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# TOWN OF KILLAM

## 5 YEAR CAPITAL PROJECTS REPORT (2024 – 2029)



Prepared for: Town of Killam  
Presented by: Select Engineering Consultants Ltd.  
Date: October 26, 2023  
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# 1.0 Introduction

## 1.1 Background Information

The town of Killam is located in east-central Alberta within Flagstaff County at the junction of Highway 13 and Highway 36. In 2021, the population of Killam was reported by Statistics Canada to be 918 people.

Killam is a successful town in the area, servicing agricultural and mining industries. To address rehabilitation and upgrade needs of Town infrastructure, the Town of Killam has contracted Select Engineering Consultants to complete a 5 Year Capital Projects Report.

This report will assist the Town with its infrastructure management program by identifying priorities based on comprehensive inventory, inspection, capacity assessment and maintenance initiatives. Early identification of asset deficiencies facilitates cost effective maintenance, rehabilitation and upgrade measures.

## 1.2 Five Year Capital Projects Report

This five year capital projects report provides an assessment of existing underground utilities and road infrastructure to set forth a framework to guide rehabilitation and upgrades for the proposed duration (five years). Assessments will be based on the review of past studies and records, on-site inspections, and feedback from the Town of Killam Administration and Public Works staff.

**Figure 1** illustrates the current Town of Killam boundary, the area included in this report.

The scope of this report will include the review and recommendations of the following municipal infrastructure systems, and summary sections:

- ❖ Road Network
- ❖ Water Treatment and Distribution System
- ❖ Sanitary Sewer System
- ❖ Storm Sewer System
- ❖ Recommendations

## 1.3 Previous Reports

The following reports and studies were reviewed and incorporated in this five year capital projects report:

**Town of Killam – Existing Water Treatment Plant Assessment**  
**Select Engineering Consultants                      March 2023**

The Town of Killam and Select Engineering Consultants completed an assessment of the water treatment plant for its treatment and distribution capacity, and the condition of its components. This report is attached in **Appendix A**.

**Town of Killam – West Lift Station Flow Assessment**  
**Select Engineering Consultants                      February 2022**

The Town of Killam and Select Engineering Consultants completed an assessment of the West Lift Station including water usage volumes, sanitary sewer infrastructure capacities for current and ultimate wastewater flows in the west catch basin, and required pump rates.

**Town of Killam – Five Year Capital Projects Report**  
**Select Engineering Consultants                      October 2018**

The Town of Killam and Select Engineering Consultants completed a Five Year Capital Projects Report in October of 2018 that provided a comprehensive overview of the road infrastructure, water distribution network and sanitary sewer network along with providing recommendations for improvements over a five year timeframe.

**Town of Killam – Water Distribution System Assessment Report**  
**Select Engineering Consultants                      April 2018**

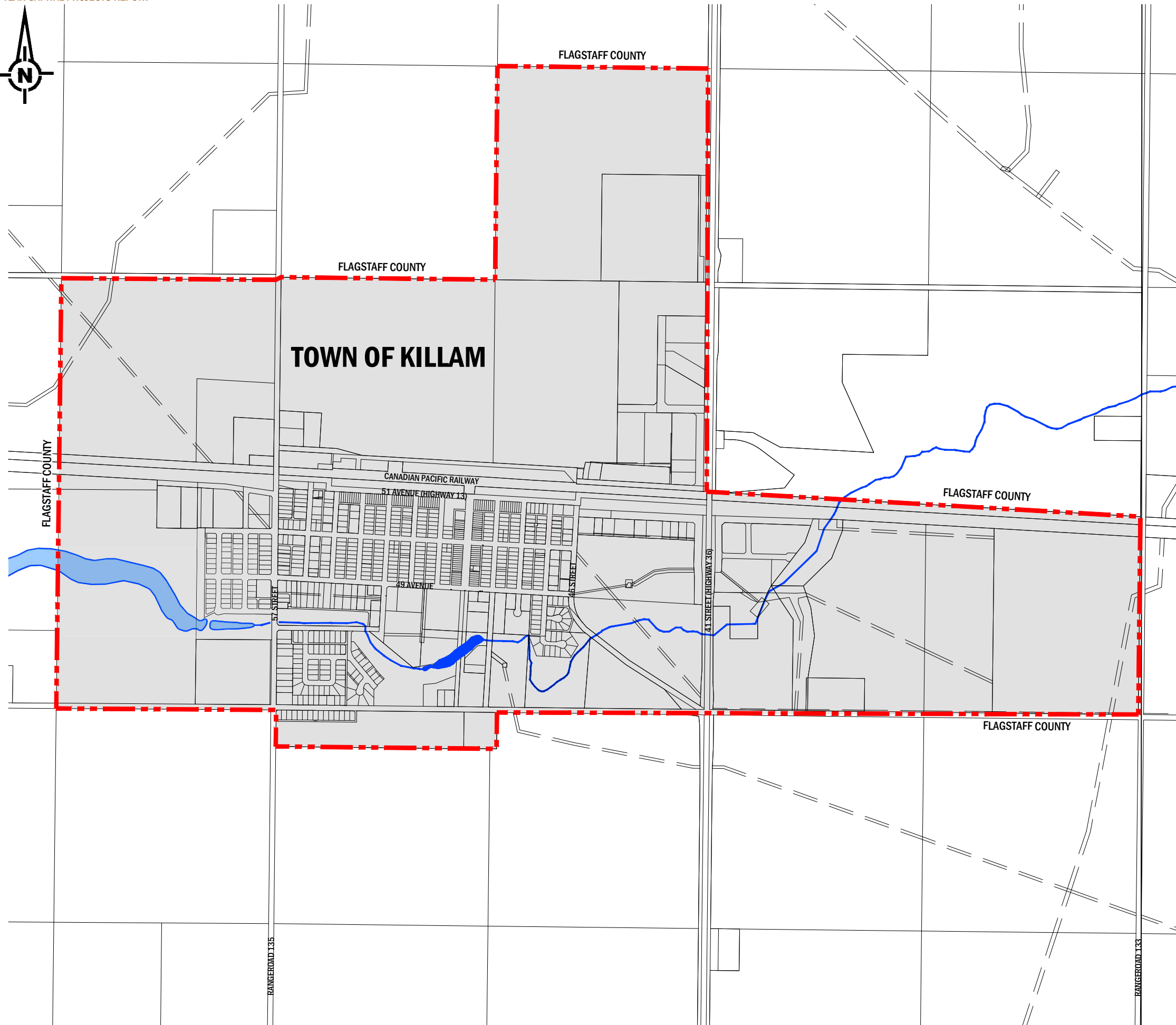
The Town of Killam and Select Engineering Consultants completed this Water Distribution System Assessment Report in April of 2018 to evaluate the capacity of the existing network to service a 25 year period of growth and provide recommendations for improvements.

**Town of Killam – Sanitary Sewer CCTV Inspections**  
**Cam-Trac / Insituform / Inline                      2013 through 2021**

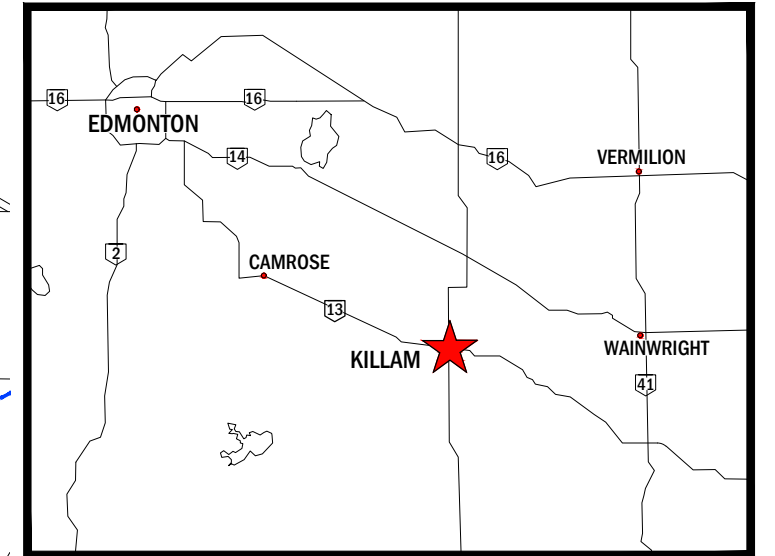
The Town of Killam has previously completed multiple sanitary sewer CCTV video inspections from 2013 through 2021 to assess the condition of the existing infrastructure. Most of the town was inspected during this period.



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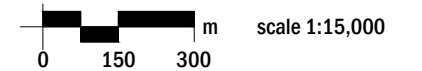


**LEGEND**  
MUNICIPAL BOUNDARY



**KEY PLAN**

NTS



**FIGURE 1**  
LOCATION MAP

5 YEAR CAPITAL PROJECTS REPORT  
TOWN OF KILLAM





## 2.0 Water Treatment and Distribution System

### 2.1 Overview

The Town of Killam currently owns, operates and maintains a water treatment and distribution system to service the community with potable water. Raw water is supplied by wells within town and treated at the water treatment plant (WTP). Treated water is stored in an underground concrete reservoir and is pumped through the water distribution network. An overall plan of the water system is shown in **Figure 2**.

### 2.2 Inventory

Infrastructure information related to the water system was collected to determine an overall inventory of assets, which is summarized below in **Table 2.1**:

**Table 2.1: 2023 Water Distribution System**

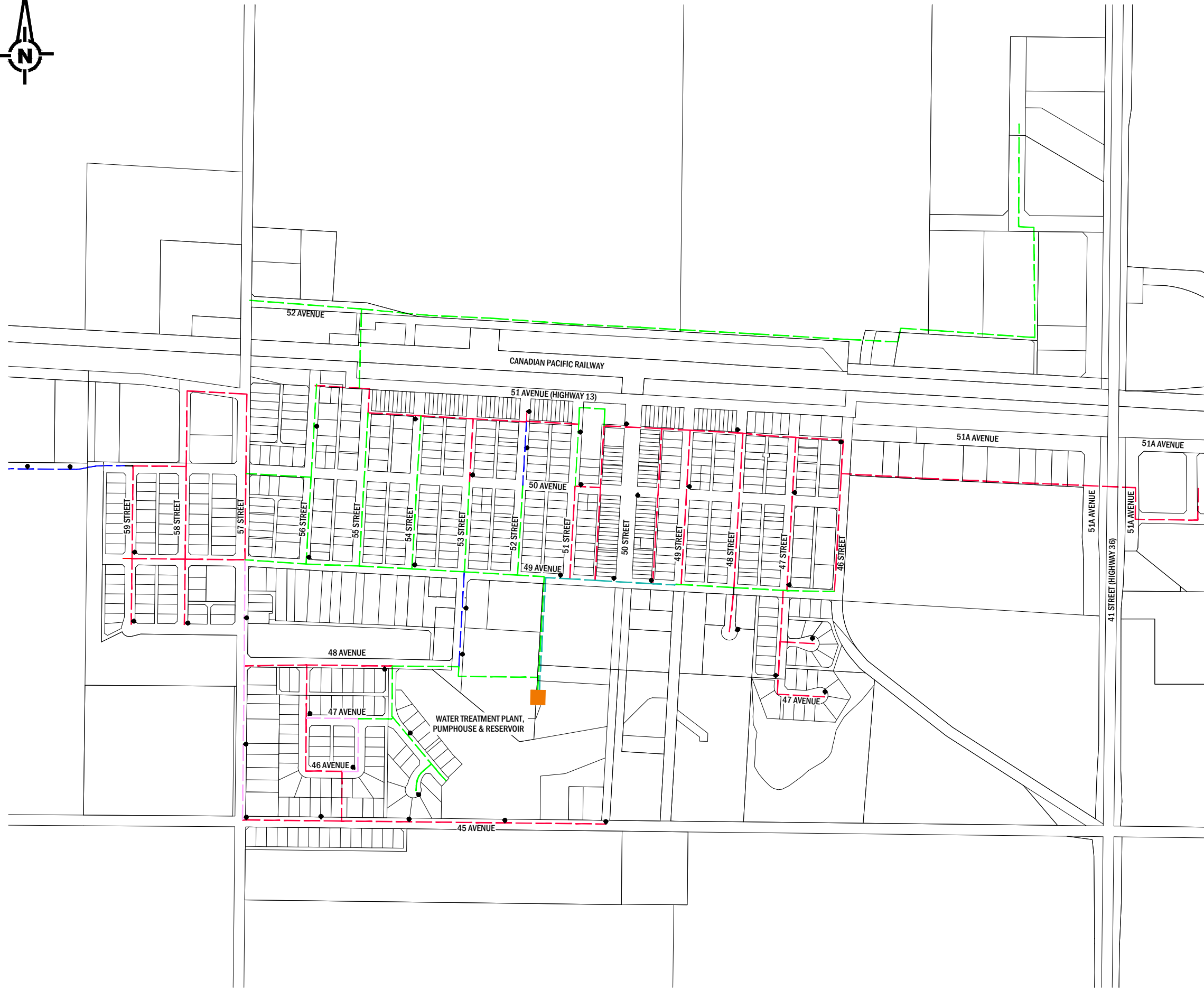
Component	Description	Quantity	Replacement Value (2023 Dollars)
Water Distribution	100mm Watermains	730 m	\$310,000
	150mm Watermains	7,150 m	\$3,575,000
	200mm Watermains	5,430 m	\$2,985,000
	250mm Watermains	540 m	\$325,000
	300mm Watermains	460 m	\$310,000
	Gate Valves	92	\$460,000
	Fire Hydrants	42	\$630,000
Water Treatment and Storage	WTP and Reservoir	1	\$6,000,000
Water Supply	Raw Water Wells	3	\$100,000
Estimated System Replacement Value (2023)			<b>\$14,695,000</b>

### 2.3 Raw Water Supply








Three (3) raw water wells located on SW 17-044-13-W4 near the WTP supply the plant with raw water from underground aquifers. The wells, installed in the 1960's and in 1996, operate under a license to divert and use water issued by Alberta Environment which prescribes a maximum daily volume per well. For the three wells, this totals 2,394 m<sup>3</sup> per day. This greatly exceeds the maximum day demand of water usage projected for a 25 year growth period of 1,059 m<sup>3</sup> per day, as estimated in the March 2023 assessment of the WTP (see **Appendix A**). The three well pumps were observed in 2017 to operate at 25.3 L/s combined.

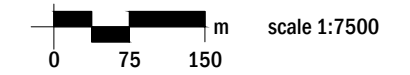


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**LEGEND**

-  EXISTING 100mm WATERMAIN
-  EXISTING 150mm WATERMAIN
-  EXISTING 200mm WATERMAIN
-  EXISTING 250mm WATERMAIN
-  EXISTING 300mm WATERMAIN
-  EXISTING HYDRANT
-  EXISTING WTP, PUMPHOUSE & RESERVOIR



**FIGURE 2**  
**EXISTING WATER DISTRIBUTION SYSTEM**

5 YEAR CAPITAL PROJECTS REPORT  
TOWN OF KILLAM



The March 2023 assessment recommended that the rehabilitation of the oldest well, Wel No. 1 and the assessment of the other two wells be undertaken within two years.

Since the completion of the March 2023 assessment, Public Works has had all three raw water wells inspected, and is currently planning on rehabilitating Well No. 1 before the end of 2023. A copy of the work order related to this inspection is included in **Appendix B**.

Following this work, there are no expected capital projects required regarding the Raw Water Wells over the next five years.

## 2.4 Water Treatment Plant and Reservoir

The Town of Killam's water treatment plant and reservoir was constructed in the 1970's and is in a south central location of the town. Its key components are summarized below in **Table 2.3**. Baffle curtains were installed in the reservoir in 2015 to increase the plant's disinfection capacity. The two (2) distribution pumps were replaced in 2012 and are 15 horsepower Grundfos multi-stage submersible pumps model 300S 150-4. The engine on the emergency pump was replaced with an electrical motor in 2022. In the event of electrical service failure, a backup generator (installed in 2019) can ensure power is maintained in the plant and, thus, water supply would be uninterrupted.

**Table 2.3 Water Treatment Plant and Reservoir**

Component	Quantity		Capacity
Treatment Filters	3	1970's	22.1 L/s total
Storage Reservoir	1	1977	1,324 m <sup>3</sup>
Distribution Pumps	2	2012	20.0 L/s each
Emergency Pump	1	1977	56.8 L/s

In 2023, Select Engineering Consultants completed an assessment of the water treatment plant for its treatment and distribution capacity to meet demands projected for 25 years; this is attached in **Appendix A**. It found that the existing capacity of the treatment processes can meet projected maximum day demands, the existing pumps can meet projected peak hour demands with any one pump out of service, and the existing reservoir meets projected storage requirements for fire flow, equalization, and emergency storage requirements.

The condition of the facility was also assessed. The distribution piping inside the plant, which is original, was recommended for replacement within a year. Furthermore, it was recommended to, over the next five years, undertake investigations required to efficiently and cost-effectively replace the treatment filters which will deteriorate with time and pose a significant capital cost.

Following the completion of the March 2023 assessment, Public Works requested that upgrades to the Chlorine, Fluoride, and pH analyzers be reviewed, due to the age of the existing analyzers and operational issues they have been having. Select Engineering has presented and recommended a cost estimate for this work, which is included in **Appendix C**.

## 2.5 Water Distribution Network

The water distribution network is comprised of pipes ranging in size from 100mm to 300mm diameter and are made of asbestos cement or PVC. An overall schematic can be seen in **Figure 2**.

In 2018, Select Engineering completed a study titled “Town of Killam Water Distribution System Assessment” which included detailed modelling of the Town’s water system to assess its capacity to meet existing and future growth requirements. Numerous watermains were recommended for installation to create looping and for size upgrades to meet the existing maximum day demand plus fire flows. These improvements are detailed on Figure 4.5 from the “Town of Killam Water Distribution System Assessment”. Installation of additional fire hydrants were also recommended to provide full coverage.

## 2.6 Completed Works

Since Select Engineering Consultants began working with the Town of Killam in 2009, the Town has completed several water treatment and distribution system improvement projects. The following projects were completed in recent years:

- ❖ 2015: 49 Avenue (49 St to 51 St) – Watermain replacement
- ❖ 2015: Service Road (49 Ave to WTP) – Watermain replacement
- ❖ 2015: 49 Avenue – Fire hydrants installation
- ❖ 2015: WTP – Reservoir baffle curtain installation (to increase disinfection capacity)
- ❖ 2018: Water network analysis
- ❖ 2019: 51 Street (50 Ave to 51 Ave) – Watermain installation
- ❖ 2019: WTP – Generator installation
- ❖ 2020: 52 Street (50 Ave to 51 Ave) – Watermain replacement
- ❖ 2021: 53 Street (48 Ave to 49 Ave) – Watermain replacement
- ❖ 2022: WTP - Emergency pump motor replacement

## 2.7 Proposed Improvements

While taking into account the system's condition and capacity discussed above, previously made recommendations, and the planned improvements of other infrastructure systems, we recommend that the following improvements be considered for completion in the next five years to improve the reliability of the water system:

- ❖ WTP distribution piping - Replacement
- ❖ Watermain replacement – 52 Street (49 Ave to 50 Ave)
- ❖ WTP filters – Plan for replacement (physical and budgetary requirements)
- ❖ Chlorine, Fluoride and pH Analyzers - Replacement

## 3.0 Sanitary Sewer System

### 3.1 Overview

The Town of Killam currently operates and maintains a sanitary sewer system that conveys all wastewater generated by the community to the Main Lift Station east of 46 Street that pumps the wastewater through a pressurized sewage forcemain to the wastewater treatment lagoon by the east municipal border.

Wastewater collected by gravity sewers from the west side of Killam, west of 55 Street, is pumped by a local lift station through a forcemain to a manhole in a central area of town connected to the gravity system.

An overall plan of the sanitary sewer system, as it operates currently, is summarized in **Figure 3**.

### 3.2 Inventory

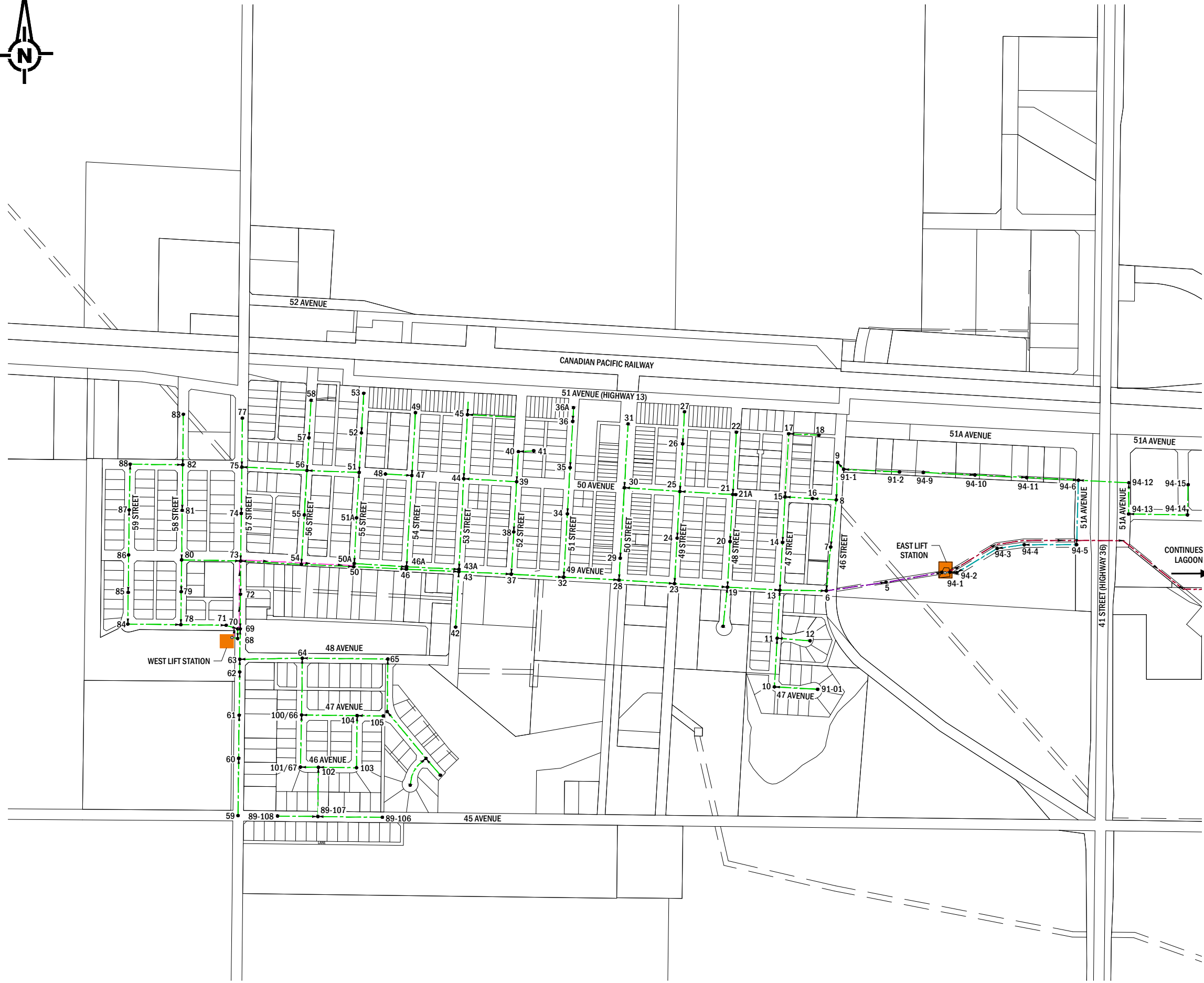
Infrastructure information related to the Town's sanitary sewer collection system was collected to determine an overall inventory of assets. **Table 3.1** summarizes the inventory:

**Table 3.1: 2023 Sanitary Sewer System Inventory**

Component	Description	Quantity	Replacement Value (2023 Dollars)
Gravity Sewer Collection System	200mm Sewer Mains	10,250 m	\$4,612,500
	250mm Sewer Mains	220 m	\$125,000
	300mm Sewer Mains	380 m	\$209,000
	350mm Sewer Mains	4 m	\$5,000
	Access Manholes	122	\$976,000
Forcemains	150mm Sewer Forcemain	375 m	\$131,000
	250mm Sewer Forcemain	1,500 m	\$825,000
Lift Stations	Main (Wet Well)	1	\$1,000,000
	West (Wet Well)	1	\$750,000
Wastewater Lagoon	Treatment Cells	350,000 m <sup>3</sup>	\$3,000,000
Estimated System Replacement Value (2023)			<b>\$11,633,500</b>



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**LEGEND**

- EXISTING 200mm SANITARY SEWER
- EXISTING 250mm SANITARY SEWER
- EXISTING 300mm SANITARY SEWER
- EXISTING 150mm SANITARY SEWER FORCEMAIN
- EXISTING 250mm SANITARY SEWER FORCEMAIN
- 124 ● EXISTING SANITARY MANHOLE w/ MANHOLE NUMBER
- EXISTING LIFT STATION

**FIGURE 3**  
**EXISTING SANITARY SEWER SYSTEM**



### 3.3 Gravity Sewer Collection System

Existing sanitary sewer mains servicing Killam include local sanitary service connections to individual residential, commercial, and industrial properties. These service connections convey wastewater into the sanitary sewer mains, which collectively carry wastewater through the Town and discharge at the Main Lift Station. Sanitary sewer mains are typically installed within the center of the road allowance, with access manholes placed at regular intervals (120 meters or less) and at connections to other sewer mains.

CCTV inspections can assess the condition of the existing sanitary sewer mains and identify deteriorated mains that may require replacement. Large scale flushing and video inspection programs are invaluable assets in the development of capital plans, such as this one.

The last large scale CCTV program undertaken by the Town of Killam was completed in 2021, which completed their current cycle of inspections. It is recommended that the Town continue to complete a regular rotation of CCTV inspection programs on the existing sanitary sewer collection system.

Based on the CCTV inspections, rehabilitation recommendations were provided in the previous 5 year capital plan and remain incomplete:

- Spot Repairs on 59 Street and 58 Street
- Full Replacement on 52 Street, from 49 Avenue to 50 Avenue
- Full Replacement on 51 Street, from 49 Avenue to MH 35
- Full Replacement on 50 Avenue, from 52 Street to 53 Street
- Full Replacement on 50 Avenue, from 55 Street to 56 Street

To date, one segment on 51 Street (north of 50 Avenue) was replaced in 2019 (in conjunction with watermain and road works). No further rehabilitation recommendations arose from the 2021 CCTV inspections.

#### 3.3.1 Sanitary Sewer Trunk

The sanitary sewer trunk is the final leg of the gravity system and collects all wastewater generated by the community to convey it to the Main Lift Station. It is a 200mm VCT sanitary sewer main that runs along 49 Avenue from 57 Street and then transitions into a 250mm VCT east of 46<sup>th</sup> Street as it continues another 220 meters to the Main Lift Station.

In 2013, the sanitary sewer trunk was inspected by closed circuit television (CCTV) video inspection. This inspection found the sanitary sewer trunk main to have some areas in generally poor condition and hence the trunk was partially lined in 2014 with cast-in-place structural pipe liner (CIPP).

Although existing elevations are not recorded along the sewer trunk, calculated flow capacities can be estimated at this time. We can conservatively assume it was installed at the industry



standard minimum slope for a 250mm diameter sewer main, which is 0.28%. A 250mm diameter sanitary main with a 0.28% slope would have a capacity of 31.5 L/s.

### 3.4 Sanitary Lift Stations and Forcemains

There are two sanitary lift stations currently operating as part of the Town's overall sanitary system. The Main Lift Station receives all wastewater generated by the Town, and a smaller local lift station receives wastewater from the west residential area not otherwise accessible to the gravity system. **Table 3.2** below summarizes the Town's lift stations.

**Table 3.2: Sanitary Lift Station Facilities**

Asset ID	Lift Station	Major Dates	Replacement Cost	Service Area	Age
<b>LS.1</b>	<b>Main</b>	2016 – Installed	\$1,000K	Entire Town	<b>7 Years</b>
<b>LS.2</b>	<b>West</b>	1980's – Installed 2022 – Rehabilitated	\$750K	West Zone	<b>1 Year</b>

The Main Lift Station is a 3.66 meter diameter wet well facility that was constructed in 2016 to replace the facility built in 1982. This full replacement included the structure, pipes, pumps and instrumentation, along with the associated electrical and programming. The lift station has two pumps that are both 20 horsepower Flygt NP 3153 MT 3; technical specifications are included in **Appendix D**.

The West Lift Station is a 2.0 meter diameter wet well facility that is assumed to have been built in the 1980's based on land titles registration. Record drawings for this facility are unavailable. In response to a failure of the process piping, this lift station was rehabilitated in 2022. Except for the concrete barrel that was in good condition, all components were replaced including mechanical, electrical and structural steel. There are two pumps, which are both 7.5 horsepower Sulzer model XFP100E CB1; technical specifications are included in **Appendix E**.

**Table 3.3** below summarizes each of the pumps in the Town's lift stations.

**Table 3.3: Sanitary Lift Station Pumps**

Asset ID	Lift Station	Major Dates	Pump	Replacement Cost	Age
<b>P1.1</b>	<b>Main</b>	2016	Flygt NP 3153 MT 3 (20hp)	\$40k	<b>7 Years</b>
<b>P1.2</b>	<b>Main</b>	2016	Flygt NP 3153 MT 3 (20hp)	\$40k	<b>7 Years</b>
<b>P2.1</b>	<b>West</b>	2022	Sulzer XFP100E CB1 (7.5hp)	\$30k	<b>1 Year</b>
<b>P2.2</b>	<b>West</b>	2022	Sulzer XFP100E CB1 (7.5hp)	\$30k	<b>1 Year</b>

Each lift station facility transfers wastewater through pressurized forcemains. **Table 3.4** below summarizes the Town's sanitary forcemains.

**Table 3.4: Sanitary Forcemains**

Asset ID	Lift Station	Install Date	Size & Material	Length (m)	Replacement Cost	Age
<b>FM.1</b>	<b>Main</b>	1982	250mm HDPE	1,500	\$825,000	<b>~40 Years</b>
<b>FM.2</b>	<b>West</b>	Unknown	150mm PVC	375	\$131,000	<b>Unknown</b>

We understand the Main Lift Station forcemain from the to the lagoon has been operating without incident, and no maintenance or repair work has been required or completed on it. The 1,500 meter long forcemain is, as confirmed during construction of the new main lift station, 250mm diameter HDPE.

Wastewater from the West Lift Station forcemain discharges into the sanitary gravity sewer system at 55<sup>th</sup> Street and 49<sup>th</sup> Avenue. The 375m long forcemain is, as confirmed during rehabilitation of the lift station, 150mm diameter PVC.

## 3.5 Wastewater Lagoon

The Town of Killam currently owns, maintains and operates a wastewater lagoon facility under EPEA Registration No. 887-02-00. This facility treats all wastewater collected by the Town's sanitary system and is located within the municipal boundaries at the east end, approximately 1.5 kilometers east of 46 Street. The lagoon is constructed of four (4) aerobic cells, one (1) facultative cell and one (1) storage cell occupying approximately 12.8 hectares, and currently discharges once per year, ultimately into a local creek through an 860 meter long 450mm diameter effluent pipe.

Based on information available and measuring the surface area of the lagoon cells, we estimate the facility has the following approximate capacities:

- ❖ Anaerobic Cells (3.0m depth) – 1,700 m<sup>3</sup> x 4 cells
- ❖ Facultative Cell (1.5m depth) – 50,000 m<sup>3</sup>
- ❖ Storage Cell (2.5m depth) – 300,000 m<sup>3</sup>

Design standards for municipal wastewater treatment lagoons are specified in the Alberta Environment Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, Parts 3 and 4 (March 2013), and are a function of the average daily design wastewater flow. As previously estimated in the 2023 assessment of the WTP (**Appendix A**), the average daily wastewater flow is 331m<sup>3</sup> and is projected to become 424m<sup>3</sup> in 25 years. Wastewater lagoons with average daily design flows between 250m<sup>3</sup> and 500 m<sup>3</sup> require two (2) anaerobic cells (3.0 to 3.5m depth), a facultative cell (maximum 1.5m depth) and a storage cell (maximum 3.0m depth), all operating in series. The cells are sized to retain the required number of days of wastewater flow, which are listed below in **Table 3.5**. Based on these design requirements, the required wastewater treatment cell capacities are summarized below in **Table 3.5**.

**Table 3.5: Wastewater Lagoon Sizing Requirements**

Treatment Cell	Existing Capacity (m <sup>3</sup> )	Required Holding Capacity	Year 2021 <sup>1</sup> Required Capacity (m <sup>3</sup> )	Year 2043 <sup>2</sup> Required Capacity (m <sup>3</sup> )
Anaerobic	1,700	2 days	662	848
Facultative	50,000	60 days	19,860	25,440
Storage	300,000	365 days	120,815	154,760

1. 331m<sup>3</sup> per day average flow

2. 424m<sup>3</sup> per day average flow

The estimated capacity of the existing lagoon would meet existing and design (future) requirements.

In recent years, Public Works has indicated that the facility operates without issues nor any violations under their registration.

### 3.6 Completed Works

Since Select Engineering Consultants has been working with the Town of Killam in 2009, the Town has completed a number of sanitary sewer system improvement projects. The following projects have been completed in recent years:

- ❖ 2013 to 2022: CCTV inspections
- ❖ 2013 to 2015: Miscellaneous sanitary sewer repairs
- ❖ 2016: Main Lift Station replacement
- ❖ 2019: 51 Street (51 Ave to 50 Ave) – Sanitary sewer main replacement
- ❖ 2022: West Lift Station rehabilitation

### 3.7 Proposed Improvements

Taking into account the sanitary sewer system condition and capacities discussed above, previously made recommendations, and the planned improvements on other infrastructure systems, we recommend that the following works be considered for completion in the next five years:

- ❖ Sanitary main spot repairs – 58 Street (south of 49 Ave)
- ❖ Sanitary main spot repairs – 59 Street (south of 49 Ave)
- ❖ Sanitary main replacement – 52 Street (49 Ave to 50 Ave)
- ❖ Sanitary main replacement – 50 Avenue (52 St to 53 St)
- ❖ Sanitary main replacement – 50 Avenue (55 St to 56 St)

## 4.0 Storm Sewer System

### 4.1 Overview

Currently the Town of Killam has a small network of approximately 2,300m of storm sewers that convey water into a series of ditches and waterways surrounding the town. The largest storm system conveys water south along 51 Street, east along 49 Avenue and then south to a ditch outside the developed town area. Other storm mains convey storm water along 51 Avenue and 54 Street, and discharge into Highway 13 roadside ditch and an existing creek, respectively.

An overall plan of the storm sewer network, as it operates currently, is summarized in **Figure 4**.

### 4.2 Inventory

Infrastructure information related to the Town's storm sewer collection system was collected to determine an overall inventory of assets. **Table 4.1** summarizes the inventory:

**Table 4.1: 2023 Storm Sewer System Inventory**

Component	Quantity	Replacement Value (2023 Dollars)
Storm Sewer Mains – unknown sizes	2,300 m	\$1,850,000
Manholes	31	\$250,000
Catch Basins	25	\$187,500
Estimated System Replacement Value (2023)		<b>\$2,287,500</b>

### 4.3 Storm Sewer Condition

CCTV inspections can establish the condition of the existing storm sewer mains and identify mains that show deterioration. No large-scale CCTV programs have been completed in recent years on the storm sewer system.

It is recommended to complete an annual flushing and video inspection program on the existing storm sewer system to determine which areas may require storm rehabilitation. A comprehensive CCTV program can be an invaluable resource in the development of capital plans that aim to coordinate the improvement of all infrastructure systems.

## 4.4 Storm Sewer Capacities

Sizing and capacities of the current storm system are unknown, but no instances of flooding have been reported in recent years by Public Works.

It is recommended that sizing and grades of mains are confirmed to provide for a detailed storm calculation that can determine possible areas of concern and plan for future development.

## 4.5 Proposed Improvements

We recommend that the following items be considered for completion by the Town of Killam:

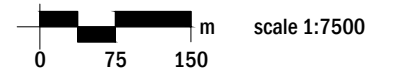
- ❖ Annual CCTV inspections



**LEGEND**

-  EXISTING STORM SEWER
-  EXISTING MANHOLE w/ MANHOLE NUMBER

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**FIGURE 4**  
**EXISTING STORM SEWER SYSTEM**



## 5.0 Road Network

### 5.1 Overview

The Town of Killam currently maintains approximately 11.9 kilometers of roadway to serve the community. This roadway network provides access for vehicular and pedestrian traffic to residential, commercial and industrial areas. The existing roadways within the municipal boundary fall into the following categories:

- ❖ Urban cross section with concrete sidewalks or curb and asphaltic cement surface;
- ❖ Rural cross section with drainage boulevards and asphaltic cement surface;
- ❖ Rural cross section with drainage boulevards and gravel or cold mix surface.

### 5.2 Inventory

Infrastructure information related to roadways within the Town of Killam was collected to determine an overall inventory of assets. **Table 5.1** summarizes the inventory of assets:

**Table 5.1: 2023 Road Network Inventory**

Component	Description	Quantity	Replacement Value (2023 Dollars)
Asphalt Roadways	Asphalt Road Structure	137,150 m <sup>2</sup>	\$10,972,000
	Concrete Curb and Gutters	16,750 m	\$2,931,000
	Monolithic Concrete Sidewalks	3,400 m	\$1,020,000
	Separate Concrete Sidewalks	10,300 m	\$2,575,000
Estimated Road Network Replacement Value (2023)			<b>\$17,498,000</b>

### 5.3 Infrastructure Status

Select Engineering Consultants had personnel on-site to conduct a visual inspection of the existing roadway network in June 2023. This visual inspection was completed to establish a rating for each roadway within the Town. Roadways constructed with a cold mix asphalt or gravel surface, and Highway or County roads located within the municipal boundary were not assigned ratings.

Each roadway was assigned a rating based on when the Town should complete remedial work to ensure an adequate level of service is maintained. The rating criteria are as follows:



**Table 5.2: Road Condition Rating Criteria**

Road Condition Rating	Description	Maintenance Action
1 - 2	Very Poor	Immediate maintenance by complete rehabilitation
3 - 4	Poor	Delayed maintenance by complete rehabilitation
5 - 6	Fair	Maintenance with partial or complete rehabilitation
7 - 8	Satisfactory	Increase routine maintenance
9 - 10	Good	Maintain routine maintenance

When assigning a rating, the following items were considered:

- ❖ Condition of concrete curbs and sidewalks,
- ❖ Drainage conditions,
- ❖ Asphalt defects (e.g. aggregate loss, alligator or block cracking),
- ❖ Settlements of prior underground installations, and
- ❖ Overall drivability.

The overall ratings applied to each roadway are summarized in **Figure 5**. No areas were found with a Very Poor rating, nine (9) areas were identified with a Poor rating, and twenty four (24) areas were identified with a Fair rating. Examples of these road ratings are shown in **Appendix G**.

The rating system presented above provides an overall indicator of road quality. Further investigation would be recommended to determine existing soil and road structure conditions to better identify the cause of the deteriorating surface.

Additionally, there are fifteen (15) locations that require asphalt patching, with an approximate total area of 615 m<sup>2</sup>. The location and approximate size of each spot repair is shown in **Figure 6** and listed below in **Table 5.3** with cost estimates. Photos of each location are shown in **Appendix H**.

**Table 5.3: Road Spot Repairs**

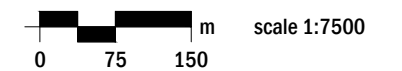
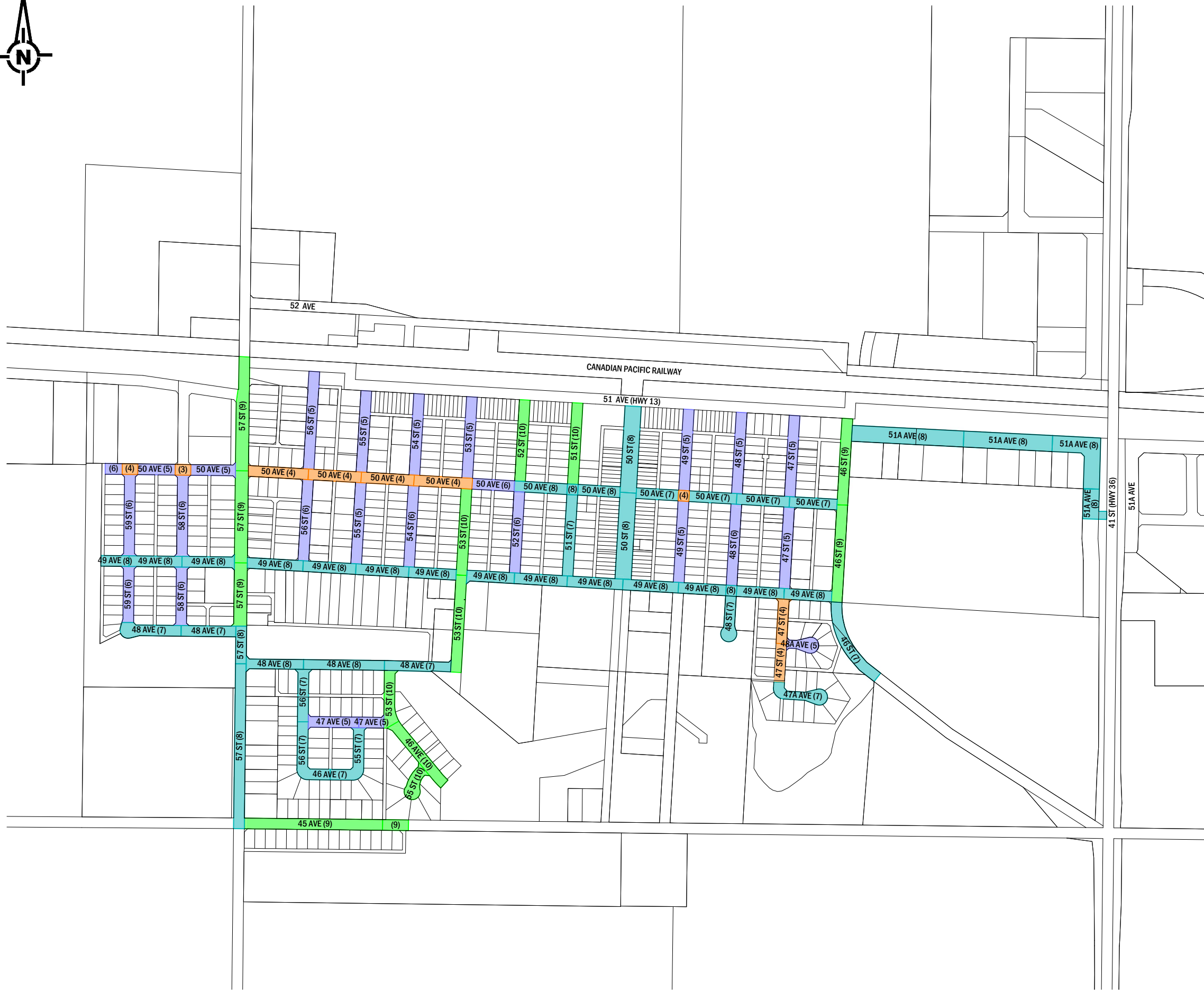
Asphalt Patch Location	Approximate Quantity (m <sup>2</sup> )	Cost Estimate (2023 Dollars)
1	75 m <sup>2</sup>	\$8,250
2	125 m <sup>2</sup>	\$13,750
3	45 m <sup>2</sup>	\$5,000
4	45 m <sup>2</sup>	\$5,000
5	22 m <sup>2</sup>	\$2,500
6	31 m <sup>2</sup>	\$3,500
7	11 m <sup>2</sup>	\$1,500
8	30 m <sup>2</sup>	\$3,500
9	52 m <sup>2</sup>	\$5,750
10	23 m <sup>2</sup>	\$2,750
11	69 m <sup>2</sup>	\$7,600
12	26 m <sup>2</sup>	\$3,000
13	26 m <sup>2</sup>	\$3,000
14	10 m <sup>2</sup>	\$1,300
15	25 m <sup>2</sup>	\$2,900



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**LEGEND**

- REHABILITATION IN 1-3 YEARS
- REHABILITATION IN 3-5 YEARS
- REHABILITATION IN 5-10 YEARS
- REHABILITATION IN 10+ YEARS



**FIGURE 5**  
**EXISTING ROAD CONDITIONS -**  
**OVERALL**

5 YEAR CAPITAL PROJECTS REPORT  
 TOWN OF KILLAM

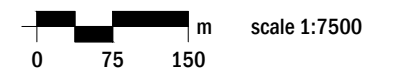




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Asphalt Patch Location	Approx. Quantity (m <sup>2</sup> )
1	75
2	125
3	45
4	45
5	22
6	31
7	11
8	30
9	52
10	23
11	69
12	26
13	26
14	10
15	25



**FIGURE 6**  
EXISTING ROAD CONDITIONS -  
SPOT REPAIRS

5 YEAR CAPITAL PROJECTS REPORT  
TOWN OF KILLAM



## 5.4 Completed Works

Since Select Engineering Consultants has been working with the Town of Killam in 2009, the Town has completed several road improvements projects that included asphalt overlays, concrete replacements and complete reconstruction of existing roadways. The following projects have been completed in recent years:

- ❖ 2011: 50 Street (49 Ave to 51 Ave) – Concrete replacements and asphalt overlay
- ❖ 2012: 46 Street (49 Ave to 51 Ave) – Concrete replacements and asphalt overlay
- ❖ 2013: Various locations - Miscellaneous asphalt patches
- ❖ 2015: 49 Avenue (49 St to 51 St) – Asphalt patches
- ❖ 2016: Various locations - Miscellaneous asphalt patches
- ❖ 2017: 54 Street, 46 Avenue, 53 Street - New construction (residential subdivision)
- ❖ 2018: Various locations - Miscellaneous asphalt patches
- ❖ 2019: Roadway geotechnical investigation (**Appendix F**)
- ❖ 2019: 51 Street (50 Ave to 51 Ave) – Concrete replacements and road reconstruction
- ❖ 2020: 52 Street (50 Ave to 51 Ave) – Concrete replacements and road reconstruction
- ❖ 2020: Various Locations - Miscellaneous asphalt patches
- ❖ 2021: 53 Street (48 Ave to 50 Ave) – Concrete replacements and road reconstruction
- ❖ 2023: 51 Avenue (57 St to Highway 13) – Gravel surface grading and culvert replacements

## 5.5 Proposed Improvements

Based on previous recommendations made to the Town of Killam, roadway ratings and historical capital project budgets passed by the Town, the following roadway improvements are recommended for consideration in the next five years:

- ❖ Complete Rehabilitation - 50 Avenue (52 Street to 56 Street)
- ❖ Complete Rehabilitation – 52 Street (49 Street to 50 Street)
- ❖ Complete Rehabilitation – 47 Street (47 Avenue to 49 Avenue)
- ❖ Asphalt patch repairs – Various locations

## 6.0 Five Year Capital Plan

The recommended improvements discussed in this report have been staged over five years to create an overall five year capital plan that is outlined below and summarized in **Figure 7**. A detailed cost estimate is included in **Appendix I**. Cost estimates are subject to change following confirmation of scope of work. The total estimated cost for the proposed major capital projects during the 2024 to 2028 period is approximately **\$3,617,000**.

### 6.1 Year 2024 Proposed Projects

❖ Sanitary Spot Repairs and Asphalt Patching Program	<b>\$168,000</b>
❖ Water Treatment Plant – Piping and Analyzer Upgrades	<b>\$160,000</b>
❖ Storm Sewer Flushing and CCTV Inspection	<b>\$25,000</b>

### 6.2 Year 2025 Proposed Projects

❖ Sewer and Road Improvements – 50 Ave (54 St to 56 St)	<b>\$721,000</b>
❖ Storm Sewer Flushing and CCTV Inspection	<b>\$25,000</b>

### 6.3 Year 2026 Proposed Projects

❖ Sewer and Road Improvements – 50 Ave (52 St to 54 St)	<b>\$700,000</b>
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### 6.4 Year 2027 Proposed Projects

❖ Water, Sewer and Road Improvements – 52 St (49 Ave to 50 Ave)	<b>\$1,132,000</b>
❖ Water Treatment Plant – Pre-Design for Filter Replacement	<b>\$25,000</b>

### 6.5 Year 2028 Proposed Projects

❖ Road Improvements – 47 St (47 Ave to 49 Ave)	<b>\$661,000</b>
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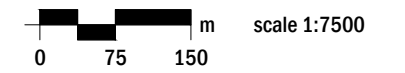


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**LEGEND**

- 2024 SANITARY SPOT REPAIRS
- 2025 SEWER AND ROAD IMPROVEMENTS
- 2026 SEWER AND ROAD IMPROVEMENTS
- 2027 WATER, SEWER AND ROAD IMPROVEMENTS
- 2028 ROAD IMPROVEMENTS



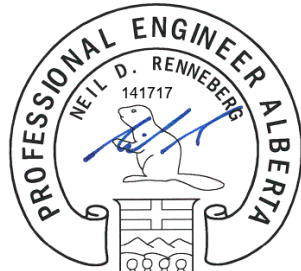
**FIGURE 7**  
**PROPOSED IMPROVEMENTS**

**5 YEAR CAPITAL PROJECTS REPORT**  
TOWN OF KILLAM



## 7.0 Report Submittal

This report has been prepared and submitted by Select Engineering Consultants Ltd., as documented below:



2023-10-26

Neil Renneberg, P. Eng.  
Senior Project Manager