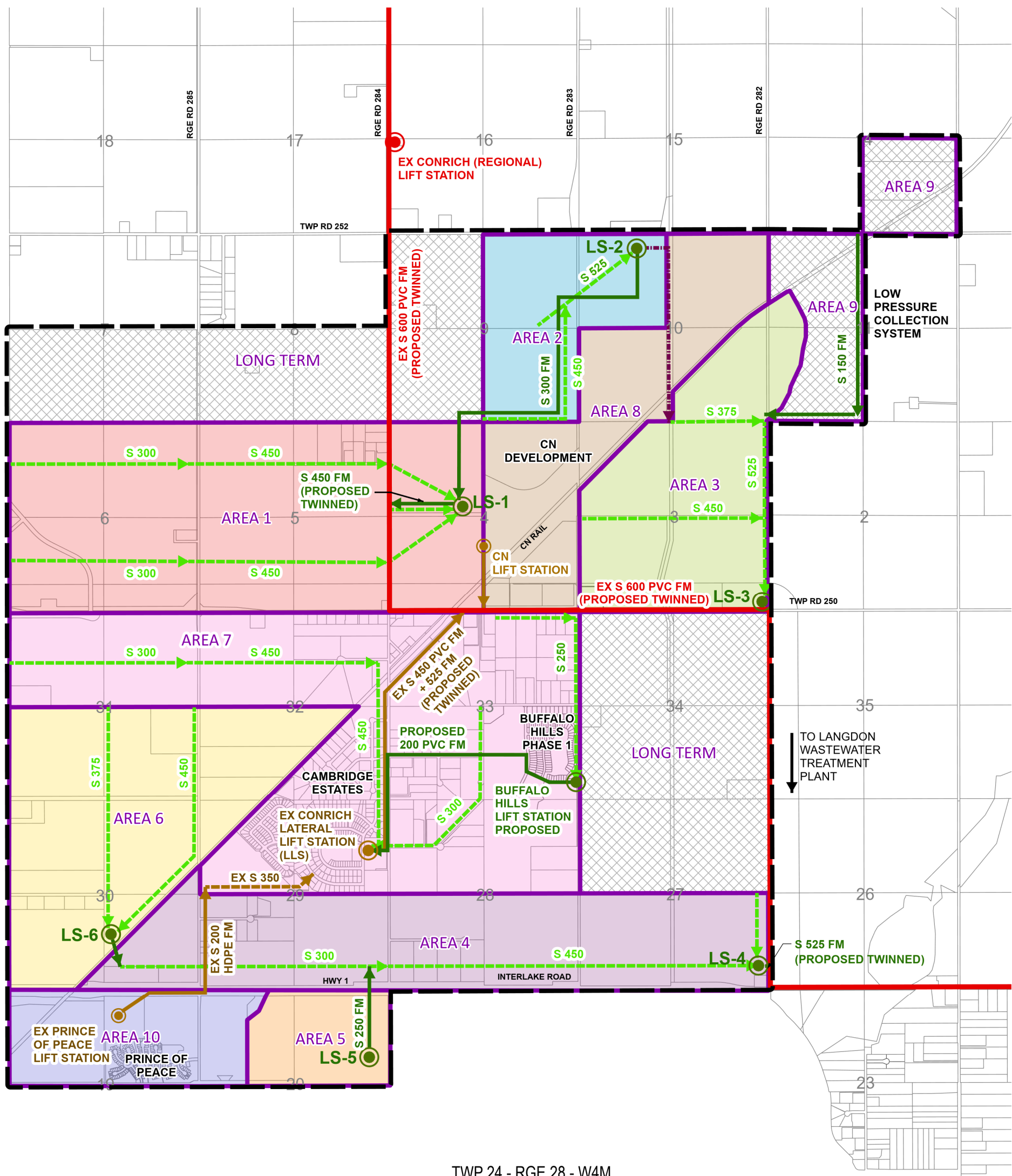
#### **4.4.1 Interim Routing**

Should RVC have interest in developing other areas prior to those listed previously, there are alternatives that could be considered in the interim. These options are shown on **Figure 3**.

Currently, Areas 2 and 3 are on either side of Area 8 (CN Development) and consist of separate lift stations, as shown in **Table 4.1**. These areas could potentially be combined by crossing through Area 8 from Area 2 to Area 3. This would reduce the number of connections to the WWTM and may give some flexibility in the sections to be developed first.

Should RVC have some interest in partially developing Area 6, a possible interim connection could be made to Area 7 or Area 4. For connection to Area 7, this would include crossing the CN tracks and tying into the existing gravity main where the Prince of Peace forcemain ties into the system. For connection to Area 4, a CN crossing would also be required prior to tying into the proposed future gravity main to LLS #4.

TWP 25 - RGE 28 - W4M



TWP 24 - RGE 28 - W4M

- STUDY AREA
- SANITARY CATCHMENT AREA
- LIFT STATION - PROPOSED
- LIFT STATION - EXISTING
- SANITARY GRAVITY MAIN - PROPOSED
- SANITARY FORCEMAIN - PROPOSED
- SANITARY FORCEMAIN - EXISTING
- SANITARY GRAVITY MAIN - EXISTING
- SANITARY FORCEMAIN - INTERIM / ALTERNATE
- SANITARY TRANSMISSION MAIN



ROCKY VIEW COUNTY  
Cultivating Communities



a division of Englobe

CONRICH WASTEWATER SERVICING PLAN - OPTION 2  
PROPOSED FUTURE WASTEWATER  
INFRASTRUCTURE

DATE:	MAY 2024	SCALE:	1:35,000
JOB:	2285-069-02	FIGURE:	4

## 5.0 CAPITAL AND OPERATIONAL COSTS

This section reviews the capital expenditures and operational costs associated with providing wastewater infrastructure to the Conrich Servicing Area.

For the purposes of this plan, capital costs for the wastewater collection system including lateral lift stations and forcemains are assumed to be financed by RVC and recovered by development levy. Developers are assumed to be responsible for costs of gravity collection systems up to a diameter of 300 mm. The cost difference between 300 mm diameter pipes and larger pipes is assumed to be covered by RVC and recovered through the development levy.

### 5.1 Wastewater Infrastructure Capital Costs

Capital costs provided in **Table 5.1** are based on a conceptual level opinion of probable costs only. Actual expenditures will require further refinement once land use has been finalized and during preliminary design. These costs include a 25% Contingency Allowance and a 15% Engineering Allowance. Land acquisition, easements costs and operational costs are not included. Detailed Opinions of Probably Cost are included in **Appendix C**.

**Table 5.1: Wastewater Infrastructure Capital Costs**

	Infrastructure Costs (\$)	Average Day Flows (m <sup>3</sup> /day)	Cost/Avg Day Flow (\$/m <sup>3</sup> /d)
<b>Total Option #1</b>	32,100,000	29,230	1,098.19
<b>Total Option #2</b>	32,400,000	29,230	1,108.45

### 5.2 Wastewater Operational Costs

As operator of the wastewater system, RVC will be responsible for the following operational cost:

- Labour – An Operator will be required to maintain and monitor the lift stations, forcemains and gravity mains on an ongoing basis.
- Utility Costs – Power will be required to operate the mechanical equipment in the lift stations. Heating may be provided via power or gas connection and water will also be required for regular maintenance of the lift stations.

- Annual Maintenance – Regular maintenance of the lift stations, forcemains and gravity mains should be completed to ensure the infrastructure is operating as designed and to help prevent emergency situations.

### 5.3 Off-site Levy Costs

The costs presented previously in **Table 5.1** were calculated for the local Conrich area infrastructure only. In addition to these costs, developers in the area will require to pay off-site levies for upgrades to the Langdon WWTP and for the East Rocky View Regional WWTM. These current costs are included in the Rocky View County *Off-Site Levies for Regional Water and Wastewater Facilities* (Bylaw No. C-8009-2020). The costs of the levies are reflected in **Table 5.2**.

**Table 5.2: Off-Site Levy Wastewater Costs**

Wastewater Infrastructure	Levy (\$/m <sup>3</sup> /day)
Langdon Wastewater Treatment Plant	\$ 8,437.88
East Rocky View Regional Transmission Main	\$ 7,599.49
Conrich Infrastructure – Option 1	\$ 1,098.19
<b>Total Levy</b>	<b>\$17,135.56</b>

## 6.0 CONCLUSIONS

The Conrich Area is part of a regional system, which consists of the WWTM that runs from the Balzac area south to Langdon. The wastewater flows are treated at the Langdon WWTP.

### Wastewater Servicing

The Conrich Servicing Area provided by RVC has been divided into nine wastewater servicing areas. These areas consist mainly of gravity mains (300 to 525 mm diameter) conveying wastewater towards low-lying areas in proximity to the WWTM. The exception to this is Area 9 where a Low Pressure Collection System is proposed due to the flat nature of the land and location, as well as to eliminate multiple lift stations. Lateral lift stations with forcemains would tie into the WWTM.

**Option 1** – This option consists of one lateral lift station and WWTM connection for each servicing area. These proposed lateral lift stations were assumed to be consistent in design with the existing Conrich LLS. Depth of wet well, pumps, and forcemain sizing vary and were determined according to the land use and servicing area. It is proposed the wet wells and buildings be designed to accommodate for the Long-term Development of the area.

**Option 2** – This option looks at reducing the number of connections to the WWTM. Four smaller lateral lift stations are proposed to connect to three larger lift stations which would tie into the WWTM. The proposed four smaller lateral lift stations were assumed to be consistent in design with the existing Conrich LLS. The two proposed larger lift stations located in Servicing Areas 1 and 4 were assumed to be consistent in design to the in-line regional lift stations. The existing Conrich LLS would also require upgrading. It is proposed the wet wells and buildings be designed to accommodate Long-term Development.

The land use in this area is not finalized; therefore, any changes in land use should be considered when assessing the proposed wastewater infrastructure.

### Wastewater Phasing

Initial phasing of the Conrich area is recommended in areas where there is existing infrastructure or where RVC has already approved development, which is consistent with the proposed RVC phasing. Following the initial development, it is proposed that RVC develop those areas where infrastructure can be more readily expanded.

### Wastewater Capital Costs

**Option 1** – A conceptual level opinion of probable cost shows that to develop the major wastewater infrastructure, a total cost of approximately \$32,100,000 would be required.

**Option 2** – Due to the larger lift stations and more forcemains required in this option, a total cost of infrastructure is approximately \$32,400,000.

These costs are assumed to be financed by RVC and levies would be applied to developers.

As per the RVC bylaw C-7273-2020, the Conrich area would be subject to levies associated with the Langdon WWTP (\$8,437.88/m<sup>3</sup>/day) and for the East Rocky View WWTM (\$7,599.49/m<sup>3</sup>/day). This is in addition to levies that are being proposed in this report to cover the costs of the local Conrich Area Wastewater Infrastructure (Option 1 – \$1,098.19, Option 2 – \$1,108.45).

### Regional Servicing

RVC has undertaken studies that have assessed the current capacity of the Regional Wastewater System and the Langdon Wastewater Treatment Plant. Prior to full build-out in this area, the WWTM and the Langdon WWTP will require upgrades to accommodate the additional flows generated by this servicing area. These upgrades will need to take into account the entire regional system.

## **7.0 RECOMMENDATIONS**

1. During detailed design of the lift stations, it is recommended that an assessment be completed on the lift stations currently in-line on the Regional WWTM and those connected to the WWTM in the Conrich area to determine if the addition of new lift stations significantly impacts the operation of the existing WWTM system. As more lift stations are added, there may be a greater impact on the existing system.
2. RVC should complete further assessment of I & I and take measures to control I & I to achieve maximum capacity out of the existing system. This flow could greatly affect the capacity of the wastewater infrastructure in the area.



## 8.0 REFERENCES

1. Brown, 2006. *"Buffalo Hills Comprehensive Development Conceptual Scheme SE 33, NE 28, and SE 28, Tp24-Rge28-W4M"*, prepared by Brown and Associates Planning Group for Spearpoint Holdings Ltd., Adopted July 11, 2006.
2. CN, 2011. *"CN Calgary Logistics Park at Conrich - A Master Site Development Plan for a Customer Warehouse Development"*, prepared by Brown and Associates Planning Group, AECOM, LA West and Stantec for CN, March 2011.
3. ESRD, 2013. *"Part 4 - Wastewater Systems Guidelines for Design, Operating and Monitoring"*, prepared by Alberta Government, March 2013.
4. MDRV, 2000. *"Balzac East Area Structure Plan"*, prepared by Municipal District of Rocky View No. 44, Department of Planning and Development, Bylaw C-5177-2000, Adopted September 26, 2000.
5. MDRV, 2004. *"Calgary-Chestermere Corridor Area Structure Plan"*, prepared by Municipal District of Rocky View No. 44, Schedule "A" to Bylaw C-5980-2004, December 2004.
6. MDRV, 2006. *"South Conrich Conceptual Scheme"*, prepared by Municipal District of Rocky View No. 44, Department of Planning and Development, Bylaw C-6401-2006, Adopted July 31, 2007.
7. MH, 2005. *"East Rocky View Regional Utility Servicing, Lateral Lift Stations Conceptual Design"*, prepared by Morrison Hershfield, presented to the Municipal District of Rocky View No. 44, November 24, 2005.
8. MPE, 2010. *"Campus at East Balzac Water and Wastewater Servicing Plan"*, prepared by MPE Engineering Ltd. for Rocky View County, February 2010.
9. MPE, 2012. *"Langdon WWTP Capacity Plan"*, prepared by MPE Engineering Ltd. for Rocky View County, December 2012.
10. MPE, 2017. *"OMNI Area Structure Plan: Servicing Strategy"*, prepared by MPE Engineering Ltd. For Rocky View County, August 21, 2017.
11. RVC 2017. *"Conrich Area Structure Plan"*, prepared Rocky View County, Approved December 8, 2015, Bylaw C-7468-2015, amended May 10, 2017 by MGB Order 020/17.
12. RVC, 2020. *"Regional Water Wastewater Off Site Levy Bylaw"*, prepared by Rocky View County, Approved June 9, 2020, Bylaw C-8009-2020.
13. SF, 2010. *"East Rockyview Regional Wastewater System Capacity Overview"*, prepared by Sim-Flow Systems Inc. for the County of Rockyview, March 11, 2010.

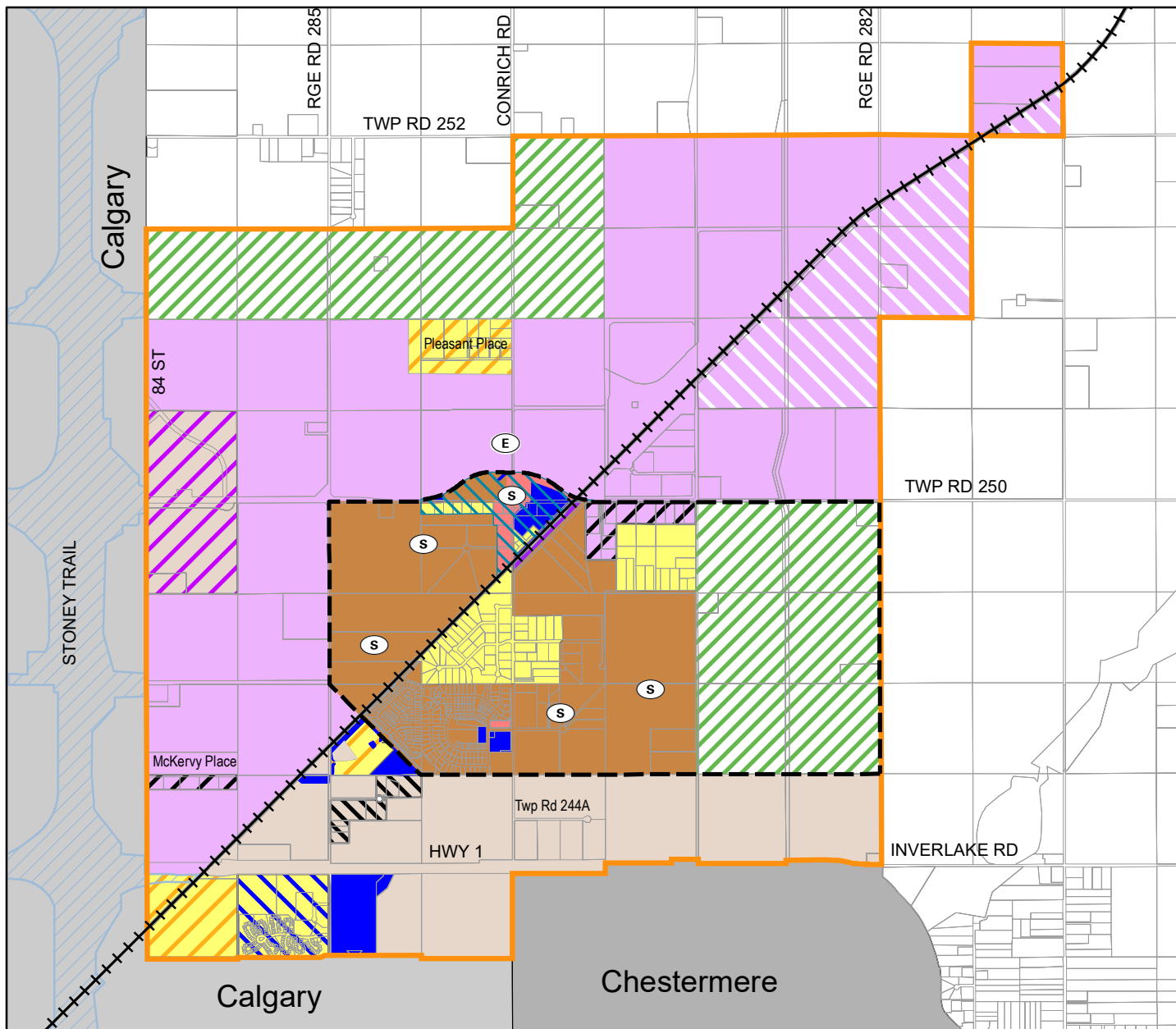
## **APPENDIX A-1**

---

Conrich ASP Land Use Maps from RVC - 2023

2023 Revision (Superseded)

Map 5:  
Land Use Strategy



- ASP Boundary
- Future Policy Area
- Country Residential
- Residential-form to be determined
- Hamlet Residential
- Hamlet Commercial
- Institutional/Residential
- Institutional
- Industrial
- Heavy Industrial
- Industrial Transition
- Highway Business/Industrial
- Highway Business
- Highway Business Transition
- Long Term Development Area
- Community Core
- Emergency Services
- School
- Transportation and Utility Corridor
- CN Railway

0 0.25 0.5 1 1.5 2  
Km

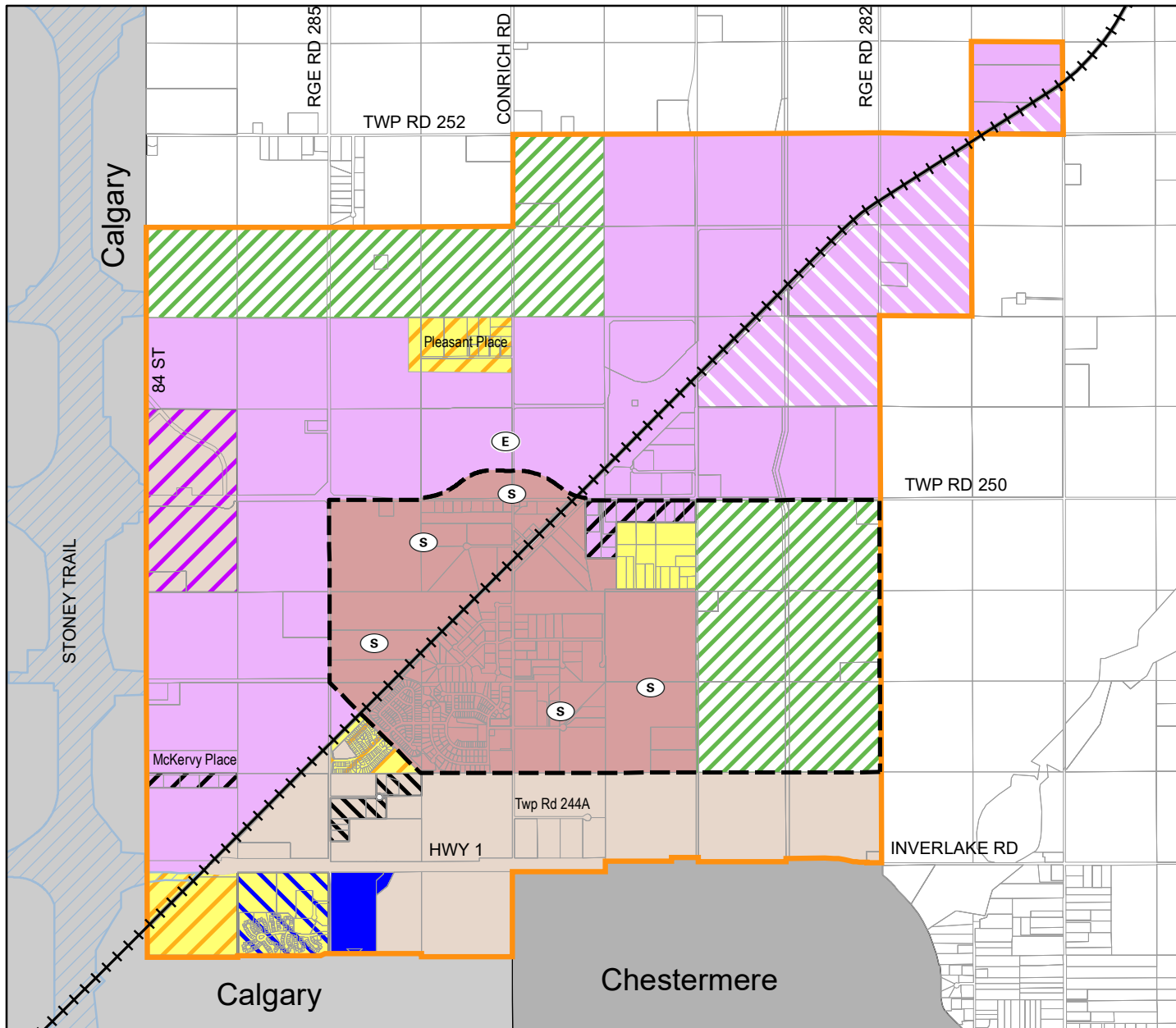


## **APPENDIX A-2**

---

Conrich ASP Land Use Maps from RVC - 2024

## Map 5: Land Use Strategy

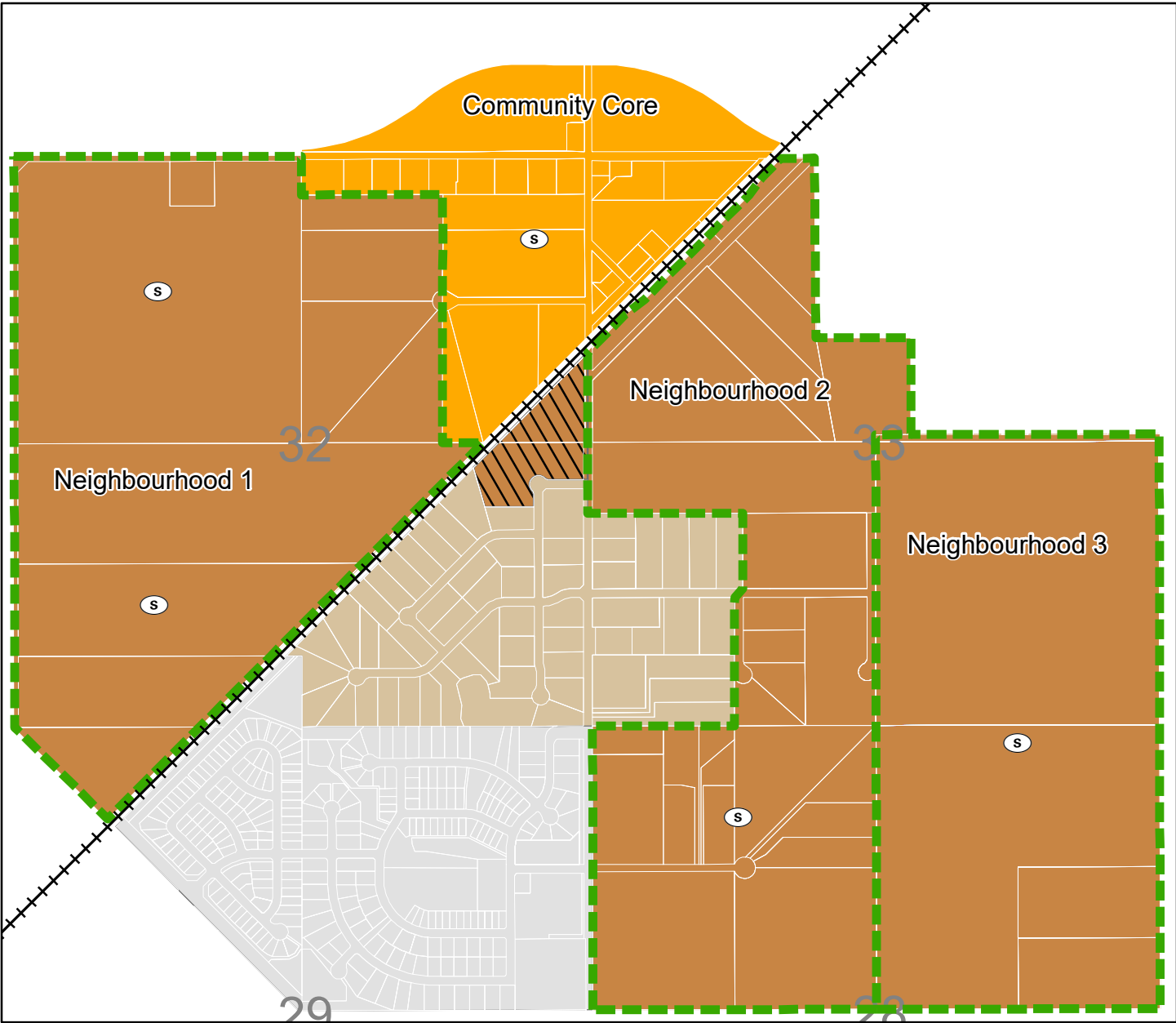


- ASP Boundary
- Future Policy Area
- Country Residential
- Residential-form to be determined
- Hamlet Policy Area
- Institutional/Residential
- Institutional
- Industrial
- Heavy Industrial
- Industrial Transition
- Highway Business/Industrial
- Highway Business
- Highway Business Transition
- Long Term Development Area
- Emergency Services
- School
- Transportation and Utility Corridor
- CN Railway

0 0.25 0.5 1 1.5 2  
Km



Map 6:  
Hamlet Policy Area



- Neighbourhood Residential
- Neighbourhood Residential Transition
- Existing Country Residential
- Cambridge Park
- Community Core
- Neighbourhood Areas
- S School
- ++++ CN Railway

## **APPENDIX B**

---

### Wastewater Flows

Appendix B  
Land Use and Wastewater Demands

Wastewater Area	Proposed Land Use	Total Gross Area from GIS	Total Gross Area from GIS	Phase 1		Phase 2		Infiltration	Phase 1 AVG Water Demand	Phase 1 + 2 AVG Water Demand	Phase 1 AVG WW Flow Rate	Phase 1 Peaking Factor	Phase 1 Peak Design Flow Rate	Phase 1 + 2 AVG WW Flow Rate	Phase 1 + 2 Peaking Factor	Phase 1 + 2 Peak Design Flow Rate
		Hectares	Acres	%	Acres	%	Acres	m3/day <sup>(4)</sup>	m3/day	m3/day	m3/day		m3/day	m3/day		m3/day
1	Highway Business - Industrial	61.7	152.5	100%	152.5	0%	0.0	533	518	518	467			467		
	Hamlet Master Planned Residential/Institutional - updated Jun 2023	8.9	22.0	100%	22.0	0%	0.0	77	81	81	73			73		
	Industrial	537.5	1328.2	31%	413.7	69%	914.4	4644	1407	4516	1266			4064		
	Residential Form to be Determined - Assumed Low Density	42.9	106.0	0%	0.0	100%	106.0	371	0	198	0			178		
	Hamlet Institutional/Industrial - updated 2023	12.1	29.9	100%	29.9	0%	0.0	105	102	102	91			91		
	Institutional	3.9	9.6	100%	9.6	0%	0.0	34	33	33	29			29		
	Institutional	0.7	1.7	100%	1.7	0%	0.0	6	6	6	5			5		
		667.7	1649.9		629.5		1020.4	5769	2146	5453	1932	4.0	9833	4907	3.4	22347
2	Industrial	195.0	481.8	0%	0.0	100%	481.8	1685	0	1638	0			1474		
		195.0	481.8		0.0		481.8	1685	0	1638	0	0.0	0	1474	4.1	7781
3	Heavy Industrial	184.4	455.7	0%	0.0	100%	455.7	1593	0	1549	0			1394		
	Industrial	128.0	316.3	100%	316.3	0%	0.0	1106	1075	1075	968			968		
		312.4	771.9		316.3		455.7	2699	1075	2625	968	4.4	5401	2362	3.8	11722
4	Highway Business	46.3	114.3	0%	0.0	100%	114.3	400	0	389	0			350		
	Highway Business	6.4	15.9	0%	0.0	100%	15.9	55	0	54	0			49		
	Highway Business Transition	8.1	20.1	0%	0.0	100%	20.1	70	0	68	0			62		
	Highway Business Transition	12.2	30.1	0%	0.0	100%	30.1	105	0	102	0			92		
	Highway Business	89.7	221.6	0%	0.0	100%	221.6	775	0	754	0			678		
	Highway Business	251.0	620.2	0%	0.0	100%	620.2	2169	0	2109	0			1898		
	Highway Business	2.9	7.2	0%	0.0	100%	7.2	25	0	24	0			22		
	Institutional	2.1	5.2	0%	0.0	100%	5.2	18	0	18	0			16		
	Highway Business	7.8	19.3	0%	0.0	100%	19.3	67	0	66	0			59		
		426.5	1054.0		0.0		1054.0	3719	0	3583	0	0.0	0	3225	3.6	15410
5	Highway Business	87.7	216.7	0%	0.0	100%	216.7	758	0	737	0			663		
		87.7	216.7		0.0		216.7	758	0	737	0	0.0	0	663	4.7	3892
6	Neighbourhood Residential	78.0	192.7	100%	192.7	0%	0.0	674	1283	1283	1154			1154		
	Industrial Transition	11.1	27.4	0%	0.0	100%	27.4	96	0	93	0			84		
	Industrial	383.9	948.6	35.4%	336.2	64.6%	612.4	3317	1143	3225	1029			2903		
		473.0	1168.8		528.9		639.9	4087	2426	4601	2183	3.9	10300	4141	3.5	18481
7	Country Residential	41.6	102.8	100%	102.8	0%	0.0	359	192	192	172			172		
	Industrial Transition	27.4	67.7	100%	67.7	0%	0.0	237	230	230	207			207		
	Neighbourhood Residential	112.3	277.5	100%	277.5	0%	0.0	970	1847	1847	1662			1662		
	Institutional/Industrial - updated 2023	4.3	10.6	100%	10.6	0%	0.0	37	36	36	33			33		
	Institutional/Residential	3.4	8.5	100%	8.5	0%	0.0	30	29	29	26			26		
	Residential Form to be Determined - Assumed Low Density	59.8	147.8	0%	0.0	100%	147.8	517	0	275	0			248		
	Institutional/Residential (Includes Existing Prince of Peace)	59.4	146.8	100%	146.8	0%	0.0	513	1177	1177	1059			1059		
	Highway Business - Industrial	64.8	160.1	100%	160.1	0%	0.0	560	544	544	490			490		
	Institutional/Residential	6.5	16.1	100%	16.1	0%	0.0	56	7	7	7			7		
	Institutional/Residential	2.7	6.7	100%	6.7	0%	0.0	23	23	23	20			20		
	Country Residential - Meadow Ridge	78.6	194.2	100%	194.2	0%	0.0	679	66	66	59			59		
	Cambridge Park	64.0	158.1	100%	158.1	0%	0.0	553	232	232	209			209		
	Neighbourbood 2 - Hamlet Residential	148.6	367.2	100%	367.2	0%	0.0	1284	2444	2444	2199			2199		
	Neighbourhood 3 - Hamlet Residential	129.6	320.2	100%	320.2	0%	0.0	1120	2131	2131	1918			1918		
	Hamlet Institutional	1.2	2.9	100%	2.9	0%	0.0	10	10	10	9			9		
	Institutional	31.1	77.0	100%	77.0	0%	0.0	269	262	262	235			235		
	Hamlet Institutional	3.7	9.0	100%	9.0	0%	0.0	32	31	31	28			28		
	Hamlet Commercial	1.3	3.1	100%	3.1	0%	0.0	11	11	11	10			10		
	Institutional	8.8	21.7	100%	21.7	0%	0.0	76	74	74	67			67		
	Institutional - South Conrich Cell D	8.0	19.8	100%	19.8	0%	0.0	69	67	67	60			60		
	Residential - South Conrich Cell D	17.2	42.5	100%	42.5	0%	0.0	149	140	140	126			126		
	Highway Business - South Conrich Cell D	2.1	5.2	0%	0.0	100%	5.2	18	0	18	0			16		
	Hamlet Commercial	5.1	12.6	100%	12.6	100%	12.6	44	43	43	39			39		
		881.5	2178.3		2025.3		165.6	7616	9596	9889	8637	3.1	33614	8900	3.1	34821
8	Industrial	291.5	720.3	50%	360.1	50%	360.1	2519	1225	2449	1102			2204		
		291.5	720.3		360.1		360.1	2519	1225	2449	1102	4.3	6044	2204	3.9	11036
9	Heavy Industrial	13.8	34.2	0%	0.0	100%	34.2	120	0	116	0			105		
	Industrial	51.0	126.1	0%	0.0	100%	126.1	441	0	429	0			386		
	Heavy Industrial	90.0	222.4	0%	0.0	100%	222.4	778	0	756	0			681		
	Industrial	24.0	59.3	0%	0.0	100%	59.3	207	0	202	0			181		
		178.9	442.0		0.0		442.0	1545	0	1503	0	0.0	0	1352	4.2	7219
Total		3514	8684		3860		4836		16468	32478	14821		65192	29230		132710

Green Highlighted Areas Designated by RVC as within Conrich Hamlet

Design Criteria		
Industrial, Commercial, Institutional Consumptive Use	3.4	m <sup>3</sup> /day/gross acre
Residential Water Demand per Capita	340	L/capita/day
Max Day Factor, ADDxMDF=MDD	2.0	
Peak Hour Factor, MDDxPHF=PHD	2.5	



## **APPENDIX C**

---

Opinion of Probable Cost



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #1 - Option 1				
1 Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 30,000	\$ 30,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 75,000	\$ 225,000
7 Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9 Electrical Work	1	LS	\$ 250,000	\$ 250,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (525mm) Forcemain	750	LM	\$ 650	\$ 487,500
12 Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13 Topsoil Stripping, Replacement and Seeding	7500	m2	\$ 14.00	\$ 105,000
14 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	4200	LM	\$ 155	\$ 651,000
Subtotal				\$ 2,900,000
CONTINGENCY (25%)				\$750,000
ENGINEERING (15%)				\$450,000
TOTAL				\$ 4,100,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450mm



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #1 - Option 2				
1 Mobilization/Demobilization	1	LS	\$ 225,000	\$ 225,000
2 Erosion & Sedimentation Control	1	LS	\$ 35,000	\$ 35,000
3 Care of Water	1	LS	\$ 35,000	\$ 35,000
4 Supply and Install Cast-in-place Dry and Wetwell	1	LS	\$ 550,000	\$ 550,000
5 Supply and Install Prefabricated Building	1	LS	\$ 210,000	\$ 210,000
6 Supply and Install Pumps	4	ea	\$ 75,000	\$ 300,000
7 Supply and Install Generator	1	LS	\$ 225,000	\$ 225,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 275,000	\$ 275,000
9 Electrical Work	1	LS	\$ 350,000	\$ 350,000
10 Lift Station Site Work	1	LS	\$ 35,000	\$ 35,000
11 Supply and Install (2x450mm) Forcemain	750	LM	\$ 800	\$ 600,000
12 Tie-into existing ERVWWTM 600mm	2	ea	\$ 60,000	\$ 120,000
13 Topsoil Stripping, Replacement and Seeding	7500	m2	\$ 14.00	\$ 105,000
14 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	4200	LM	\$ 155	\$ 651,000
Subtotal				\$ 3,750,000
CONTINGENCY (25%)				\$950,000
ENGINEERING (15%)				\$600,000
TOTAL				\$ 5,300,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450mm



## Opinion of Probable Cost

DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	COST
<b>Servicing Area #2 - Option 1</b>					
1	Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2	Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3	Care of Water	1	LS	\$ 30,000	\$ 30,000
4	Supply and Install Cast-in-place Concrete Wetwell (3x4x7)	1	LS	\$ 350,000	\$ 350,000
5	Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6	Supply and Install Pumps	3	ea	\$ 50,000	\$ 150,000
7	Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8	Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9	Electrical Work	1	LS	\$ 250,000	\$ 250,000
10	Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11	Supply and Install (350mm) Forcemain	2300	LM	\$ 500	\$ 1,150,000
12	Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13	Topsoil Stripping, Replacement and Seeding	23000	m2	\$ 14.00	\$ 322,000
14	Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	1000	LM	\$ 155	\$ 155,000
Subtotal					\$ 3,150,000
CONTINGENCY (25%)					\$800,000
ENGINEERING (15%)					\$500,000
<b>TOTAL</b>					<b>\$ 4,450,000</b>

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs

[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #2 - Option 2				
1 Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 30,000	\$ 30,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 50,000	\$ 150,000
7 Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9 Electrical Work	1	LS	\$ 250,000	\$ 250,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (450mm) Forcemain	3600	LM	\$ 550	\$ 1,980,000
12 Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13 Topsoil Stripping, Replacement and Seeding	36000	m2	\$ 14.00	\$ 504,000
14 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	1000	LM	\$ 155	\$ 155,000
Subtotal				\$ 4,250,000
CONTINGENCY (25%)				\$1,100,000
ENGINEERING (15%)				\$650,000
TOTAL				\$ 6,000,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450mm



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #3 - Option 1/2				
1 Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 30,000	\$ 30,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 75,000	\$ 225,000
7 Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9 Electrical Work	1	LS	\$ 250,000	\$ 250,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (525mm) Forcemain	50	LM	\$ 650	\$ 32,500
12 Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13 Topsoil Stripping, Replacement and Seeding	500	m2	\$ 14.00	\$ 7,000
14 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	1600	LM	\$ 155	\$ 248,000
15 Oversize Recovery for Supply and Install 525mm PVC gravity main <sup>[1]</sup>	2400	LM	\$ 250	\$ 600,000
Subtotal				\$ 2,550,000
CONTINGENCY (25%)				\$650,000
ENGINEERING (15%)				\$400,000
TOTAL				\$ 3,600,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450/525mm



Opinion of Probable Cost

DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	COST
<b>Servicing Area #4 - Option 1</b>					
1	Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2	Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3	Care of Water	1	LS	\$ 30,000	\$ 30,000
4	Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5	Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6	Supply and Install Pumps	3	ea	\$ 75,000	\$ 225,000
7	Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8	Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9	Electrical Work	1	LS	\$ 250,000	\$ 250,000
10	Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11	Supply and Install (525mm) Forcemain	50	LM	\$ 650	\$ 32,500
12	Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13	Topsoil Stripping, Replacement and Seeding	500	m2	\$ 14.00	\$ 7,000
14	Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	2400	LM	\$ 155	\$ 372,000
15	Oversize Recovery for Supply and Install 525mm PVC gravity main <sup>[1]</sup>	1600	LM	\$ 250	\$ 400,000
Subtotal					\$ 2,500,000
CONTINGENCY (25%)					\$650,000
ENGINEERING (15%)					\$400,000
<b>TOTAL</b>					<b>\$ 3,550,000</b>

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
 [1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450/525mm



Opinion of Probable Cost

DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	COST
<b>Servicing Area #4 - Option 2</b>					
1	Mobilization/Demobilization	1	LS	\$ 250,000	\$ 250,000
2	Erosion & Sedimentation Control	1	LS	\$ 35,000	\$ 35,000
3	Care of Water	1	LS	\$ 35,000	\$ 35,000
4	Supply and Install Cast-in-place Dry and Wetwell	1	LS	\$ 550,000	\$ 550,000
5	Supply and Install Prefabricated Building	1	LS	\$ 210,000	\$ 210,000
6	Supply and Install Pumps	4	ea	\$ 75,000	\$ 300,000
7	Supply and Install Generator	1	LS	\$ 225,000	\$ 225,000
8	Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 275,000	\$ 275,000
9	Electrical Work	1	LS	\$ 350,000	\$ 350,000
10	Lift Station Site Work	1	LS	\$ 35,000	\$ 35,000
11	Supply and Install (2 x 525mm) Forcemain	50	LM	\$ 1,000	\$ 50,000
12	Tie-into existing ERVWWTM 600mm	2	ea	\$ 60,000	\$ 120,000
13	Topsoil Stripping, Replacement and Seeding	500	m2	\$ 14.00	\$ 7,000
14	Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	2400	LM	\$ 155	\$ 372,000
15	Oversize Recovery for Supply and Install 525mm PVC gravity main <sup>[1]</sup>	1600	LM	\$ 250	\$ 400,000
Subtotal					\$ 3,250,000
CONTINGENCY (25%)					\$850,000
ENGINEERING (15%)					\$500,000
<b>TOTAL</b>					<b>\$ 4,600,000</b>

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
 [1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450/525mm





Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #5 - Option 1/2				
1 Mobilization/Demobilization	1	LS	\$ 150,000	\$ 150,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 30,000	\$ 30,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x6)	1	LS	\$ 325,000	\$ 325,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 50,000	\$ 150,000
7 Supply and Install Generator	1	LS	\$ 115,000	\$ 115,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 160,000	\$ 160,000
9 Electrical Work	1	LS	\$ 225,000	\$ 225,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (250mm) Forcemain	600	LM	\$ 400	\$ 240,000
12 Tie-into gravity manhole	1	LS	\$ 15,000	\$ 15,000
13 Highway #1 Crossing	1	LS	\$ 150,000	\$ 150,000
14 Topsoil Stripping, Replacement and Seeding	6000	m2	\$ 14.00	\$ 84,000
Subtotal				\$ 1,850,000
CONTINGENCY (25%)				\$500,000
ENGINEERING (15%)				\$300,000
TOTAL				\$ 2,650,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #6 - Option 1				
1 Mobilization/Demobilization	1	LS	\$ 250,000	\$ 250,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 35,000	\$ 35,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 75,000	\$ 225,000
7 Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9 Electrical Work	1	LS	\$ 250,000	\$ 250,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (525 mm) Forcemain	4000	LM	\$ 650	\$ 2,600,000
12 Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
13 Topsoil Stripping, Replacement and Seeding	40000	m2	\$ 14.00	\$ 560,000
14 Oversize Recovery for Supply and Install 375mm PVC gravity main <sup>[1]</sup>	2000	LM	\$ 100	\$ 200,000
15 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	2200	LM	\$ 155	\$ 341,000
Subtotal				\$ 5,400,000
CONTINGENCY (25%)				\$1,350,000
ENGINEERING (15%)				\$850,000
TOTAL				\$ 7,600,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 375/450mm



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #6 - Option 2				
1 Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2 Erosion & Sedimentation Control	1	LS	\$ 30,000	\$ 30,000
3 Care of Water	1	LS	\$ 30,000	\$ 30,000
4 Supply and Install Cast-in-place Concrete Wetwell (3x4x9)	1	LS	\$ 400,000	\$ 400,000
5 Supply and Install Prefabricated Building (6.5x9)	1	LS	\$ 110,000	\$ 110,000
6 Supply and Install Pumps	3	ea	\$ 75,000	\$ 225,000
7 Supply and Install Generator	1	LS	\$ 130,000	\$ 130,000
8 Process/Mechanical Work (Lift Station and Building)	1	LS	\$ 180,000	\$ 180,000
9 Electrical Work	1	LS	\$ 250,000	\$ 250,000
10 Lift Station Site Work	1	LS	\$ 25,000	\$ 25,000
11 Supply and Install (525 mm) Forcemain	300	LM	\$ 650	\$ 195,000
12 Tie-into Manhole	1	LS	\$ 15,000	\$ 15,000
13 Railway Crossing	1	LS	\$ 200,000	\$ 200,000
14 Topsoil Stripping, Replacement and Seeding	3000	m2	\$ 14.00	\$ 42,000
15 Oversize Recovery for Supply and Install 375mm PVC gravity main <sup>[1]</sup>	2000	LM	\$ 155	\$ 310,000
16 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	2200	LM	\$ 250	\$ 550,000
Subtotal				\$ 2,900,000
CONTINGENCY (25%)				\$750,000
ENGINEERING (15%)				\$450,000
TOTAL				\$ 4,100,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 375/450mm



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #7 - Option 1/2				
1 Mobilization/Demobilization	1	LS	\$ 200,000	\$ 200,000
2 Erosion & Sedimentation Control	1	LS	\$ 25,000	\$ 25,000
3 Care of Water	1	LS	\$ 25,000	\$ 25,000
4 Supply and Install Pump	1	ea	\$ 75,000	\$ 75,000
5 Process Mechanical Work for Expansion	1	LS	\$ 100,000	\$ 100,000
6 Electrical Work for Expansion	1	LS	\$ 100,000	\$ 100,000
7 Secondary Storage	1	LS	\$ 250,000	\$ 250,000
8 Supply and Install second forcemain (525mm)	2300	LM	\$ 650	\$ 1,495,000
9 Tie-into existing ERVWWTM 600mm	1	LS	\$ 60,000	\$ 60,000
10 Railway Crossing	1	LS	\$ 200,000	\$ 200,000
11 Oversize Recovery for Supply and Install 450mm PVC gravity main <sup>[1]</sup>	2800	LM	\$ 155	\$ 434,000
Subtotal				\$ 3,000,000
CONTINGENCY (25%)				\$750,000
ENGINEERING (15%)				\$450,000
TOTAL				\$ 4,200,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs  
[1] Developer responsible for costs associated with pipe supply and install up to 300mm, RVC contributes costs difference between 300mm and 450mm



Opinion of Probable Cost

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Servicing Area #9 - Option 1/2				
1 Mobilization/Demobilization	1	LS	\$ 75,000	\$ 75,000
2 Erosion & Sedimentation Control	1	LS	\$ 20,000	\$ 20,000
3 Care of Water	1	LS	\$ 20,000	\$ 20,000
4 Supply and Install forcemain (150mm)	2400	LM	\$ 350	\$ 840,000
5 Tie-into gravity main	1	LS	\$ 15,000	\$ 15,000
6 Topsoil Stripping, Replacement and Seeding	24000	m2	\$ 14.00	\$ 336,000
Subtotal				\$ 1,350,000
CONTINGENCY (25%)				\$350,000
ENGINEERING (15%)				\$250,000
TOTAL				\$ 1,950,000

Note: Does not include Easement Costs, Land Aquisition Costs or Operational Costs