CITY OF SPRUCE GROVE

WATER MASTER PLAN

REPORT RECORDS	
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Executive Summary

The City of Spruce Grove retained Select Engineering to prepare an updated Water Mater Plan that encompasses the current development status and forecasted servicing demands within the current City limits. Immediately adjacent lands outside of the City limits have been included in the study area for potential growth areas forecasted for development over the next 20-year timeline.

The City's potable water system has been assessed for adequacy and guidance for future expansion and to determine any upgrades required to accommodate current and anticipated growth.

Distribution Mains

- the City's dedication to replace asbestos cement, ductile iron and cast-iron piping with PVC mains has provided long term system efficiencies with respect to:
  - reduced system maintenance/repair requirements
  - fewer unplanned service interruptions
  - reduced system failures caused by rapid seasonal changes and impacts of annually repeated frost conditions
  - reduced system leakage promoting fiscal accountability
  - reduced and relevant ground water impacts from leaky piping
  - improved water quality and circulation within the system
- the current distribution system does not achieve Peak Day Demand plus Fire Flow (PDD+FF) due to the aging and inadequately sized piping
- to address the deficient Peak Day Demand plus Fire Flow (PDD+FF) many distribution mains throughout the City will need to be upsized
- model results show that the current system does not meet Maximum Day Demand (MDD) design criteria
- high level costs to upgrade identified deficient mains include:

Recommended System Improvements	2020 Cost
Priority System Upgrades	$2,770,000
Downtown District	$9,975,000
Zone 1 area	$9,440,000
Zone 2 area	$14,400,000
Grove Meadows Pressure Zone 3	$455,000
Aspenglen, Fieldstone, Stoneshire Pressure Zone 4	$3,200,000
TOTAL	**$40,240,000**

System Expansion

- this assessment of the City's water distribution system includes accounting for predicted growth areas and end user demands up to a maximum serviced population of 75,000
- the ultimate water system will service the current municipal boundary and potential annexable lands as illustrated in **Figure 5.5**

Regional Water Supply

The Capital Region Parkland Water Services Commission (CRPWSC) provides water to the City of Spruce Grove, Town of Stony Plain and Parkland County. There are two existing supply mains, a 600mm and 300mm diameter suppling potable water sourced by EPCOR and provided by the CRPWSC supply system. The CRPWSC are preparing a third 600mm diameter supply main that is currently under construction and anticipated to be commissioned in 2022. Under agreement, the supply mains directly feed the City of Spruce Grove's Zone 1 Reservoir at a rate of 1.8 x Average Day Demand (ADD), which is currently lower rather than recommended 2.0 x ADD. Three water supply mains combined with the available potable storage capacity of the City's two reservoirs provide an improved level of redundancy in the system.

Zone 1 Pumphouse and Reservoir

- Zone 1 Pumphouse received major upgrades in 2016 that included a new facility with building, pumps and an additional water storage reservoir.
- the distribution pumps have the capacity to:
  - supply Peak Hour Demand (PHD) within Zone 1 and,
  - fill up Zone 2 Reservoir during lower water demand periods each day.
- although the distribution pumps meet current demand, upgrades will be required prior to the predicted demands by 2040
- the Fire Pump (and equivalent back-up only Fire Pump) are located in the Zone 1 Pumphouse and each have the capacity to provide fire flow protection for the Study Area
- Zone 1 Reservoir has adequate storage capacity to meet predicted water demands based on an ultimate servicing population of 75,000 to current servicing design standards

Zone 2 Pumphouse and Reservoir

- Zone 2 Pumphouse received upgrades in 2018 that included the replacement of two (2) distribution pumps
- Zone 2 pumps currently have the capacity to supply Peak Hour Demand (PHD) for Zone 2
- Zone 2 distribution pumps will require reassessment to support growth prior to 2040
- Zone 2 Pumphouse does not incorporate dedicated fire pumps, as emergency Fire Flow Demand (FF) will be supplied to Zone 2 from the Zone 1 Pumphouse
- Zone 2 Reservoir has adequate storage capacity to meet predicted water demands based on an ultimate servicing population of 75,000 to current servicing design standards

End User Operating Pressure

- the City's 2015 Municipal Standards require a minimum residual pressure of 280 kPa (40psi) at ground level during a Peak Hour Demand (PHD) condition.
- Depending on their locale within Zone 2, end users have consistently reported that the water pressure within their home is either:
  - less than 280 kPa (40psi) or
  - greater than 550 kPa (80psi)
- lower than 280 kPa (40psi) conditions are being experienced in the Grove Meadows Neighbourhood
- higher than 550 kPa (80psi) conditions are being experienced along the northern most developments along the south flankage of Highway 16
- to achieve a reasonable end user level of service, the City will be revising the Municipal Development Standards to increase the minimum residual pressure to 350 kPa (50psi) and a maximum of 550 kPa (80psi) during PHD conditions.
- the hydraulic assessment prepared for the study area was completed using the City's revised operating system ranges for Peak Hour Demand conditions
- two (2) additional pressures zones are proposed to modify the distribution system to be able to maintain the updated operating pressure range between 350 kPa (50psi) and 550 kPa (80psi)

Distribution System Pressure Zones

- the current distribution system is comprised of two (2) pressure zones that distinctly divides the system into two servicing zone as:
  - Zone 1 extends from Highway 628 north to approx. 800m north of Highway 16A
  - Zone 2 extends from Highway 16 south to approx. 800m south of Highway 16
  - the system pressure zones are created using six (6) strategically placed Pressure Reducing Valve (PRV) chambers across the distribution system
- two (2) additional pressures zones (Zone 3 and Zone 4) are proposed within the Study Area to be able to maintain an updated operating pressure range between 350 kPa (50psi) and 550 kPa (80psi) throughout the entire system
- fifteen (15) Pressure Reducing Valves (PRV) are required to complete the ultimate distribution system with four (4) pressure zones
  - seven (7) Pressure Reducing Valves (PRV) are required to modify the current distribution system with two (2) pressure zones
  - five (5) additional Pressure Reducing Valves (PRV) are required to be installed with the existing distribution system
  - three (3) additional Pressure Reducing Valves (PRV) are required as development occurs within Pressure Zone 4

Proposed Pressure Zone 3

- some Grove Meadows residents, currently being serviced within the Zone 2 pressure zone, consistently experience lower than 350 kPa (50psi) operating pressures
- Zone 3 has been proposed as a strategy to introduce a new pressure zone isolating a specific portion of the Grove Meadows Neighbourhood
- the exact location of two (2) new Pressure Reducing Valve (PRV) chambers need to confirmed with detailed design
- each of these Pressure Reducing Valves (PRV) will have a set point of 743.0 m HGL.
- to create the required HGL within Zone 3, some mains that connect directly to Zone 2 without the use of a Pressure Reducing Valve (PRV) will need to be isolated by closing two (2) existing system valves

Proposed Pressure Zone 4

- some Spruce Grove residents in the northern areas of the City, currently being serviced within the Zone 2 pressure zone, consistently experience higher than 550 kPa (80psi) operating pressures
- Zone 4 has been proposed south of Highway 16 as a strategy to introduce a new pressure zone in the lowest lying areas of the distribution system
- eight (8) Pressure Reducing Valve (PRV) chambers are required to create Zone 4
  - five (5) Pressure Reducing Valves (PRV) need to be installed within the existing distribution system
  - three (3) Pressure Reducing Valves (PRV) will be required to as development near Highway 16 continues

Leviable Water Distribution Mains and PRV's

- in-line with the City's development policies regarding leviable infrastructure, new distribution mains equal or larger than 400mm in diameter are subject to off-site levies
- High level cost estimates for leviable distribution system infrastructure are proposed per the following table and described in the Water Master Plan

Leviable System Infrastructure	2020 Cost
400mm WM – Spruce Grove East	$3,300,000
400mm WM – South Industrial	$4,400,000
Four (4) Distribution System Pressure Zones	$2,200,000
TOTAL	**$9,900,000**

1.0 Introduction

City of Spruce Grove retained Select Engineering to prepare a new Water Master Plan that encompasses the current development status within the City limits. Immediately adjacent lands currently outside of the City limits are included in the study area as potential growth areas forecasted for development across a 20-year timeline.

Water Master Plans provide insight into a water system's current servicing capacity. By assessing growth trends, current and potential servicing capacity constraints can be identified and addressed with recommended system requirements and planned system expansion.

This Water Master Plan provides:

- review of the current water distribution system
- assessment of the current water system to confirm adequacy to provide the City's level of service standards for the current population and future growth
- identification of system deficiencies
- recommendations for necessary system upsizing/improvements
- a conceptual distribution system backbone to ensure an effective servicing system
- high level cost estimates for preparing planning and budgeting strategies

As a prime contender for growth areas in the Capital Region, this Water Master Plan will help guide the City and local developers with respect to planning, design, and construction of an evolving water distribution system.

As development of the City continues at a steady pace combined with promotion of a more densely populated Downtown core, assurance needs to be in place that the water distribution system and supporting infrastructure can adequately service these areas without delay.

The water distribution system is generally in a stable condition and continues to be expanded and improved to maintain a mandated level of service per the City's development and servicing standards.

Previous Studies and Water Master Plans

- 2002 Water Master Plan Update by Associated Engineering Ltd.; February 2003
- Water Master Plan Update by AECOM; December 2006
- Water Master Plan Update by Select Engineering Consultants Ltd.; November 2015
- Downtown Core Water System Technical Review by Select Engineering Consultants Ltd.; July 2017

Reference Documents

- Water Master Plan Update by Select Engineering Consultants Ltd.; November 2015
- City of Spruce Grove Downtown Watermain Improvements Implementation Plan
- City of Spruce Grove – Municipal Development Standards, 2015;
- Water consumption records (2015 thru 2020) provided by the City of Spruce Grove
- Land Use and projected Development Trends provided by the City of Spruce Grove

1.1 Study Area

The City of Spruce Grove's current municipal boundary is comprised of a land area of approx. 2,620 ha. To account for the City's future growth over the next 20 years, a proposed ultimate servicing area extends to service a total area of 3,200 ha.

Figure 1.1 illustrates the current City limits and servicing study area adopted for this Water Master Plan.

The Water Master Plan study area of 3,200 ha. is bound:

- to the North by Highway 16
- to the East by Range Road 270 and Parkland County
- to the South by Highway 628
- to the West by Town of Stony Plain

Parkland Village

The City of Spruce Grove supplies Parkland Village community with potable water through an extension of the water distribution system crossing Highway 16 along RR 272. According to Parkland County's 2009 municipal census the population was 1,783 with 777 properties.

An assessment of the village's water distribution system or servicing demands were not completed as part of the preparation of this Water Master Plan. Per previous reports, a consistent demand of 10 Lps (liters per second) has been accounted for in the system assessment to account for water supply to Parkland Village.

Parkland Village is a satellite community north of Spruce Grove located at #13, 53222 RR#272 Spruce Grove AB. This mobile home community includes amenities such as a fire hall, community center, elementary school, day care, sports fields, gas bar and convenience store and a restaurant/lounge.

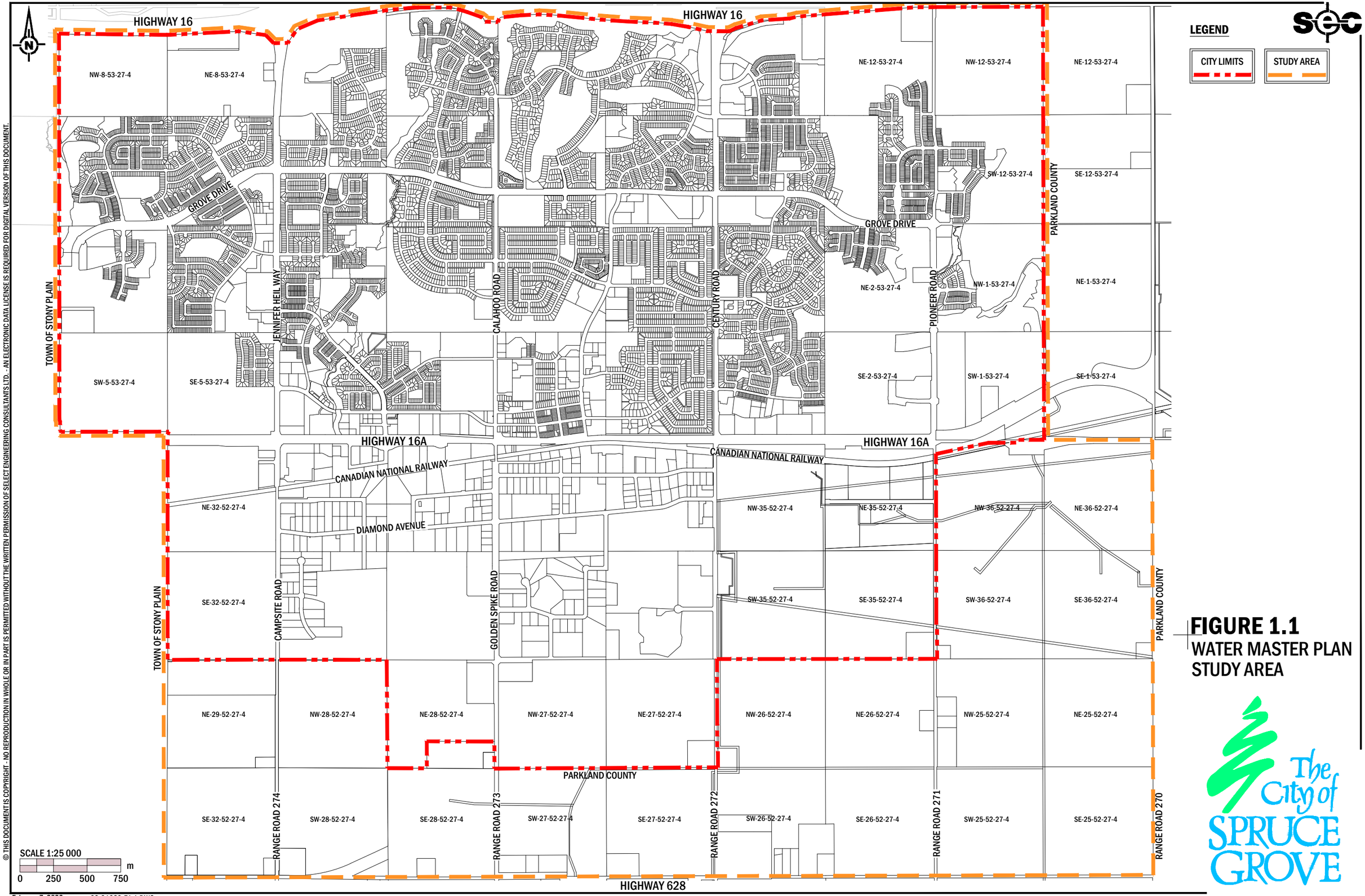

FIGURE 1.1
WATER MASTER PLAN STUDY AREA

The City of SPRUCE GROVE

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2.0 System Requirements

2.1 Land Use and Growth Rate

The City's last census was conducted in 2018 recording a population of 35,766 and has experienced consistent growth of both urban residential and commercial/industrial development for several years.

With respect to the City's water distribution system, growth rates help to predict when key system upgrades will be required, allowing time to develop funding strategies, and forecast the implementation of leviable sources of funding.

User Population

A key variable used to assess the water distribution system capabilities is a review of the current and projected user population.

The City's population:

- is used to formulate the quantity of water required for consumption
- is used to formulate fire protection requirements
- will impact the design peaking factor
- will impact the distribution system to accommodate different land use densities

For the purpose of this Water Master Plan, in agreement with City administration, the full-build out water distribution system will service an ultimate population of 75,000

Historical Growth Rate

An Average Annual Growth Rate (AAGR) of 4.91% was identified in the City's Demographic Report 2018 per **Table 2.1.1**. Similarly, the report also shows an AAGR of 5% for the previous 15 years, between 2003 and 2018.

The population for 2020 was estimated using a growth rate of 5% per annum. A full-build out of the water system could occur within 13 years if the average annual growth rate (AAGR) continues at a consistent 5% per annum. This 13-year projection is similar to the historical doubling of the population seen during a previous 12-year span between 2006 and 2018.

For the purpose of this Water Master Plan, and in agreement with City administration, growth rates used for this assessment are based on an average annual growth rate (AAGR) of 5% for the next 10 years followed by an annual growth rate of 2% until achieving the ultimate population of 75,000 in 2045. If projected population growth rates decrease, key system upgrades and system improvements could be postponed or re-strategized as required.

Table 2.1.1: Average Annual Growth Rate (2014-2018)

Year	Population (by consensus)	Annual Growth (%)
2014	29,526	
2015	32,036	8.5
2016	33,640	5.01
2017	34,881	3.69
2018	35,766	2.54
5 Year Annual Average Growth Rate		**4.91**

The population projection identified in **Table 2.1.2** represents the basis for the preparation of this Water Master Plan.

Table 2.1.2: Projected Growth to Ultimate System Build-Out

Year	Timeline	Annual Growth (%)	Projected Population
2020	-	5.0	39,432
2025	5 years	5.0	50,326
2035	15 years	2.0	61,348
+ 2045	+ 25 years	+2	+75,000

Growth rates should be reviewed within 5 years (2025) to confirm actual AAGR and re-assess any required updates to reflect development conditions and strategies at that time.

Growth Rate Considerations

A relatively short time frame of 25 years for ultimate system build-out may be improbable for reasons that include:

- the majority of the previous 20 years of growth has occurred north of Highway 16A where the water distribution network is well established
- multiple system connections north of Highway 16A are prevalent as neighbourhoods expand and extend servicing, allowing for development of several neighbourhoods across the north half the City simultaneously
- residential land uses north of Highway 16A are approaching full build-out which may result with decreased development per annum until additional water distribution networking south of Highway 16A are constructed
- majority of remaining undeveloped residential land uses are south of Highway 16A
- the current water distribution network south of Highway 16A is not as diverse with limited distribution network connections in place
- servicing the future residential land uses south of Highway 16A will require that the current distribution network be extended east of Century Road and provide multiple servicing connections that allow simultaneous development of the lands to maintain an AAGR of 5% (ensure multiple watermain connections are available for developers to extend from)
- opposingly, as the remaining northern developable lands with the City reach full-built, fewer opportunities become available for multiple developments to be constructed simultaneously (less watermain stubs to connect to)
- promote can be realized for developments currently experienced in the north half of the City
- initial expansion of the watermain system to service residential land uses south of Highway 16A will trigger additional servicing costs that may impact private development strategies and timelines for development

Land Uses

Although water usage is directly influenced by community growth, demands are not accurately determined from population data alone. These include Land Use designations and their respective design population densities, design water usage per capita and fire protection requirements are used to formulate projected water system demands.

Land Uses and respective water demands were adopted from the City's current design and servicing standards for the preparation of this Water Master Plan and outlined in **Table 2.1.3**.

Table 2.1.3: Land Use Water Demand Criteria

Land Use	User Daily Usage (l/c/d)	Minimum Fire Flow (l/s)
Residential – Single Family	300	100
Residential – Multi-Family	300	180
Commercial	-	300
Industrial	-	300
Institutional	-	300

Figure 2.1 identifies the City of Spruce Grove's current and forecasted Land Use Designations

HIGHWAY 16

HIGHWAY 16

NW-8-53-27-4

NE-8-53-27-4

NE-12-53-27-4

NW-12-53-27-4

NE-12-53-27-4

SW-12-53-27-4

SE-12-53-27-4

GROVE DRIVE

GROVE DRIVE

PARKLAND COUNTY

TOWN OF STONY PLAIN

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

NE-2-53-27-4

NW-1-53-27-4

NE-1-53-27-4

SW-5-53-27-4

SE-5-53-27-4

SE-2-53-27-4

SW-1-53-27-4

SE-1-53-27-4

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAILWAY

NE-32-52-27-4

NW-35-52-27-4

NE-35-52-27-4

NW-36-52-27-4

NE-36-52-27-4

DIAMOND AVENUE

TOWN OF STONY PLAIN

CAMPSITE ROAD

GOLDEN SPIKE ROAD

SE-32-52-27-4

SW-35-52-27-4

SE-35-52-27-4

SW-36-52-27-4

SE-36-52-27-4

PARKLAND COUNTY

NE-29-52-27-4

NW-28-52-27-4

NE-28-52-27-4

NW-27-52-27-4

NE-27-52-27-4

NW-26-52-27-4

NE-26-52-27-4

NW-25-52-27-4

NE-25-52-27-4

PARKLAND COUNTY

SE-32-52-27-4

SW-28-52-27-4

SE-28-52-27-4

SW-27-52-27-4

SE-27-52-27-4

SW-26-52-27-4

SE-26-52-27-4

SW-25-52-27-4

SE-25-52-27-4

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

SCALE 1:25 000

0 250 500 750 m

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LEGEND

	DEVELOPED	UNDEVELOPED
CITY LIMITS		
STUDY AREA		
RESIDENTIAL	RESIDENTIAL	
COMMERCIAL	COMMERCIAL	
INDUSTRIAL	INDUSTRIAL	
INSTITUTIONAL	INSTITUTIONAL	
PARK / SWMF	PARK / SWMF	
GOLF COURSE		

FIGURE 2.1
WATER MASTER PLAN
LAND USE

The City of SPRUCE GROVE

2.2 Design Criteria

The development and assessment of municipal water distribution systems include determining the end user water consumption population. Allowances for increased system demands that typically occur daily include:

- the few AM hours before people travel to work and
- the few PM hours after people arrive home from work

Water demand generally follows this daily usage pattern and can vary between weekdays and weekends due to varied activities throughout the user population.

Demand generalities for urbanized communities include:

- Monday thru Friday peak demands are consistent with their respective AM and PM peak times
- Saturday and Sunday peak demands are consistent with their respective AM and PM peak times
- weekdays and weekends will have different peak demands
- any single day may be the highest user day of the week

Water demand design criteria influences the sizing, performance, and adequacy of a distribution system. Water usage records, hydrant flow tests and operating history were reviewed to confirm that the City's current design criteria is meeting community needs.

The design criteria used to prepare this Water Master Plan have been adopted from the following sources:

- Municipal Development Standards, 2015 – City of Spruce Grove
- Water consumption record data, 2015 to 2020 – City of Spruce Grove
- Water Master Plan Update, 2015 - City of Spruce Grove
- Alberta Environment Standards and Guidelines for "Municipal Waterworks, Wastewater and Storm Drainage Systems", 2012 (Revised 2021)
- Water Supply for Public Fire Protection - Fire Underwriters Survey
- Communication and direction from City of Spruce Grove

The City of Spruce Grove's current water distribution system design and water demand criteria are outlined in the 2015 edition Municipal Development Standards.

Comparable Municipal Design Criteria

Water system design criteria adopted by similar sized municipalities within the Capital Region were reviewed for comparison to the City of Spruce Grove's current design standards for new development and system assessment. The City's design criteria are in-line or more conservative than regional municipalities and appear to adequately represent the level of service mandated by the City of Spruce Grove. The following tables provide a summary of water demand design criteria used by similar level of service communities within the Capital Region.

Table 2.2.1: Water Demand Criteria

Municipality	Average Day Demand (litres/capita/day)	Peak Day Factor	Peak Hour Factor
Edmonton	220	1.5	3.0
Leduc	250	1.8	3.0
Spruce Grove	**300**	**2.0**	**3.0**
Stony Plain	300	2.0	3.0
Strathcona County	300	2.0	3.0
Parkland County	350	2.0	3.0
St. Albert	350	2.0	4.0

Table 2.2.2: Fire Flow Criteria

Municipality	Residential (l/s)	Multi-Family (l/s)	Comm/Ind Institutional (l/s)
Parkland County	60	90-115	230
Stony Plain	83-100	133-183	233-317
St. Albert	-	-	300
Spruce Grove	**100**	**180**	**300**
Strathcona County	100	180	250
Edmonton	100	180	300
Leduc	115	227	227

Table 2.2.3: Pressure Range Criteria

Municipality	Min. Operating Pressure kPa (psi)	Max. Operating Pressure kPa (psi)
Edmonton	280 (40)	700 (100)
Leduc	280 (40)	570 (83)
Stony Plain	280 (40)	550 (80)
Parkland County	280 (40)	550 (80)
Spruce Grove	**350 (50)**	**550 (80)**
St. Albert	350 (51)	700 (100)
Strathcona County	350 (51)	700 (100)

The 2015 Municipal Development Standards does not recommend a maximum operating pressure. In agreement with the City of Spruce Grove, the maximum operating pressure of 550 kPa (80psi) has been adopted into the system design criteria.

Water Demands

Water demand is critical to determine:

- distribution network extension strategies
- identify system deficiencies and required upgrades
- assess pump system requirements
- to develop a staging plan for potable water storage expansion

There are three (3) critical water demand rates used to identify the minimum level of service requirements:

- Average Day Demand - ADD
- Maximum Day Demand - MDD
- Peak Hour Demand - PHD

Average Day Demand (ADD)

The Average Day Demand (ADD) is determined by dividing the total annual consumption by 365 days. Potable water consumption records from 2016 to 2020 were provided by the City of Spruce Grove and used to determine the ADD. Water consumption records are included for reference in **Appendix A**.

The analysis of the consumption records identified a calculated Average Day Demand (ADD) of approximately 224 l/c/d. This historical Average Day Demand (ADD) is within the minimum design criteria of 300 l/c/d and confirms a conservative design methodology.

In agreement with the City of Spruce Grove, an ADD water demand of **300 l/c/d** will remain as the design criteria for water demand requirements.

Maximum Day Demand (MDD)

The Maximum Day Demand (MDD) represents water consumption observed in the distribution system during a single day. The Maximum Day Demand (MDD) is used to determine the delivery capacity required for:

- reservoirs
- supply mains
- pumphouse facilities

Based on the water usage records provided, a Peaking Factor (ratio of maximum day flow to average day flow) varies between a 1.29 to 2.5. This range of peaking factor values is considered within the typical recommended peak day factors adopted by other municipalities.

For the purpose of this Water Master Plan, a Peaking Factor of 2.0 has been used.

Therefore: MDD = ADD x 2.0

Peak Hour Demand (PHD)

The Peak Hour Demand (PHD) is the expected maximum water demand observed during a short period of the day. Most facilities are not equipped to record peak hour demands, therefore the Peak Hour Demand (PHD) rate is established based on experience and educated judgment. The Peak Hour Demand (PHD) rate influences design requirements of the water distribution mains and pumping requirements.

For the purpose of this Water Master Plan, a peaking factor of 3.0 has been used.

Therefore: PHD = ADD x 3.0

Fire Flow (FF)

Fire Flow (FF) is defined as the minimum flow required to be available at any location within the distribution system for firefighting emergencies.

Per the City's 2015 Municipal Development Standards, water distribution design criteria require that a minimum fire flow of 300 L/s (equivalent to 18,000 L/min) be achievable to service commercial, industrial, and institutional properties.

The Water Master Plan assessment has been prepared using a minimum Fire Flow (FF) rates per the City's 2015 Municipal Servicing Standards. Different Fire Flow (FF) rates are used to for different land use designations within the City.

Fire Flow (FF) rates used to prepare this Water Master Plan include:

+	Single Family	100 L/s
+	Multi Family	180 L/s
+	Industrial	300 L/s
+	Commercial, Institutional	300 L/s

Fire Underwriters Guidelines – Site Specific Fire Flow

An additional Fire Flow evaluation formula was required by the City of Spruce Grove using the current Fire Underwriter's Guidelines. This information has been included in the body of this Water Master Plan for reference to specific site developments only and is not included as a design guideline with respect to the City's distribution system.

The following Fire Underwriters Guidelines are meant to evaluate site designs and building permitting within the City of Spruce Grove.

$F = 220\ c\ \sqrt{A}$ where:

F = required fire flow in liters per minute
C = 1.5 for wood frame construction
= 1.0 for ordinary construction
= 0.8 for non-combustible construction
= 0.6 for fire flow resistant construction (fully protected frame, floors and roof)
A = total floor area in square meters (including all stories)

Other considerations when determining site specific fire flow requirements include:

- occupancy hazard
- automatic sprinkler protection
- fire resistant construction materials
- exposure within 45 meters

As per the Fire Code, any development, prior to the commencement of construction, shall have a Fire Safety Plan that includes all the procedures to be followed in the event of a fire.

All Fire Safety Plans must to be accepted in writing by the City of Spruce Grove Fire Department.

Fire Hydrants

Planning fire hydrant locations should be a cooperative effort between the Engineer and the City of Spruce Grove Fire Department authority.

The following **Table 2.2.4** provides a summary of the fire hydrant spacing requirements adopted from the City of Spruce Grove 2015 Municipal Servicing Standards and the Fire Underwriters Survey.

Table 2.2.4: Hydrant Spacing

Description	City of Spruce Gove	Fire Underwriters Survey
Single Family Residential	150 (75 m radius)	180 (90 m radius)
Multi Family	120 (60 m radius)	90 (45 m radius)
Commercial/Industrial	120 (60 m radius)	90 (45 m radius)

Figure 2.2 illustrates the City's current hydrant coverage and highlights any deficient areas.

Hydrants shall conform to American Water Works Standards for Dry Barrel Fire Hydrants or Underwriters' Laboratories of Canada listing. Hydrants shall have minimum two 65 mm outlets and a large pumper outlet.

HIGHWAY 16

HIGHWAY 16A

HIGHWAY 628

TOWN OF STONY PLAIN

PARKLAND COUNTY

GROVE DRIVE

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

CANADIAN NATIONAL RAILWAY

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

NW-8-53-27-4 | NE-8-53-27-4 | NE-12-53-27-4 | NW-12-53-27-4 | NE-12-53-27-4

SW-12-53-27-4 | SE-12-53-27-4

NE-2-53-27-4 | NW-1-53-27-4 | NE-1-53-27-4

SW-5-53-27-4 | SE-5-53-27-4 | SE-2-53-27-4 | SW-1-53-27-4 | SE-1-53-27-4

NE-32-52-27-4 | NW-35-52-27-4 | NE-35-52-27-4 | NW-36-52-27-4 | NE-36-52-27-4

SE-32-52-27-4 | SW-35-52-27-4 | SE-35-52-27-4 | SW-36-52-27-4 | SE-36-52-27-4

NE-29-52-27-4 | NW-28-52-27-4 | NE-28-52-27-4 | NW-27-52-27-4 | NE-27-52-27-4 | NW-26-52-27-4 | NE-26-52-27-4 | NW-25-52-27-4 | NE-25-52-27-4

SE-32-52-27-4 | SW-28-52-27-4 | SE-28-52-27-4 | SW-27-52-27-4 | SE-27-52-27-4 | SW-26-52-27-4 | SE-26-52-27-4 | SW-25-52-27-4 | SE-25-52-27-4

N

S

SCALE 1:25 000

0 250 500 750 m

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LEGEND

- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- EX NORTH/SOUTH PUMP HOUSE (N / S)
- EX 100mm WATERMAIN
- EX 350mm WATERMAIN
- EX 150mm WATERMAIN
- EX 400mm WATERMAIN
- EX 200mm WATERMAIN
- EX 450mm WATERMAIN
- EX 250mm WATERMAIN
- EX 500mm WATERMAIN
- EX 300mm WATERMAIN
- EX 600mm WATERMAIN
- EX 750mm WATERMAIN
- FIRE HYDRANT 60m RAD
- PROPOSED HYDRANT 60m RAD
- FIRE HYDRANT 75m RAD

TOTAL EXISTING HYDRANTS = 1032

TOTAL PROPOSED HYDRANTS = 43

FIGURE 2.2
WATER MASTER PLAN HYDRANT COVERAGE

The City of SPRUCE GROVE

Operating System Pressure

The City Spruce Grove 2015 Municipal Standards require a minimum residual pressure of 280 kPa (40psi) at ground level during Peak Hour Demand (PHD) conditions.

However, as per City administration direction, the hydraulic assessment within this report was completed based on a minimum **350 kPa (50psi)** residual pressure during peak hour conditions.

Therefore, to achieve maximum user satisfaction, the recommended operating pressure in the system has been updated to reflect pressures between 350 kPa (50 psi) and 550 kPa (80 psi). Higher system pressures above 550 kPa (80psi) are not recommended due to increased risk of system leakage, increased probability of mechanical failure of system fittings and hydraulically operated equipment, and increased maintenance and associated costs.

The recommended range of system pressures for end users are:

- minimum system pressure 350 kPa (50psi)
- maximum system pressure 550 kPa (80 psi)

The minimum system pressure to be maintained during a fire emergency are:

- minimum system pressure 140 kPa (20psi)
- minimum pressure at demand hydrant 140 kPa (20 psi)

Distribution Main Sizing

The minimum recommended pipe diameters within the water distribution network are:

- residential cul-de-sac without hydrant 100mm diameter
- single family residential (except cul-de-sac) 200mm diameter
- commercial, industrial, and institutional 250mm diameter

The 2015 Municipal Development Standards require all cul-de-sacs exceeding **170m** in length require looping of the distribution main.

Distribution Main Materials

All new watermains are to be PVC material per the City of Spruce Grove 2015 Municipal Standards.

100mm to 300mm diameter :	AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings
350mm to 1,200mm diameter:	AWWA C905 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings

Pipe Material Coefficients

For analysis of the existing distribution network the following pipe materials have been identified with their respective "c" coefficients to reflect internal flow conditions throughout the system.

The following coefficient values have been adopted from the City's previous Water Master Plan assessments.

Table 2.2.5: Pipe Material "c" Coefficients

Pipe Material	"c"
Poly Vinyl Chloride (PVC)	120
Asbestos Cement (AC)	110
Cast Iron (CI)	110
Ductile Iron (DI)	110
Steel (STL)	120
Concrete Pressure Pipe (CPP)	120

Flow Velocity

The flow velocity within the distribution system is an important design element to mitigate sudden changes in system velocity can create the potential for a pressure surge causing a negative pressure situation within the system. This situation produces a water hammer impact that increases the risk for critical failures in the system including broken mains, fittings, pumps, valves, etc.

The recommended maximum velocities within the water distribution system include:

- 1.5 m/s for supply mains
- 3.0 m/s distribution mains under normal operation
- 3.0 m/s during fire flow conditions

Water Consumption

Previous Water Master Plans assumptions concluded that Zone 1 uses 40% of the total water consumption and Zone 2 uses 60% of the total water consumption. This consumption criteria were adopted to represent the current distribution system analysis provided for this Water Master Plan. The following tables summarize the projected water demand for the City of Spruce Grove.

Table 2.2.6: Zone 1 Projected Consumption

Year	Equivalent Population	ADD (l/s)	MDD (l/s)	PHD (l/s)
2020	15,773	47.46	113.15	138.61
2025	20,131	69.90	139.80	209.69
2035	24,539	85.20	170.41	225.61
+ 2045	30,000	104.17	208.33	312.50

Table 2.2.7: Zone 2 Projected Consumption

Year	Equivalent Population	ADD (l/s)	MDD (l/s)	PHD (l/s)
2020	23,659	71.20	169.72	207.91
2025	30,196	104.85	209.69	314.54
2035	36,809	127.81	255.61	383.42
+ 2045	45,000	156.25	312.50	468.75

Table 2.2.8: Parkland Village Projected Consumption

Year	2020	2025	2030	2040	2050	Ultimate
MDD (l/s)	10	10	10	10	10	10

The projected total water demand for the entire City is summarized in the following table:

Table 2.2.9: City of Spruce Grove Projected Consumption

Year	ADD (l/s)	MDD (l/s)	PHD (l/s)
2020	129.57	292.27	356.52
2025	184.74	359.49	534.23
2035	223.01	436.02	649.03
+ 2045	270.42	530.83	791.25

NOTE: Parkland Village water consumption is included in the total projected water demand for the City of Spruce Grove per Table 2.2.9

Potable Water Storage

Potable water storage is required to ensure consistent and continuous source of water to the distribution system. In a water distribution system, it is necessary to provide adequate storage volumes of water for operational needs, peak hour conditions, emergency fire flow demands, and water supply interruptions.

Design guidelines to determine adequate storage capacity for a system vary and are based on the characteristics of the water distribution system, the size of the community and the capital cost involved. An over-abundance of storage capacity can potentially cause risk for degradation of potable water quality for insufficient water turnaround.

Alberta Environment Protection (AEP) guidelines require the following elements be combined to account for a reservoir's required storage capacity.

+	Equalization storage (PHD)	25% of maximum daily flow
+	Emergency storage	15% of Average Day Demand
+	Fire Storage	300 L/s for 4 hours duration

The City of Spruce Grove is a member of the Regional Water Customer Group (RWCG) who also recommend minimum storage design criteria.

Zone 1 Reservoir is supplied by the Capital Region Parkland Water Services Commission (CRPWSC) at a rate of **1.8 times Average Day Demand** (ADD)

Note: a rate of 2.0 times Average Day Demand (ADD) is referenced in the City's 2015 Municipal Development Standards

Water reservoirs / storage facilities supplied by long distance water sources are considered a higher risk for supply interruption. Communities, including the City of Spruce Grove that are serviced by regional water pipelines are considered high risk for external stakeholder supply interruptions that our not within the City of Spruce Grove' control. To help reduce risk and mitigate potential non-supply circumstances, the recommended reservoir storage facilities are designed to accommodate twice the Average Day Demand plus Fire Storage.

Therefore: minimum Reservoir Capacity = (ADD X 2) + (300 L/s x 4 hours)

The City of Spruce Grove's water distribution system includes two (2) potable water reservoirs. Each of the reservoirs work in conjunction with their respective pumphouse. The Zone 1 Reservoir is located at the Zone 1 Pumphouse that services the south half of the city. The Zone 2 Reservoir is located at the Zone 2 Pumphouse and services the north half of the city.

The water supply is expected to gain additional flow capacity and an increased level of redundancy when the Capital Region Parkland Water Services Commission (CRPWSC) commission a third supply main in 2022.

The following tables summarize the City's potable water storage requirements.

Table 3.10: South Reservoir Storage - Zone 1

Description	Year (volume- m3)			
	2020	2025	2035	+ 2045
Fire Storage (300 l/s for 4.0 hours)	4,320	4,320	4,320	4,320
Emergency Storage (2 x ADD)	8,966	12,078	14,724	17,948
Total Storage Required	**13,286**	**16,398**	**19,044**	**22,268**

Table 3.11: North Reservoir Storage - Zone 2

Description	Year (volume- m3)			
	2020	2025	2035	+2045
Fire Storage (300 l/s for 4.0 hours)	-	-	-	-
Emergency Storage (2 x ADD)	13,449	18,117	22,085	26,922
Total Storage Required	**13,449**	**18,117**	**22,085**	**26,922**

Excess water storage from reservoir in Zone 1 can supplement the additional water demand and storage required for Zone 2. The required fire flow volume is stored in South reservoir (Zone 1), as only one reservoir is required to store the fire flow. The following table represents a summary of the required water storage volume for the combined two (2) zones based on the CRPWSC:

Table 3.12: Total Reservoir Storage

Description	Year (volume- m3)			
	2020	2025	2035	+2045
South Reservoir	13,286	16,398	19,044	22,268
North Reservoir	13,449	18,117	22,085	26,922
Total Storage Required	**26,735**	**34,515**	**41,129**	**49,190**
Existing Available Storage*	**49,819**			
Assessment	**OK**	**OK**	**OK**	**OK**

*Existing Available Storage = South Storage Reservoir capacity plus North Storage Reservoir capacity ($43{,}000m^3 + 6{,}819m^3 = 49{,}819m^3$)

The above table shows that the existing water storage reservoirs have sufficient capacity to service the City of Spruce Grove based on the ultimate population projection. However, the existing reservoirs available capacity will need to be reassessed if the City's projected population growth rate changes.

3.0 Current System

Potable Water System Overview

The City of Spruce Grove current water distribution system consists of the following key components:

- Water Distribution Mains
- Regional Supply Mains (operated by CRPWSC)
- Zone 1 Pumphouse and Reservoir
- Zone 2 Pumphouse and Reservoir
- Pressure Reducing Valves

Figure 3.1 identifies the City's current overall water system.

Water Distribution Mains

The water distribution system has a network of distribution mains consisting of various main sizes ranging between 100mm and 750mm diameter, as well as different materials including asbestos cement (AC), cast iron (CI) and polyvinylchloride (PVC).

- the current water distribution pipe sizes are illustrated on **Figure 3.1**
- the current water distribution pipe materials are illustrated on **Figure 3.2**

A piping summary for each neighbourhood's water distribution mains were extrapolated from data provided from City of Spruce Grove GIS database records are listed in **Table 3.1.1** for reference.

Table 3.1.1: Distribution Main Summary

Neighbourhood	Diameter (mm)	Length (m)	Material (%)	Average Age (years)
Aspenglen	100	324	100% PVC	15
	150	760		20
	200	5,607		14
	250	319		5
	300	1,347		13
Brookwood	50	56	1% Copper 5% Cast Iron 94% PVC	25
	150	367		**38**
	200	5,423		13
	250	806		15
Broxton Park	100	171	16% Cast Iron 84% PVC	15
	150	1,327		**36**
	200	4,667		5
	250	23		35

Neighbourhood	Diameter (mm)	Length (m)	Material (%)	Average Age (years)
Century Crossing	250	174	100% PVC	25
	300	120		14
City Center	150	4,781	32% PVC 68% AC	**52**
	200	465		22
	250	556		26
	300	2,216		12
Copperhaven	200	835	100% PVC	3
	250	162		3
	300	466		3
Deer Park	100	47	100% PVC	15
	150	171		17
	200	3,326		17
	300	1,749		15
Fenwyck	200	1,013	100% PVC	3
	300	531		3
Fieldstone	150	568	100% PVC	**35**
	200	281		25
	250	588		**35**
Greenbury	100	261	100% PVC	7
	200	3,213		7
	300	877		8
Grove Meadows	150	1,021	100% PVC	**41**
	200	2,307		7
	250	2,908		31
Grove Seniors Village	150	427	100% PVC	25
	200	444		25
Harvest Ridge	100	174	100% PVC	8
	150	52		15
	200	5,900		12
	250	1,955		7
	300	1,992		11
Heatherglen	100	168	100% PVC	11
	200	3,772		19
	300	1,016		17
Heritage Creek	150	66	100% PVC	8
	200	890		8
Hilldowns	100	131	100% PVC	4
	150	231		20
	200	2,126		13
	250	1,451		12
	300	1,230		13
Industrial South of Highway 16A	150	1,222	8% Cast Iron 12% AC 35% HDPE 46% PVC	**35**
	200	2,501		**39**
	250	11,047		**28**
	300	2,431		6
	350	35		**45**
	400	4,753		5

Neighbourhood	Diameter (mm)	Length (m)	Material (%)	Average Age (years)
Kenton	200	1,913	100% PVC	6
	300	414		7
Lakewood	50	11	100% PVC	15
	150	571		20
	200	2,196		19
	250	2,752		20
	300	740		21
Legacy Park	100	53	100% PVC	15
	150	79		15
	200	1,299		15
Linkside	150	473	7% HDPE 93% PVC	22
	200	1,324		20
	250	1,839		18
	300	68		15
McLaughlin	100	209	100% PVC	7
	200	2,604		7
	250	749		8
	300	941		10
Millgrove	100	128	6% No Record 40% AC 55% PVC	**45**
	150	954		16
	200	5,328		22
	250	824		**45**
	300	83		25
Mobile City Estates	50	308	12% Copper 18% PVC 70% Cast Iron	**45**
	150	1,315		**45**
	200	421		**45**
	300	438		15
Prescott	100	190	100% PVC	3
	150	29		3
	200	1,299		8
	250	37		8
	300	1,367		7
Spruce Ridge	100	146	100% PVC	8
	150	54		7
	200	3,156		11
	250	1,634		12
	300	379		14
Spruce Village	100	89	100% PVC	15
	150	45		15
	200	3,603		15
	250	167		15
	300	2,999		15

Neighbourhood	Diameter (mm)	Length (m)	Material (%)	Average Age (years)
Stoneshire	50	41	100% PVC	8
	75	88		8
	100	190		8
	150	323		26
	200	2,763		18
	250	2,347		18
Tonewood	100	70	100% PVC	3
	200	1,534		4
	250	581		5
Westgrove	50	153	2% Copper 5% PVC 93% AC	31
	150	2,754		**40**
	200	1,589		**41**
	250	521		**39**
Westgrove Commercial	150	174	6% AC 94% PVC	27
	200	2,384		32
	250	1,310		29
	300	398		15
Westwind	200	13	100% PVC	3
	250	208		3
	300	61		3
Woodhaven	150	2,732	1% AC 42% PVC 57% No Record	**45**
	200	2,601		26
	250	1,833		**38**

Average Age Years greater than 34 years are **BOLD** for reference.

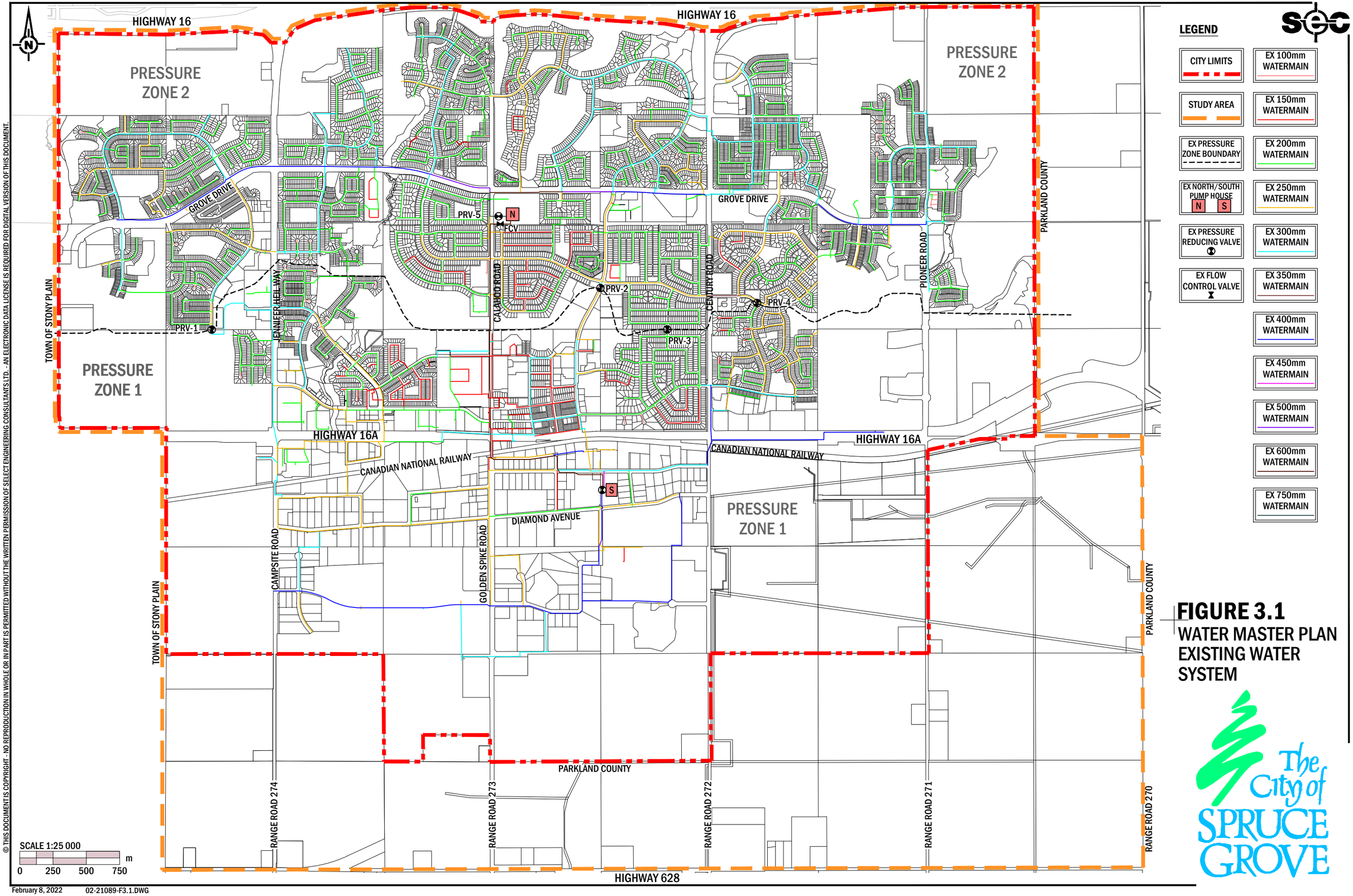

FIGURE 3.1
WATER MASTER PLAN EXISTING WATER SYSTEM

The City of SPRUCE GROVE

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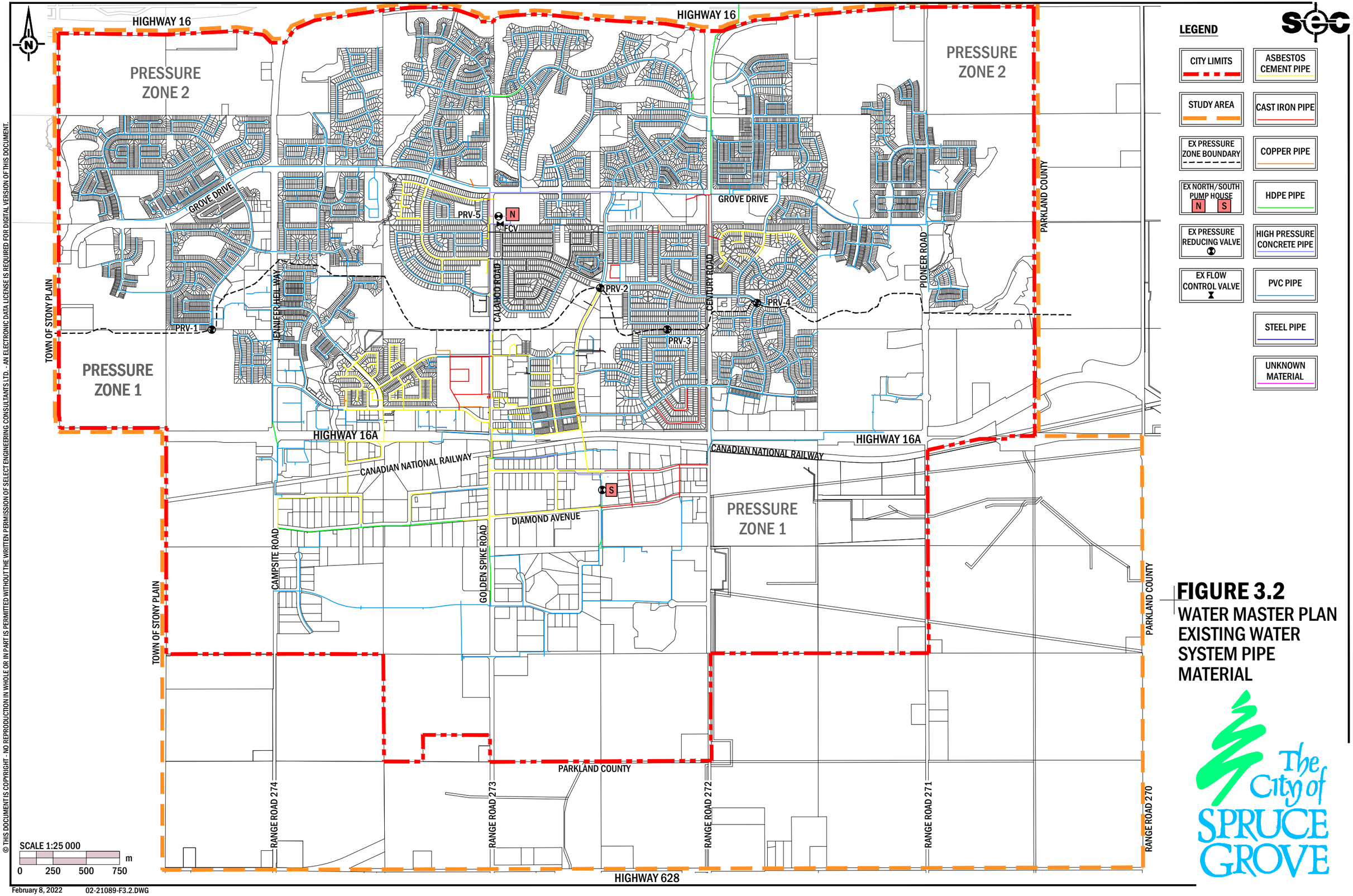

FIGURE 3.2
WATER MASTER PLAN EXISTING WATER SYSTEM PIPE MATERIAL

The City of SPRUCE GROVE

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3.1 Regional Water Supply

The Capital Region Parkland Water Services Commission (CRPWSC) provides water to the City of Spruce Grove, Town of Stony Plain and Parkland County. Two transmission water mains, 600 mm and 300 mm diameter supply potable water from Edmonton (EPCOR) to the commission. A third 600 mm diameter transmission water main is currently under construction and anticipated to be completed in 2022.

The supply mains feed the South Storage Reservoir in Zone 1 located between South Avenue and Diamond Avenue, north of Schram Street. The water supply mains are owned and operated by the CRPWSC. Direct connections from their water supply mains to the City's water distribution system are not permitted.

The City's current agreement with CRPWSC specifies that the transmission mains can supply up to 1.8 x the City's Average Day Demand (ADD). When the peak day demand exceeds 1.8 x ADD, the shortage in water volume is supplemented by the storage capacity in Zone 1 and Zone 2 water reservoirs. The following table, provided by CRPWSC, summarizes the projected water demand supplied to the City of Spruce Grove.

Table 3.1.2: CRPWSC Projected Water Supply (sourced data)

Year	City of Spruce Grove		WILD		Total Peak Day
	ADD, L/s	PDD, L/s	ADD, L/s	PDD, L/s	
2020	108.06	194.44	10.56	19.17	213.61
2025	125.28	225.56	16.94	30.28	255.84
2030	145.28	261.39	20.56	37.22	298.61
2040	195.28	351.39	31.11	55.83	407.22
2045	226.11	407.22	38.06	68.33	475.55

The WILD Water Commission (West Inter Lake District Regional Water Services Commission) is comprised of 19 participating municipalities including Parkland County, Lac Ste. Anne County, Town of Onoway, Village of Alberta Beach, Village of Wabamun, several summer villages and Alexis Nakota Sioux Nation and Paul First Nation.

3.2 Zone 1 Pumphouse and Reservoir

The Zone 1 Pumphouse and Reservoir received major upgrades in 2016. The upgrades included the construction of a new Pumphouse, complete with new pumps and an additional water storage reservoir. These major upgrades are summarized below:

- three (3) Duty Pumps - Vertical Turbine Distribution Pumps
  - identified as P-001, P-002 and P-003
  - all three pumps are to be controlled with variable speed drives to maintain a set operating pressure of 420 kPa within the water distribution system in Zone 1
  - pumps P-001 and P-002 operate in parallel during Average Day Demand (ADD)
  - all three pumps, P-001, P-002, P-003 will operate to manage Maximum Day Demand (MDD) and Peak Hour Demand (PHD)
- two (2) Fire Pumps - Fixed Speed Pumps
  - identified as P-004, P-005
  - each fire pump will maintain a 300 L/s during Fire Flow Demand (FF)
  - only one pump will operate, the second pump is 100% backup

Pump curves for each of the pumps are attached in **Appendix B** for reference. The pump descriptions and capacities are summarized in the following tables:

Table 3.1.3: Zone 1 Distribution Pump Flow Capacities

Pump ID	Description	Design Capacity (l/s)	Total Dynamic Head (m)	Hydraulic Grade Line (m)
P-001	92-P-001 Fairbanks Morse	96	46.00	756.58 (420 kPa)
P-002	92-P-002 Fairbanks Morse	96	46.00	756.58 (420 kPa)
P-003	92-P-003 Fairbanks Morse	152	46.00	756.58 (420 kPa)
P-001+ P-002 + P-003		**344**	**46.00**	**756.58 (420 kPa)**

Table 3.1.4: Zone 1 Fire Pump Flow Capacities

Pump ID	Description	Design Capacity (l/s)	Total Dynamic Head (m)	Hydraulic Grade Line (m)
P-004	92-P-004 Fairbanks Morse	300	46.00	756.58 (420 kPa)
P-005	92-P-005 Fairbanks Morse	300	46.00	756.58 (420 kPa)

Zone 1 Operating Philosophy

The operating pressure at the South Pumphouse is set at 420 kPa (61 psi) and controlled by a pressure reducing valve located within the pumphouse. The distribution pumps are set to start automatically in sequence based on the operating pressure within the water distribution system.

The lead pump is P-001 (100 HP) variable speed pump. When this pump cannot sustain the system pressure, a second pump, P-002 (100 HP) will start. When the two pumps cannot sustain the pressure, the third pump, P-003 (125 HP) will start. All three pumps have the capability to operate together until the water demand decreases and the pumps will start to throttle down and stop.

Table 3.1.5: Zone 1 Pump Operating Philosophy

Pump ID	Design Capacity (l/s)	Status	Design Capacity (l/s)
P-001	96	ON	0 to 96 l/s
P-002	96	ON	97 to 192 l/s
P-003	152	ON	193 to 344 l/s

Zone 1 Potable Water Reservoir

In 2016, the water storage reservoir was expanded from two (2) storage cells to three (3) cells. Each of the cells are buried concrete structures with the following storage capacities:

Table 3.1.5: Zone 1 Reservoir Storage Capacity

Description	Volume (m3)
Cell No.1	9,000
Cell No.2	14,000
Cell No. 3	20,000
Zone 1 Total Available Storage	**43,000**

3.3 Zone 2 Pumphouse and Reservoir

The Zone 2 Pumphouse and Reservoir are located east of Calahoo Road and south of Grove Drive. In 2018, two (2) of the existing distribution pumps, P-3 and P-4 were replaced. The Aurora 12AC8 vertical turbine pumps were replaced with new Goulds 11 CMC vertical turbine pumps.

The Zone 2 Pumphouse facility includes the following pumps:

- four (4) distribution pumps, P-1, P-2, P-3, and P-4
  - pumps P-1 and P-2 act as jockey pumps
  - P-1 or P-2 cycle when the water demand is between 0 L/s and 42 L/s
  - when flow increases to 43 L/s, both P-1 and P-2 pumps are ON
  - pump P-3 will start running when water demand increases to 95 L/s
  - pump P-4 has the same capacity as Pump P-3 and is for 100 % backup
- two (2) Fire Pumps, FP-1 and FP-2
  - pumps FP-1 and FP-2 are natural gas driven engine (Cummins G-495)

Although the City's fire flows are maintained from the Zone 1 Pumphouse, the following fire pump operating philosophy is summarized as:

- FP-1 is a standby pump and can only be started manually
- FP-2 is the standby power fail engine/pump
- In the event of a power fail or emergency event, FP-2 can be remotely started from the Firehall

Table 3.1.6: Zone 2 Distribution Pump Flow Capacities

Pump ID	Description	Status	Design Capacity (l/s)	Total Dynamic Head (m)	Hydraulic Grade Line (m)
P-1	Goulds 11CMC	ON	45.0	36.6	732.0
P-2	Goulds 11CMC	OFF	45.0	36.6	
P-3	14TLC-2 (Pump-Flo)	OFF	126	36.6	
P-4	*14TLC-2 (Pump-Flo)*	*100% Backup*	*126*	*36.6*	
Total Flow Capacity		**ON**	**216**	**36.6**	

Table 3.1.7: Zone 2 Fire Pump Flow Capacities

Pump IDonew	Description	Status	Design Capacity (l/s)	Total Dynamic Head (m)	Hydraulic Grade Line (m)
FP-1	Cummins G-495	Standby	133.0	36.6	732.0
FP-2	Cummins G-495	Standby	74	65.5	

Zone 2 Operating Philosophy

The water distribution system within Zone 2 is only fed from the distribution system within Zone 1 and uses strategic system connections including four (4) Pressure Relief Valve (PRV) chambers installed across the city.

Zone 2 Reservoir is fed from Zone 1 via a the 600mm watermain and controlled to a flow rate of 77.0 L/s. The 600mm diameter watermain was originally operated as a dedicated gravity supply main between the South Pumphouse and Zone 2 reservoir. In 2008 this 600mm supply main was adapted into in the Zone 1 distribution system using several distribution system connections.

A fifth Pressure Reducing Valve (PRV) located inside the Zone 2 Pumphouse on the upstream end of the 600mm diameter main with a set pressure of 350 kPa (51 psi). Any excess pressure within Zone 1 will fill the Zone 2 Reservoir.

The Zone 1 Pumphouse will re-fill the Zone 2 reservoir during periods with low water demands. The estimated time required to fill the reservoir is summarized in **Table 3.1.8**.

Table 3.1.8: Zone 2 Reservoir Fill Time

Year	Exist. Volume (m3)	FCV, L/s	PDD Conditions (Zone 2)	
			Flow, L/s	Time to Fill, hours
2021	6,819	77	203.55	2.4
2025	6,819	77	203.55	2.6
2030	6,819	77	250.54	3.2
2040	6,819	77	309.01	4.0
2050	6,819	77	322.5	4.2

Zone 2 Potable Water Reservoir

The Zone 2 reservoir is a buried concrete reservoir located below the Zone 2 Pumphouse. The storage capacity is summarized in Table 4.8.

Table 3.1.9: Zone 2 Reservoir Capacity

Description	Volume (m3)
Single Cell	6,819
Zone 2 Total Available Storage	**6,819**

3.4 Pressure Reducing Valves (PRVs)

The local topography of the City of Spruce Grove generally slopes from south to north toward Highway 16. This gradual decrease in elevation is balanced by an increase in the head pressure of the water distribution system. Therefore, the further that the distribution system is extended to the north, the more the system pressure will increase.

The minimum system pressure shall be 350 kPa (50 psi) and a recommended maximum system pressure of 550 kPa (80 psi). Currently, two separate pressure zones are in place within the City's distribution system to help manage the end user's water pressures between 350 kPa and 550 kPa. The two pressure zones depend on five (5) Pressure Reducing Valve (PRV) chambers strategically placed in the distribution system.

All Pressure Reducing Valves (PRVs) were re-calibrated on September 11, 2019 based on a Hydraulic Grade Line (HGL) of 735.50m. This set point was determined based on the City's requirement to maintain an operating pressure range between 350 kPa (50 psi) and 550kPa (80 psi).

However, current pressure field measurements at Lakeland PRV confirmed the existing HGL is set to **732.0m**

The "Existing PRV's new Set-points and Calibration" letter is appended in **Appendix C** for reference.

Zone 1 is defined by the operating pressure of the Pressure Zone 2 and Pumphouse and controlled by the five (5) Pressure Reducing Valve (PRVs) chambers. The Pressure Reducing Valves (PRVs) defining Zone 1 and Zone 2 are located at the following locations:

- PRV-1 is located along Spruce Ridge Road west of Fuhr Sports Park and installed in 2010
- PRV-2 is located on King Street south of Woodhaven Drive and replaced with new chamber in 2014
- PRV-3 is located on Berkeley Street south of Bellville Ave and retrofitted in 2014
- PRV-4 is located on Lakeland Drive and replaced with new chamber in 2014

PRV-5 located inside of the Zone 2 Pumphouse and installed as part of the pumphouse upgrades completed in 2010. This Pressure Reducing Valve (PRV) manages the converted gravity supply main feeding Zone 2 Reservoir from Zone 1.

Note: the interconnecting supply main between Zone 1 and Zone 2 is connected to the distribution system in both zones.

As remaining developable lands are serviced within Zone 2, three (3) additional Pressure Reducing Valves will be required. One PRV will be required west of Jennifer Heil Way within the Spring Gate neighbourhood and two other PRVs will be required west of Pioneer Road.

3.5 Mobile City Estates

The Mobile City Estates subdivision is privately owner and operated, and located north of McLeod Avenue and west of Calahoo Road. The community lies within Zone 1 and is serviced through a sole water meter installed on a 150 mm diameter supply watermain. The system details of the area are illustrated on **Figure 3.4**. The internal water system servicing Mobile City Estates residents is directly connected to the City's distribution system at additional two locations. One connection to a 200mm diameter watermain on McLeod Avenue; the second connection to a 200mm watermain on Weston Drive. Both connection points are controlled by system valves that are normally closed for metering purposes.

The minimum required fire flow rate **cannot be achieved** within Mobile City Estates

HIGHWAY 16

PRESSURE ZONE 2

HARVEST RIDGE

GROVE DRIVE

SPRUCE RIDGE

COPPERHAVEN

TOWN OF STONY PLAIN

PRESSURE ZONE 1

HIGHWAY 16A

DEER PARK

ASHENGLEN

FIELDSTONE

LINKSIDE

SHORESHIRE

HILLDOWNS

GROVE SENIOR VILLAGE

HEATHERGLEN

MILLGROVE

HERITAGE CREEK

WOODHAVEN

CALAHOO ROAD

ENNIFER HELL WAY

LEGACY PARK

MCLAUGHLIN

WESTGROVE

MOBILE CITY ESTATES

CITY CENTRE

BROOKWOOD

BROXTON PARK

WESTGROVE COMMERCIAL

HIGHWAY 16A COMMERICAL

CANADIAN NATIONAL RAILWAY

MADISON INDUSTRIAL

DIAMOND INDUSTRIAL

DIAMOND AVENUE

SHEP INDUSTRIAL

CAMPSITE BUSINESS INDUSTRIAL

CAMPSITE ROAD

GOLDEN SPIKE ROAD

SPRUCE GROVE INDUSTRIAL

YELLOWHEAD INDUSTRIAL

SOUTH CENTURY

NAIT QUARTER

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

WESTWIND

KENTON

SPRUCE VILLAGE

GREENBURY

PRESCOTT

GROVE MEADOWS

TONEWOOD

PIONEER ROAD

KENWYCK

LAKEWOOD

CENTURY CROSSING

PRESSURE ZONE 2

PRESSURE ZONE 1

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

PARKLAND COUNTY

LEGEND

RESIDENTIAL	CITY LIMITS	EX 100mm WATERMAIN
COMMERCIAL	STUDY AREA	EX 150mm WATERMAIN
INDUSTRIAL	EX PRESSURE ZONE BOUNDARY	EX 200mm WATERMAIN
INSTITUTIONAL	EX NORTH/SOUTH PUMP HOUSE (N, S)	EX 250mm WATERMAIN
PARK / SWMF	EX PRESSURE REDUCING VALVE	EX 300mm WATERMAIN
GOLF COURSE	EX FLOW CONTROL VALVE	EX 350mm WATERMAIN
		EX 400mm WATERMAIN
		EX 450mm WATERMAIN
		EX 500mm WATERMAIN
		EX 600mm WATERMAIN
		EX 750mm WATERMAIN

SCALE 1:25 000

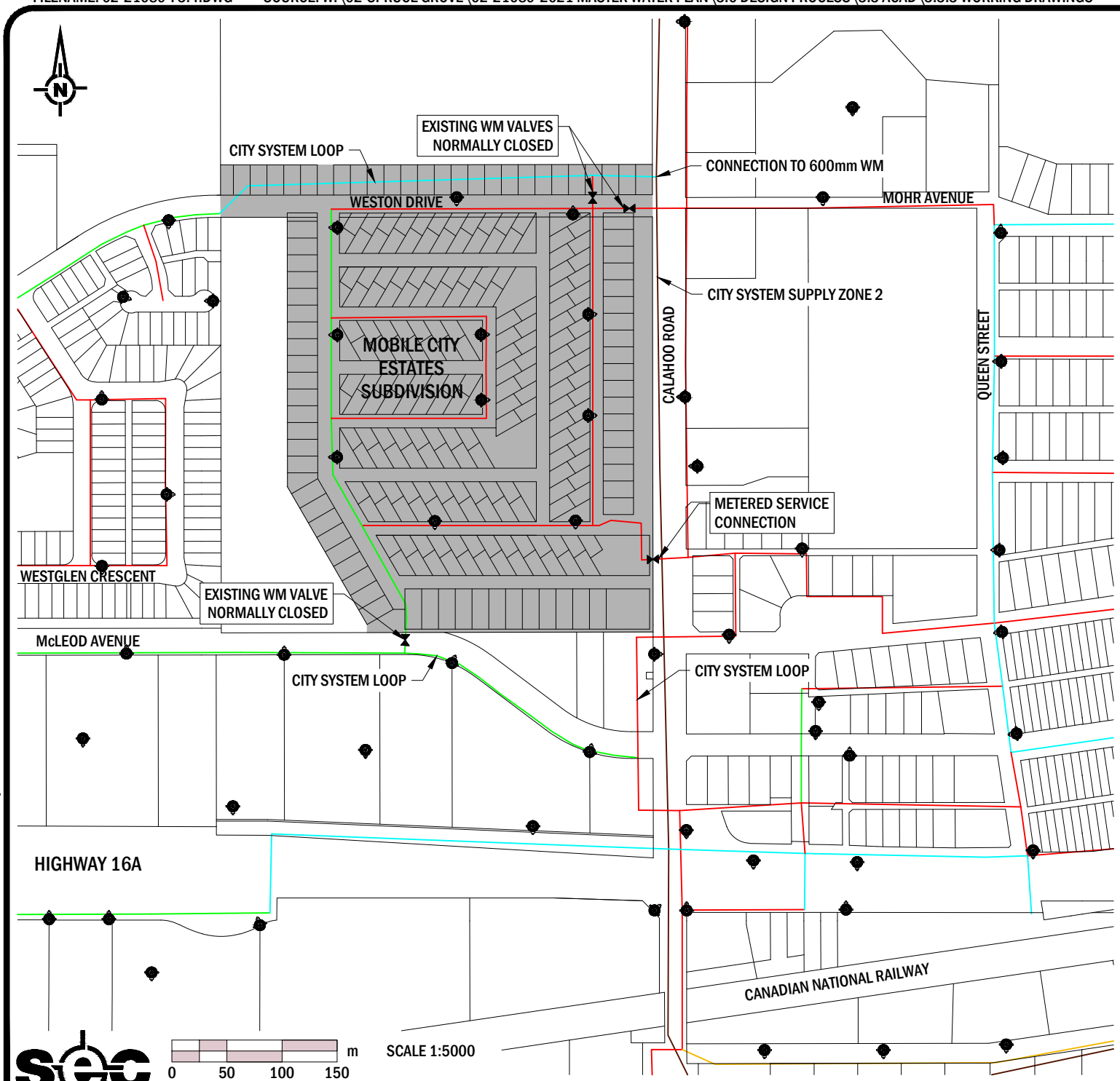
0 250 500 750 m

February 8, 2022 02-21089-F3.3.DWG

FIGURE 3.3
NEIGHBOURHOOD BOUNDARIES AND CURRENT WATER SYSTEM

The City of SPRUCE GROVE

FILENAME: 02-21089-F3.4.DWG SOURCE: W:\02-SPRUCE GROVE\02-21089-2021 MASTER WATER PLAN\3.0 DESIGN PROCESS\3.3 ACAD\3.3.3 WORKING DRAWINGS



LEGEND

- RESTRICTED FIRE FLOW
- EX HYDRANT
- EX 150mm WATERMAIN
- EX 200mm WATERMAIN
- EX 250mm WATERMAIN
- EX 300mm WATERMAIN
- EX 600mm WATERMAIN

FIGURE 3.4
WATER MASTER PLAN
MOBILE CITY ESTATES SERVICING

The City of SPRUCE GROVE

SAVED BY: JGALLARDO PLOT DATE: February 8, 2022

4.0 System Assessment

A municipal water system is comprised of water pipelines, pumphouses, storage facilities, pumps, and other accessories. Water pipelines include dedicated water supply mains and water distribution network. Storage facilities are reservoirs that maintain potable water volumes for daily consumption and emergency reserves with pump systems to move the water from the reservoirs to the distribution system to the end user.

This system assessment includes the use of modelling and analysis software that incorporates all aspects of the system including equipment, pumping philosophy, pipe sizes, pipe materials, pipe age, elevations, hydraulic grade lines, etc. The computerized model was calibrated with information from actual system results to verify the accuracy of the model and analysis results.

The City's water distribution system was assessed using WaterCAD, V8 dynamic modelling software. All the components of the water system required to perform a full system analysis were input into the model. Input components included storage reservoirs, pumps, distribution mains and pressure reducing valves, as shown on **Figure 4.1**. Water networking information was obtained from the following sources.

Table 4.1.1: System Information Sources

Description	Source
Water Consumption design criteria (ADD, MDD, PHD, FF)	2015 Municipal Development Standards
Pipe Diameter, Material, Install Date	City GIS database
Pump Models and Pumping Philosophy	Pumphouse O&M Manuals
Fire Hydrant locations	City GIS database
Water Usage Records	Public Works Dept.
Current and Future Land Uses and Study Area	City of Spruce Grove
Water Supply	2021 CRPWSC Water Master Plan
Parkland Village – Water Supply from City	City of Spruce Grove
10 Hydrant Flow Tests (2021)	N.S. Pawliuk

An effort to capture developments constructed in 2021 that were not yet incorporated into the City's GID database have been added into in the water model to represent the more adequately simulate the current system.

HIGHWAY 16

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 1

GROVE DRIVE

GROVE DRIVE

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

TOWN OF STONY PLAIN

PARKLAND COUNTY

PARKLAND COUNTY

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAILWAY

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TOWN OF STONY PLAIN

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

N

S

PRV-2

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F4.1.DWG

LEGEND

- CITY LIMITS
- STUDY AREA
- PRESSURE ZONE BOUNDARY
- JUNCTION w/ ID (J-1714)
- NORTH/SOUTH PUMP HOUSE (N, S)
- EX PRESSURE REDUCING VALVE
- FLOW CONTROL VALVE

- 100mm WATERMAIN
- 150mm WATERMAIN
- 200mm WATERMAIN
- 250mm WATERMAIN
- 300mm WATERMAIN
- 350mm WATERMAIN
- 400mm WATERMAIN
- 450mm WATERMAIN
- 500mm WATERMAIN
- 600mm WATERMAIN
- 750mm WATERMAIN

FIGURE 4.1
WATER MASTER PLAN MODEL SYSTEM & JUNCTION ID

The City of SPRUCE GROVE

4.1 Model Calibration

Calibrating a dynamic model helps to ensure adequate representation of the water distribution system. No field test records were available prior to initiating the preparation of this Water Master Plan.

Hydrant Flow Tests

Hydrant Flow Tests help to verify system pressure and available flow in the vicinity of each test location. An analysis of each test hydrant can also help to flag any anomalies in the system such as closed or restricted distribution system valves.

A field calibration was recommended and completed as part of the preparation of this Water Master Plan. On April 14, 2021, a hydrant flow test program was conducted by N.S. Pawliuk in the presence of the City of Spruce Grove and Select Engineering Consultants.

The flow test program included ten (10) fire hydrant locations throughout the city. Five hydrant flow tests (locations) were completed within each of the two (2) pressure zones. The location of each hydrant flow test is illustrated on Figure 5.2.

Field Test Procedure

The field procedure for the hydrant flow test as completed by Pawliuk is described below:

- one hydrant was used to perform each flow test
- a pressure gauge was installed on the hydrant nozzle
- the control valve was slowly opened to vent air in the hydrant body
- after air was expelled, the static pressure was recorded
- the hydrant was then fully opened and flow
- when the residual pressure stabilized, the residual pressure and the hydrant flow were recorded

The above procedure was repeated for all ten (10) field test locations. No incidents or unsuspected results were recorded at any hydrant flow test location. The field test results were

provided to Select Engineering and were used to determine the resultant available flow at each tested location.

A residual pressure of 140 kPa (20 psi) is the standard condition to determine the flow available in the water system. The measured flow rate from each of the field test locations was calculated using a residual pressure of 140 kPa to confirm the resultant available flow rate.

Hydrant Flow Test Results

The static pressure results from the field tests were compared with the system operating pressure set in the water model under the influence of normal operating conditions.

The static pressure was also compared with the Average Day Demand model results as the field tests were performed between 9:30 am and 2:00 pm. Based on the system working at normal operating pressure, the results are within 35 kPa (5 psi) difference at most locations. With respect to modelling calibration this difference is considered reasonable due to estimated ground elevations input into the model (default 3m bury) versus actual elevation of the buried mains.

The model calibration process provides certainty that the assessment reasonably represents the actual operation of the water system but does not provide absolute accuracy of the system in its entirety. **Table 4.1.2** provides a summary of the Hydrant Flow Test results with model comparisons. The hydrant flow test data and detailed calculated results are attached in **Appendix D**.

Table 4.1.2: Hydrant Flow Test Results

Test No.	Hydrant ID	Location	Field Pressure Static, kPa (psi)	Model Pressure Operating, kPa (psi)
1	H-00270	Diamond Ave	545 (79)	496 (72)
2	H-00320	South Ave	510 (74)	483 (70)
3	H-00521	Church Rd	510 (74)	483 (70)
4	H-00234	McLeod Ave	579 (84)	551 (80)
5	H-00183	Goebel Dr.	345 (50)	345 (50)
6	H-00836	Prescott Blvd.	537 (78)	517 (75)
7	H-01073	Vanderbilt Common	551 (80)	545 (79)
8	H-00227	Linksview Dr	579 (84)	551 (80)
9	H-00254	Millgrove Dr	483 (70)	469 (68)
10	H-00877	Harvest Ridge Dr	455 (66)	448 (65)

Continued hydrant flow testing is recommended as the distribution system is expanded and upsized for the following reasons:
- more data for calibrating the water model and refine/confirm accuracies throughout the City
- modelled scenarios continue to be executed to assess future extensions to the distribution system
- good practice to conduct flow tests at various locations within the water system to represent a broader calibration check

HIGHWAY 16

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 2

H-00227

H-01073

H-00836

H-00877

GROVE DRIVE

GROVE DRIVE

H-00254

PRV-5

N

FCV

PARKLAND COUNTY

TOWN OF STONY PLAIN

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

PRV-2

H-00183

PRV-4

PRV-1

PRV-3

PRESSURE ZONE 1

H-00521

H-00234

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAIL

H-00320

S

H-00270

DIAMOND AVENUE

PRESSURE ZONE 1

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TOWN OF STONY PLAIN

PARKLAND COUNTY

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F4.2.DWG

LEGEND

- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- EX HYDRANT NO. H-00234
- HYD FLOW TEST LOCATION
- EX NORTH/SOUTH PUMP HOUSE (N / S)
- EX PRESSURE REDUCING VALVE
- EX FLOW CONTROL VALVE
- EX 100mm WATERMAIN
- EX 150mm WATERMAIN
- EX 200mm WATERMAIN
- EX 250mm WATERMAIN
- EX 300mm WATERMAIN
- EX 350mm WATERMAIN
- EX 400mm WATERMAIN
- EX 450mm WATERMAIN
- EX 500mm WATERMAIN
- EX 600mm WATERMAIN
- EX 750mm WATERMAIN

FIGURE 4.2
WATER MASTER PLAN HYDRANT FLOW TEST LOCATION MAP

The City of SPRUCE GROVE

4.2 Water Supply

Currently, the Capital Region Parkland Water Services Commission (CRPWSC) provides and maintains a 300mm diameter and 600mm diameter supply main to provide the City of Spruce Grove with potable water. The Capital Region Parkland Water Services Commission (CRPWSC) estimates the Peak Day Demand (PDD) based on a peaking factor of 1.8x (PDD x 1.8).

Conversations with the City of Spruce Grove staff verified that there was no record of water shortages within the City due to the current water supply rate. The servicing contract between the City and the Capital Region Parkland Water Services Commission (CRPWSC) states that if the peak day demand increases higher than ADD x 1.8x, the shortage in the water supply will be supplemented by the capacity of the two water reservoirs.

The following table summarizes the water supplied by the Capital Region Parkland Water Services Commission (CRPWSC) to the City of Spruce Grove:

Table 4.2: Water Supply Assessment

Year	CRPWSC	City of Spruce Grove
	PDD, L/s	PDD, L/s
2020	213.61	292.97
2025	255.84	359.49
2030	298.61	395.86
2040	407.22	480.37
2045	475.55	530.83

IMPORTANT: **Table 4.2** shows that the peak day water demand projected by the Capital Region Parkland Water Services Commission (CRPWSC) does not meet the projected Peak Day Demand (PDD).

If the City of Spruce Grove experiences water shortages due to water supply limitations, it is recommended to review the contract with Capital Region Parkland Water Services Commission (CRPWSC) to re-assess the water supply rate.

4.3 Water Storage

As described in **Section 3.1**, the City of Spruce Grove is a member of the Capital Region Parkland Water Services Commission (CRPWSC) who are mandated to meet the City's water demand as indicated on **Table 3.12** the City's Zone 1 and Zone 2 combined reservoirs have adequate capacity to meet the design storage demand until the City reaches a maximum estimated population of 75,000 people, therefore no additional storage capacity is anticipated.

4.4 Pumps

The current water distribution system relies on several pumps to manage system demands including typical daily consumption, peak usage periods and emergency firefighting.

Table 4.4.1: Pump Summary

Pump ID	Zone	In Service Date (age years)	Model / Make	Purpose
P-001	1	2016 (5)	Fairbanks Morse	Distribution Pump
P-002	1	2016 (5)	Fairbanks Morse	Distribution Pump
P-003	1	2016 (5)	Fairbanks Morse	Distribution Pump
P-004	1	2016 (5)	Fairbanks Morse	Fire Pump
P-005	1	2016 (5)	Fairbanks Morse	Redundant Fire Pump
P-1	2	2018 (3)	Goulds 11CMC	Distribution Pump
P-2	2	2018 (3)	Goulds 11CMC	Distribution Pump
P-3	2	2009 (12)	14TLC-2 (Pump-Flo)	Distribution Pump
P-4	2	2009 (12)	14TLC-2 (Pump-Flo)	Distribution Pump
FP-1	2	2009 (12)	Cummins G-495	Fire Pump
FP-2	2	2009 (12)	Cummins G-495	Redundant Fire Pump

Distribution Pumps

The water distribution pumps need to meet Peak Hour Demand (PHD) for the entire City, as follows:

- Zone 1 – the distribution pumps within Zone 1 Pumphouse need the capacity to supply PHD for Zone 1 and fill the Zone 2 Reservoir during low demand
- Zone 2 – when water demand exceeds the Zone 1 Pumphouse's pumping capacity, the pumps within the Zone 2 Pumphouse will supply the additional demand to meet the total water demand in Zone 2. These pumps also need to have the capacity to include Parkland Village's water demand.

The pumping capacity of the City's water distribution system was assessed based on the total pump capacity at each pumphouse.

An assessment of the distribution pumps with respect to pumping capacity within Zone 1 is summarized in Table 5.5.

Table 4.4.2: Zone 1 Distribution Pump Assessments

Year	Design Pump Capacity (L/s)	Peak Hour Demand (L/s)	Assessment
2020	344	138.61	**OK**
2025	344	209.69	**OK**
2035	344	255.61	**OK**
2045	344	311.59	**OK**
+2045	344	312.50	**OK**

The above assessment assumes all three distribution pumps (P-001, P-002 and P-003) are ON. It is recommended that one pump should be reserved for 100% backup/redundancy.

The assessment concludes that the existing distribution pumps exceed the current water demands to service Zone 1 therefore no upgrades are required.

Furthermore, the pumping capacity to provide Peak Hour Demand (PHD) within Zone 1 and fill Zone 2 Reservoir is achieved per **Table 3.1.8** showing a fill time between 2.4 to 4.2 hours with a fill up rate of 77 L/s.

An assessment of the distribution pumps with respect to pumping capacity within Zone 2 is summarized in **Table 4.4.3**.

Table 4.4.3: Zone 2 Distribution Pump Assessments

Year	Design Pump Capacity (L/s)	Water Demand (L/s)			Assessment
		Peak Hour	Parkland Village	Total	
2020	216	207.91	10	217.91	OK
2025	216	314.54	10	324.54	refer to Table 4.4.4
2035	216	383.42	10	393.42	
2045	216	467.39	10	477.39	
+2045	216	468.75	10	478.75	

The total pumping capacity for the water distribution system is summarized in **Table 4.4.4**.

Table 4.4.4: Total Pumping Capacity Assessment

Year	Pumping Capacity, L/s			Required Water Demand, L/s			Assessment
	Zone 1	Zone 2	Total	Peak Hour (City)	Peak Day (Parkland Village)	Total	
2020	344	216	660	346.52	10	356.52	OK
2025	344	216	660	524.23	10	534.23	OK
2035	344	216	660	639.04	10	649.04	OK
2045	344	216	660	778.98	10	**788.98**	**Upgrade**
+2045	344	216	660	781.25	10	**791.25**	**Upgrade**

The above table shows that the distribution pumps can meet existing water demands until 2035. The pumps are recommended to be upgraded when the water demand exceeds 660 L/s, which is projected after 2035.

Fire Pumps

The Fire Flow (FF) for the City of Spruce Grove can be achieved from Zone 1 only. The assessment of the Zone 1 fire pumps are shown in the **Table 4.4.5**.

Table 4.4.5: Fire Pump Capacity Assessment

Description	Design Pump Capacity (l/s)	Fire Flow Req'd (l/s)	Assessment
P-004	300	300	**OK**
P-005 (100% Backup)	300		

The above table shows that the existing fire pump P-004 in Zone 1 has the capacity to meet the fire flow requirements based on 300 L/s.

4.5 Water Distribution System

The current water distribution system was assessed for the following water demand scenarios:

- Average Day Demand (ADD)
- Maximum Day Demand (MDD)
- Peak Hour Demand (PHD)
- Maximum Day Demand plus Fire Flows (MDD+FF)

Average Day Demand (ADD)

The minimum and maximum simulated pressure for the current ADD demand is summarized in the following table:

Table 4.5.1: Current System Average Day Demand (ADD)

Zone (HGL, m)	Minimum Simulated Pressure			Maximum Simulated Pressure		
	kPa	psi	Location	kPa	Psi	Location
Zone 1 (756.40)	399	58	J-1-32	671	97	J-1-290
Zone 2 (732.00)	305	44	J-64	607	88	J-2-409

The model results show that the pressure for the current ADD doesn't met the newly recommended pressure limits between 350 kPa (50 psi) and 550 kPa (80 psi). To facilitate the pressure ranges throughout the city, recommended system strategies have been developed in **Section 6.0**.

The velocities through the watermain are lower than the maximum recommended 1.5 m/s within both zones and meet the 2015 Municipal Development Standards.

Figure 4.3 illustrates the average day pressure contours based on the existing ADD. Detailed model results for the ADD condition are included in **Appendix E**.

Maximum Day Demand (MDD)

The minimum and maximum simulated pressure for each of the current MDD is summarized in the following table:

Table 4.5.2: Current System Maximum Day Demand (MDD)

Zone (HGL, m)	Minimum Simulated Pressure			Maximum Simulated Pressure		
	kPa	psi	Location	kPa	psi	Location
Zone 1 (756.40)	396	57	J-1-32	665	96	J-1-290
Zone 2 (732.00)	303	44	J-64	604	88	J-2-409

The model results show that the pressure for the current Maximum Day Demand (MDD) **does not** meet the recommended pressure limits between 350 kPa (50 psi) and 550 kPa (80 psi). The recommended water system improvements are described under **Section 5.0**.

The velocities through the watermain are lower than the maximum recommended 1.5 m/s within both zones, therefore current municipal development standards are being maintained.

Figure 4.4 illustrates the Maximum Day Demand (MDD) pressure contours. Detailed model results for the MDD condition are included in **Appendix F**.

Peak Hour Demand (PHD)

The minimum and maximum simulated pressure for each of the water system conditions under PHD is summarized in the following table:

Table 4.5.3: Current System Peak Hour Demand (PHD)

Zone (HGL, m)	Minimum Simulated Pressure			Maximum Simulated Pressure		
	kPa	psi	Location	kPa	psi	Location
Zone 1 (756.46)	394	57	J-1-32	659	95	J-1-290
Zone 2 (732.00)	301	43	J-2-64	599	87	J-2-409

The model results show that the pressure for the current PHD doesn't met the recommended pressure limits between 350 kPa (50 psi) and 550 kPa (80 psi). The recommended water system improvements are described under Section 6.0.

The velocities through the watermain are lower than the maximum recommended 1.5 m/s within both zones, therefore meet current municipal development standards.

Figure 4.5 indicates the Peak Hour Demand (PHD) pressure contours, and detailed simulation results are included in **Appendix G**.

Maximum Day Demand and Fire Flow Demand (MDD + FF)

Model results shows that the existing water system **does not** have the capacity to provide fire flows throughout the entire system, mainly due to the undersized watermains. The majority of the fire flow deficiencies are in the downtown area located in Zone 1.

Figure 4.6 identifies the currently available Fire Flow. The detailed simulation results of the current system's Maximum Day Demand + Fire Flow (MDD+FF) are included in **Appendix H.**

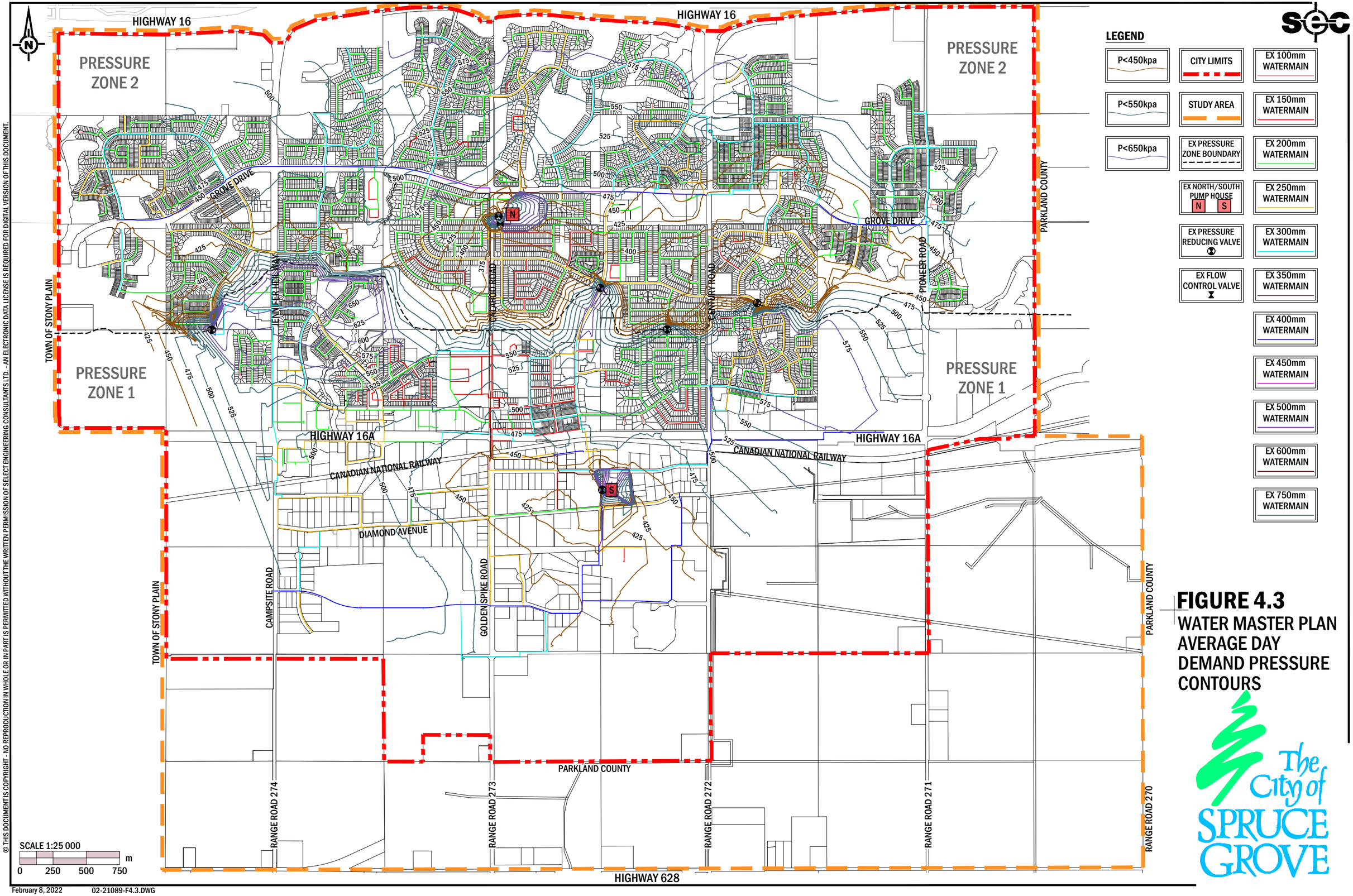


FIGURE 4.3
WATER MASTER PLAN AVERAGE DAY DEMAND PRESSURE CONTOURS

The City of SPRUCE GROVE

February 8, 2022 02-21089-F4.3.DWG

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 1

TOWN OF STONY PLAIN

PARKLAND COUNTY

GROVE DRIVE

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

N

S

LEGEND

- P<450kpa
- P<550kpa
- P<650kpa
- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- EX NORTH/SOUTH PUMP HOUSE (N S)
- EX PRESSURE REDUCING VALVE
- EX FLOW CONTROL VALVE
- EX 100mm WATERMAIN
- EX 150mm WATERMAIN
- EX 200mm WATERMAIN
- EX 250mm WATERMAIN
- EX 300mm WATERMAIN
- EX 350mm WATERMAIN
- EX 400mm WATERMAIN
- EX 450mm WATERMAIN
- EX 500mm WATERMAIN
- EX 600mm WATERMAIN
- EX 750mm WATERMAIN

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F4.4.DWG

FIGURE 4.4
WATER MASTER PLAN MAXIMUM DAY DEMAND PRESSURE CONTOURS

The City of SPRUCE GROVE

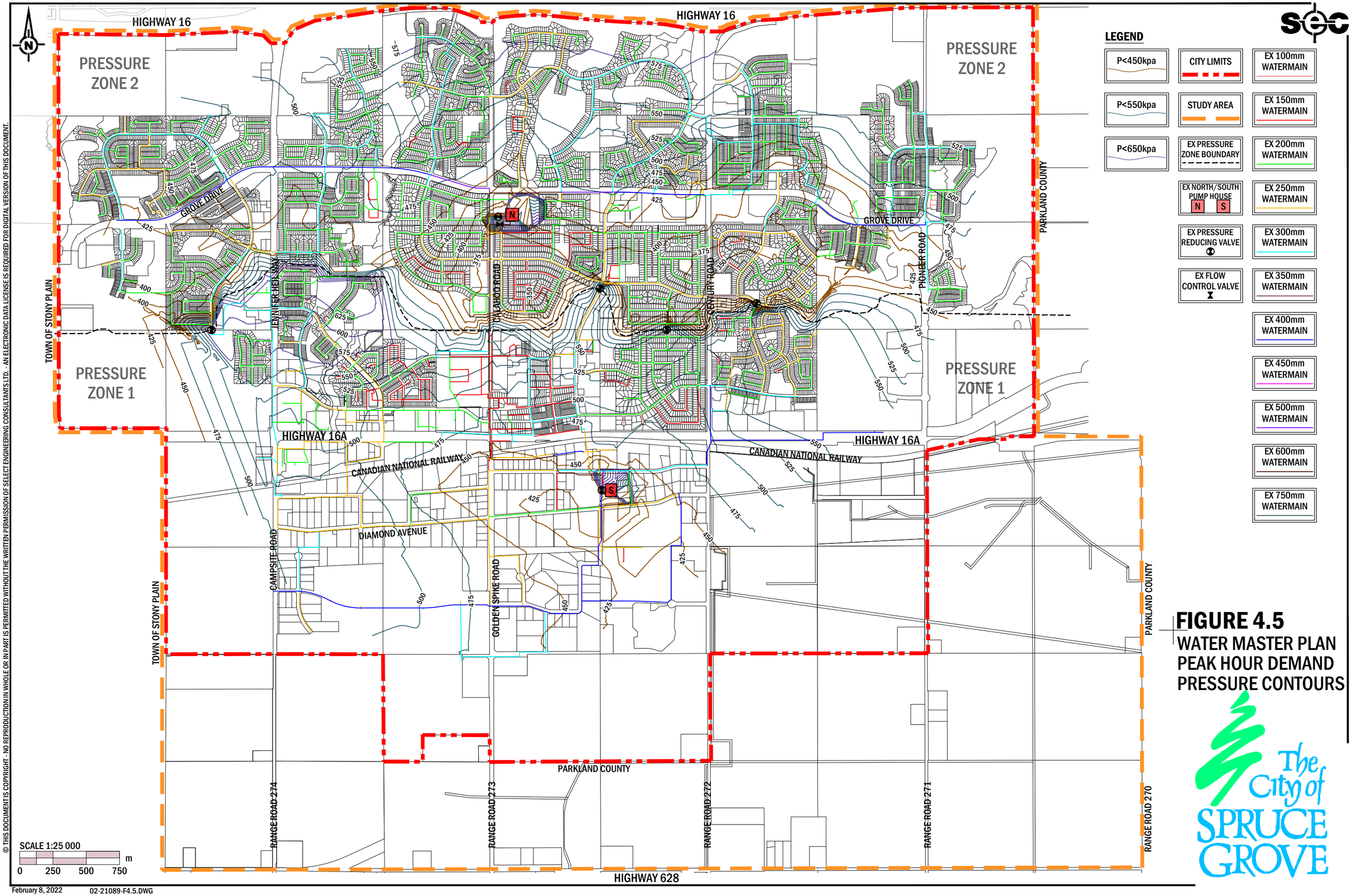


FIGURE 4.5
WATER MASTER PLAN PEAK HOUR DEMAND PRESSURE CONTOURS

The City of SPRUCE GROVE

February 8, 2022 02-21089-F4.5.DWG

HIGHWAY 16

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 1

TOWN OF STONY PLAIN

PARKLAND COUNTY

GROVE DRIVE

GROVE DRIVE

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

PRV-1

PRV-2

PRV-3

PRV-4

PRV-5

FCV

N

S

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAILWAY

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

PARKLAND COUNTY

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F4.6.DWG

LEGEND

- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- SATISFIES FIRE FLOW
- DOES NOT SATISFY FIRE FLOW
- EX NORTH/SOUTH PUMP HOUSE (N / S)
- EX PRESSURE REDUCING VALVE
- EX FLOW CONTROL VALVE
- EX 100mm WATERMAIN
- EX 150mm WATERMAIN
- EX 200mm WATERMAIN
- EX 250mm WATERMAIN
- EX 300mm WATERMAIN
- EX 350mm WATERMAIN
- EX 400mm WATERMAIN
- EX 450mm WATERMAIN
- EX 500mm WATERMAIN
- EX 600mm WATERMAIN
- EX 750mm WATERMAIN

FIGURE 4.6

WATER MASTER PLAN MAXIMUM DAY DEMAND PLUS FIRE FLOW

The City of SPRUCE GROVE

5.0 Recommended System Improvements

5.1 Water Distribution System Upgrades

Upgrading of the two existing Pump Houses and calibrating all the PRV's, the existing water system is confirmed to achieve adequate pressure within each of the four zones. However, to satisfy the maximum day plus fire flow demand as per City's standards, the existing distribution system requires upgrades to a large number of watermains.

The system assessment shows that the MDD + FF does not meet the design criteria for fire flows at the minimum required pressure of 140 kPa and a maximum 3.0 m/s velocity.

The following system improvements are required to be able to achieve adequate Maximum Day Demand + Fire Flow Demand and are summarized based on the recommended priority improvements, downtown district and for each pressure zone recommended improvements.

Figure 5.3 identifies the proposed overall upgrades within the City water system to meet the required fire flow condition.

The system assessment shows that the operating pressure under ADD, MDD, PHD **do not** meet the design requirements and the improvements described below are required to satisfy minimum 350 kPa to maximum 550 kPa.

To satisfy the above pressure range, two (2) additional pressure zones, Zone 3 and Zone 4, would be required to modify the current pressure variances within Zone 2.

Proposed Pressure Zone 3

This pressure zone is created to increase end user operating pressures to within the Grove Meadows neighbourhood. The following strategy has been developed with City administration to create Pressure Zone 3.

- close existing gate valve located on the existing 200 mm diameter waterline located along the lane northwest of the area,
- close existing gate valve located on the existing 200 mm diameter at the northeast end of Grassview Crescent,
- reset the existing PRV-4 to a proposed 440 kPa (64 psi) downstream pressure, equivalent to an HGL = 743.0 m
- add an additional PRV 4A installed on Brookwood Drive, south west of this neighbourhood on the existing 250mm diameter watermain. This PRV will provide the second water feed into this neighbourhood, adding redundancy to the water system. It is important to mention that the second water feed should be from pressure Zone 1 to the new pressure Zone 3 and the location can be determined based on the best construction conditions. HGL = 743.0 m.
- install an additional PRV 4B on the existing 250 mm diameter watermain on Greystone Drive, north of Greenwood Drive to maintain the water system looping into Pressure Zone 2. HGL = 743.0 m.
- the proposed HGL setting point of all three PRV's within the Pressure Zone 3 is 743.0m.

Figure 5.1 illustrates the above proposed improvements.

Table 5.1.1: PRV-4 Recommended Settings and Pressure Summary

PRV Location	Elev	Upstream		Downstream		Min Pressure	Max Pressure
	m	kPa (psi)	HGL, m	kPa (psi)	HGL, m	kPa (psi)	kPa (psi)
Lakeland Drive	697.07	565 (82)	755.44	441 (64)	743.00	414 (60)	74

Proposed Pressure Zone 4

Due to the existing low ground elevation to the north side of the City, the neighbourhoods within this area are currently experiencing higher pressures above 550 kPa (80 psi). To mitigate the higher pressure in these areas, five (5) PRVs are proposed to create a new pressure Zone 4 with a recommended hydraulic grade line (HGL) of 720.00m. This hydraulic grade line (HGL) will maintain a pressure range between 350 kPa and 550 kPa for the existing and remaining developable lands in the area. **Figure 5.2** illustrates the proposed improvements to create pressure Zone 4.

The following table is a summary of the Zone 4 PRV's proposed new setting:

Table 5.1.2: Zone 4 PRV's Proposed Settings and Pressure Zone Summary

Proposed Zone 4 PRV's			Zone 4 Neighbourhood	
PRV's Number	Existing Elevation m	Proposed PRV's Setting HGL, m	Min Pressure kPa (psi)	Max Pressure kPa (psi)
6	676.5	720.0	394 (57 psi)	502 (73 psi)
7	677.45	720.0		
8	677.50	720.0		
9	676.38	720.0		
10	673.80	720.0		

The creation of pressure Zone 4 will restrict the three (3) existing neighbourhoods to a single water feed. These neighbourhoods are Aspenglen, Fieldstone and Stoneshire.

To add redundancy to these neighbourhoods, a watermain is proposed to be installed to the north, looping the watermains within all three neighbourhoods per **Figure 5.2**. The alignment of this required watermain loop will be determined by the City.

The following table summarizes the hydraulic grade line (HGL) required at each Pressure Zone set point within the system.

Table 5.1.3: Hydraulic Grade Line (HGL) for Pressure Zones

Pressure Zone	Hydraulic Grade Line HGL
1	756.4m
2	732.0m
3	745.0m
4	720.0m

Priority System Improvements

Table 5.2.1: Priority System Improvements

ID	Location	Improvement
P-1	**Diamond Avenue to Zone 1 Pumphouse**	Increased water supply from Zone 1 Pumphouse to the water distribution system
	1. Install a new 300mm diameter watermain from the existing 250mm diameter watermain located in the intersection of Schram Avenue / Diamond Avenue to the Zone 1 Pumphouse 2. Install a 300mm diameter watermain to cross-connect the existing 450mm feed from Zone 1 Pumphouse to the new 300mm diameter watermain in Step 1 within the intersection	
P-2	**Diamond Avenue between Golden Spike Road and Century Road**	Increased water supply to promote required Fire Flow availability and system redundancy
	1. Remove and replace the existing 200mm and 250mm diameter watermains with new 400mm diameter watermain from the intersection of Golden Spike Road to approx. 1,430m east along Diamond Avenue 2. Connect existing mains and service leads to new 400mm diameter main	
P-3	**east of Saskatchewan Drive and north of Public Works Yard**	System distribution system loop to increased water quality and system redundancy
	1. Install a new 250mm diameter watermain from the exiting 250mm diameter watermain stub located along the north side of the Public Works Yard 2. Extend new 250mm watermain to connect to existing 400mm diameter watermain approx. 220m to the east	

Downtown District Improvements

Table 5.2.2: Downtown District Improvements

ID	Location	System Improvement
D-1	**Golden Spike Road between South Avenue and First Avenue**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Install a new 300mm diameter watermain to replace existing 150mm diameter watermain – approximately 250m 2. Abandon existing 150mm diameter watermain in place	
D-2	**south side of Highway 16A from Golden Spike Road to approx. 380m to the east**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 300mm diameter watermain – approximately 200m	
D-3	**First Avenue between Queen Street and King Street**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 300mm diameter watermain – approximately 380m 2. Connect existing mains and services leads to new 300mm watermain	
D-4	**Lane from Lane south of McLeod Avenue to Lane north of McLeod Avenue**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 250mm diameter watermain – approximately 310m	
D-5	**Lane north of McLeod Avenue from Queen Street to approx. 200m west**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 250mm diameter watermain – approximately 200m 2. Connect existing mains and services leads to new 250mm watermain	
D-6	**Mohr Avenue from Queen Street to Calahoo Road**	System distribution system loop upsized to increased water quality and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 300mm diameter watermain – approximately 550m 2. Connect existing mains and services leads to new 300mm watermain	

ID	Location	System Improvement
D-7	**Main Street from First Avenue to Mohr Avenue**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 250mm diameter watermain – approximately 580m 2. Connect existing mains and service leads to new 250mm watermain	
D-8	**Church Road from Queen Street to Calahoo Road via Lane north of Andrews Crescent**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 300mm diameter watermain – approximately 300m 2. Connect existing mains and service leads to new 300mm watermain	
D-9	**Church Road from King Street to Queen Street**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 250mm diameter watermain – approximately 350m 2. Connect existing mains and service leads to new 250mm watermain	
D-10	**Calahoo Road from First Avenue to Mohr Avenue**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 300mm diameter watermain – approximately 650m 2. Connect existing mains and service leads to new 300mm watermain	
D-11	**Jespersen Avenue from Queen Street to Main Street**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 300mm diameter watermain – approximately 350m 2. Connect existing mains and service leads to new 300mm watermain	
D-12	**McPherson Avenue from Queen Street to Main Street**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 250mm diameter watermain – approximately 350m 2. Connect existing mains and service leads to new 250mm watermain	

ID	Location	System Improvement
D-13	**Agrena Road From King Street to north of Agrena**	Increased water supply to the Spruce Grove Lions Log Cabin and promote required Fire Flow availability of 232 L/s
	1. Remove and replace the existing 150mm diameter watermain with a new 250mm diameter – approximately 320m 2. This watermain services the existing Spruce Grove Lions Log Cabin and will provide a required Fire Flow for this site is 232 L/s 3. The new 250mm diameter single feed watermain will have the capacity to meet this requirement based on a minimum 140 kPa residual pressure. However, the velocity through this pipe is 4.75 m/s, higher than the maximum recommended 3.0 m/s 4. Considering that this is a temporary condition hydraulic condition during an emergency situation, the higher velocities through this pipe not expected to be a risk for system failure	
D-14	**King Street from First Avenue to McLeod Avenue**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy; and removal of AC pipe from system
	1. Remove and replace existing 250mm diameter watermain with new 300mm diameter watermain – approximately 120m 2. Connect existing mains and service leads to new 300mm watermain 3. This upgrade is recommended to remove the existing asbestos cement pipe	
D-15	**King Street from PVR-2 to south approx. 435m**	Increased water supply to the Downtown District and promote required Fire Flow availability and system redundancy
	1. Remove and replace existing 250mm diameter watermain with new 300mm diameter watermain – approximately 450m 2. This upgrade is recommended to remove the existing asbestos cement pipe	
D-16	**Additional Fire Hydrants**	Provide minimum hydrant coverage per 2015 Municipal Development Standards to accommodate higher density development
	1. Install eight (8) fire hydrants within the Downtown area 2. See **Figure 3.1** for hydrant locations	

Figure 5.3 identifies the Downtown District system upgrades

Zone 1 System Improvements

Table 5.2.3: Zone 1 Improvements

ID	Location	System Improvement
Z1-1	**McLeod Avenue between Calahoo Road and Lamplight Drive**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 300mm diameter watermain – approximately 1,750m 2. Connect existing mains and service leads to new 300mm watermain	
Z1-2	**Highway 16A from Westgrove Drive to approx. 450m west**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 300mm diameter watermain – approximately 450m	
Z1-3	**Alberta Avenue from Diamond Avenue to mid-block of Alberta Avenue**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 250mm diameter watermain – approximately 400m 2. Connect existing mains and service leads to new 250mm watermain	
Z1-4	**Shep Street from Diamond Avenue to South Avenue**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 150mm diameter watermain with new 250mm diameter watermain – approximately 325m 2. Connect existing mains and service leads to new 250mm watermain	
Z1-5	**Yellowhead Road between Diamond Avenue and South Avenue**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with new 250mm diameter watermain – approximately 260m 2. Connect existing mains and service leads to new 250mm watermain	
Z1-6	**South Avenue between Golden Spike Road and Shep Street**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 250mm diameter watermain with new 300mm diameter watermain – approximately 520m 2. Connect existing mains and service leads to new 300mm watermain	

ID	Location	System Improvement
Z1-7	**Tamarack Drive between Golden Spike Road and Shep Street**	Increase Fire Flow availability and system redundancy
	1. Install new 300 mm diameter watermain completing the watermain loop between the existing 250mm watermains at each end – approximately 1,000m	
Z1-8	**Commercial Centre north of Highway 16A and Jennifer Heil Way**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with a new 250mm diameter watermain – approximately 350m	
Z1-9	**Commercial Centre south of Highway 16A and Campsite Road**	Increase Fire Flow availability and system redundancy
	1. Remove and replace existing 200mm diameter watermain with a new 250mm diameter watermain – approximately 380m	
Z1-10	**46 New Fire Hydrants**	Increase fire hydrant coverage to comply with 2015 Municipal Development Standards
	See **Figure 3.1** for hydrant locations throughout the city	

Zone 2 System Improvements

Table 5.2.4: Zone 2 Improvements

ID	Location	System Improvement
Z2-1	**Copperhaven Drive from south side of Grove Drive to north side of Grove Drive**	Increase Fire Flow availability and system looping and redundancy
	1. Install a new 300mm watermain to connect the existing 300mm watermain along Copperhaven Drive to the existing 400mm diameter watermain on Grove Drive – approximately 70m	
Z2-2	**Greystone Drive from Greystone Crescent to Victoria Avenue**	Increase Fire Flow availability and system looping and redundancy
	1. Remove and replace existing 250mm diameter watermain with new 300mm diameter watermain – approximately 275m 2. Connect existing mains and service leads to new 300mm watermain	
Z2-3	**2 New Fire Hydrants**	Increase fire hydrant coverage to comply with 2015 Municipal Development Standards
	See **Figure 3.1** for hydrant locations throughout the city	
Z2-4	**8,900 meters**	Upsize mains to meet minimum 2015 Municipal Development Standards (Non-Priority upgrades)
	1. Replace existing 150mm diameter watermains with new 200mm diameter watermains	

Figure 5.4 identifies the system improvements within Zone 1 and 2

Zone 3 System Improvements

The designated Zone 3 footprint is to be removed from Zone 2 and be serviced as its own pressure zone controlled by the existing Lakeland PRV and two (2) additional PRV's proposed to be located on Grove Meadow Drive, east of Century Road and on Greystone Drive, north of Greenwood Drive.

Table 5.2.5: Zone 3 System Improvements

ID	Location	System Improvement
Z3-1	**Lakeland Drive at Grove Meadows Drive**	Create independent HGL for Pressure Zone 3 from Pressure Zone 1
	1. Set the Hydraulic Grade Line (HGL) of existing PRV-4 to 743.0m	
Z3-2	**Brookwood Drive at Century Road**	Connection from Zone 2 to create independent HGL for Pressure Zone 3
	1. Install new PRV-4A on the existing 250mm diameter watermain 2. Set hydraulic grade line (HGL) set to 743.0m	
Z3-3	**Greystone Drive south of Greystone Crescent**	Connection from Zone 2 to create independent HGL for Pressure Zone 3
	1. Install new PRV-4B with the extension of the proposed 300mm diameter watermain upgrades along Greystone Drive 2. Set hydraulic grade line (HGL) set to 743.0m	

Figure 5.3 identifies the system improvements required to create Pressure Zone 3

Zone 4 System Improvements

Table 5.2.6: Zone 4 System Improvements

ID	Location	System Improvement
Z4-1	**Aspenglen Drive south of Ashgrove Drive**	Connection from Zone 2 to create independent HGL for Pressure Zone 4
	1. Install new PRV-6 on the existing 300mm diameter watermain 2. Set hydraulic grade line (HGL) set to 720.0m	
Z4-2	**Linkside Court south of Longview Drive**	**New PRV-7** Connection from Zone 2 to create independent HGL for Pressure Zone 4
	1. Install new PRV-7 on the existing 250mm diameter watermain 2. Set hydraulic grade line (HGL) set to 720.0m	
Z4-3	**Fairway Drive south of Fairway Point**	**New PRV-8** Connection from Zone 2 to create independent HGL for Pressure Zone 4
	1. Install new PRV-8 on the existing 300mm diameter watermain 2. Set hydraulic grade line (HGL) set to 720.0m	
Z4-4	**Longview Drive north of Kings Link**	**New PRV-9** Connection from Zone 2 to create independent HGL for Pressure Zone 4
	1. Install new PRV-9 on the existing 300mm diameter watermain 2. Set hydraulic grade line (HGL) set to 720.0m	
Z4-5	**Kenton Way between Kenton Woods Lane and Kingsbury Circle**	**New PRV-10** Connection from Zone 2 to create independent HGL for Pressure Zone 4
	1. Install new PRV-10 on the existing 300mm diameter watermain 2. Set hydraulic grade line (HGL) set to 720.0m	
Z4-6	**Longview Drive between Avonlea Court and Fairway Drive**	Distribution system looping and redundancy for those areas within Aspenglen, Fieldstone, and Stoneshire neighbourhoods remaining within the original Zone 2
	1. Install new 250mm diameter watermain to connect the existing 250mm diameter watermain at Avonlea Court directly to the existing 300mm diameter watermain at Fairway Drive – approximately 1,000m	

Figure 5.2 identifies the system improvements required to create Pressure Zone 4

5.2 Phased Distribution System Expansion

The City's forecasted water system was assessed for the following key milestones:

i. Water System in 5 Years (2025) serving 50,326 people

ii. Water System in 15 Years (2035) servicing 61,348 people

iii. Ultimate Water System at +25 Years (+2045) servicing 75,000 people

NOTE: Proposed Ultimate Water System and Annexation (max 75,000 people)

The system analysis for the ultimate condition assumes that all the recommended upgrades within this Water Master Plan are completed.

Figure 5.5 illustrates the proposed water system phasing expansion.

2025 Water Distribution System

Based on the City Land Development Plan, 2025 developments will occur to the south, east and west of the City. To meet the Maximum Day plus Fire Flow Demand for 2025, the water distribution system is recommended to be extended as shown in **Figure 5.6**.

Model results for the forecasted 2025 MDD + FF for this interim condition are attached in **Appendix I**.

2035 Water Distribution System

Figure 5.7 identifies the 2035 water distribution system required to meet adequate MDD + FF within the current City limits. Model results for the 2035 Ultimate system condition are attached in **Appendix J**.

+2045 Ultimate Water Distribution System (including future annexation lands)

The City of Spruce Grove is expected to expand its current municipal boundary and servicing areas as the City's growth is expected to continue at a steady rate. Annexation is expected to focus on lands to the south and south-east as the City is constrained to the west (Town of Stony Plain) and to the north (Highway 16). To service the ultimate servicing area, the conceptual water distribution network is proposed to be expanded as illustrated in **Figure 5.8.**

The water model results show that if all recommended system improvements are completed, the water system will have the capacity to meet MDD + FF at the ultimate system build-out. Results for this modelled scenario are attached in **Appendix K**.

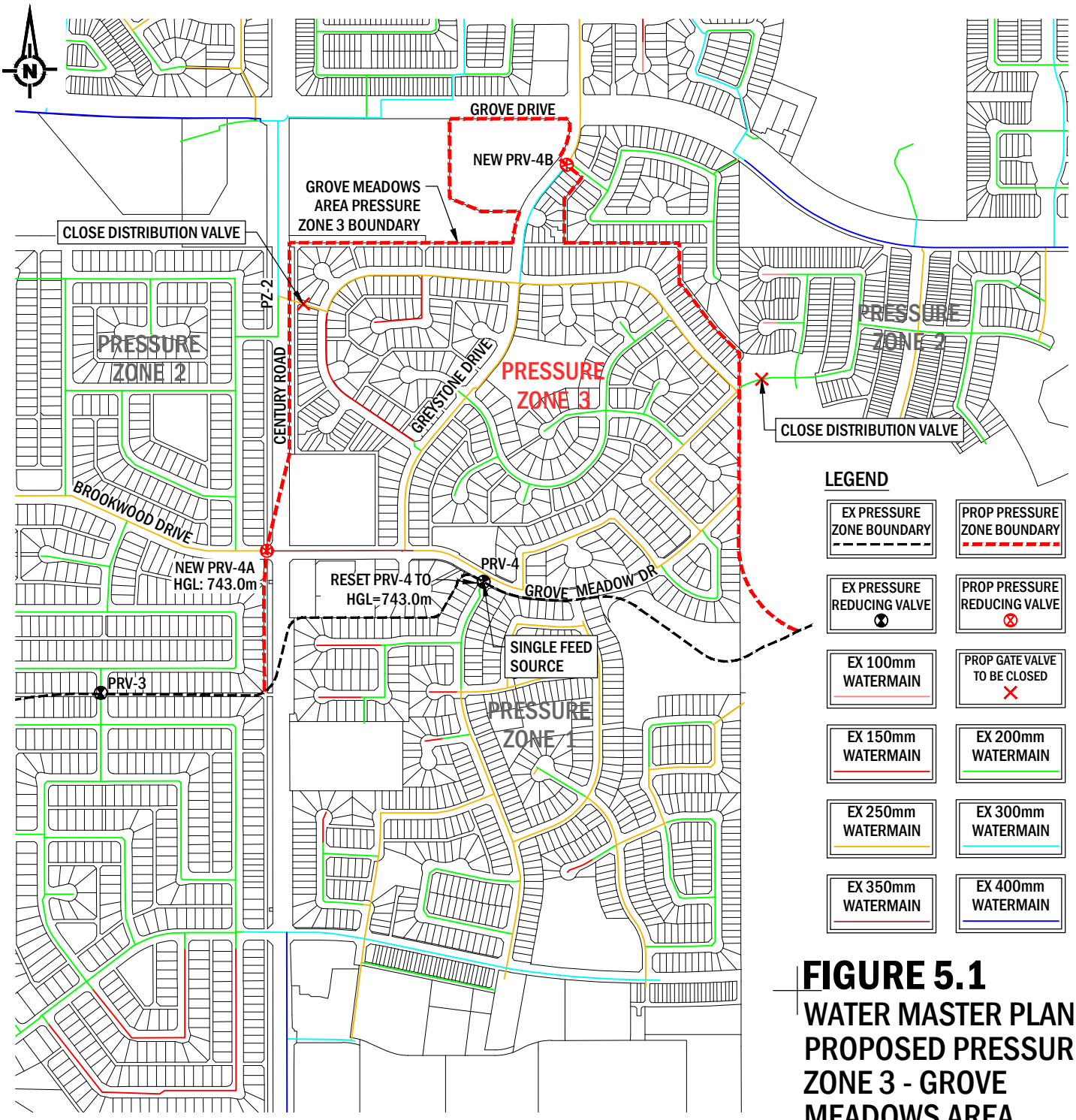


FIGURE 5.1
WATER MASTER PLAN PROPOSED PRESSURE ZONE 3 - GROVE MEADOWS AREA

PRV-4 PROPOSED PRESSURE SETTING SUMMARY

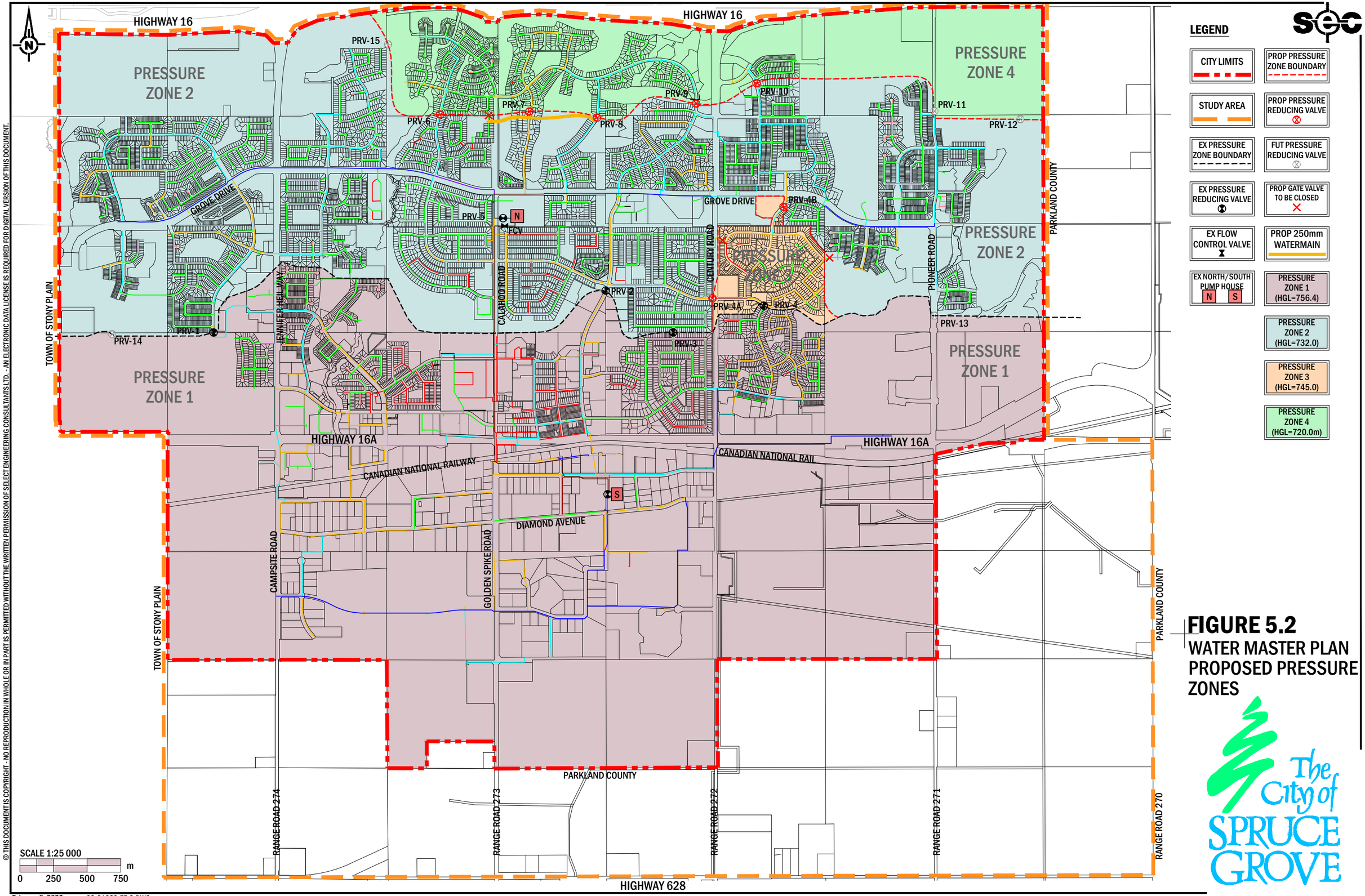
EX GROUND	UPSTREAM PRESSURE		DOWNSTREAM PRESSURE	
m	HGL, m	psi (kPa)	HGL, m	psi (kPa)
697.80	756.4	82 (565)	743.0	64 (441)

GROVE MEADOWS AREA ADJUSTED PRESSURE SUMMARY (HGL=743 m)

EX GROUND ELEVATION, m	EQUIVALENT PRESSURE, psi (kPa)
MIN = 690.90	74 (510)
MAX = 700.87	60 (414)

0 100 200 300 m SCALE 1:10 000

The City of SPRUCE GROVE



February 8, 2022 02-21089-F5.2.DWG

FIGURE 5.2
WATER MASTER PLAN PROPOSED PRESSURE ZONES

The City of SPRUCE GROVE

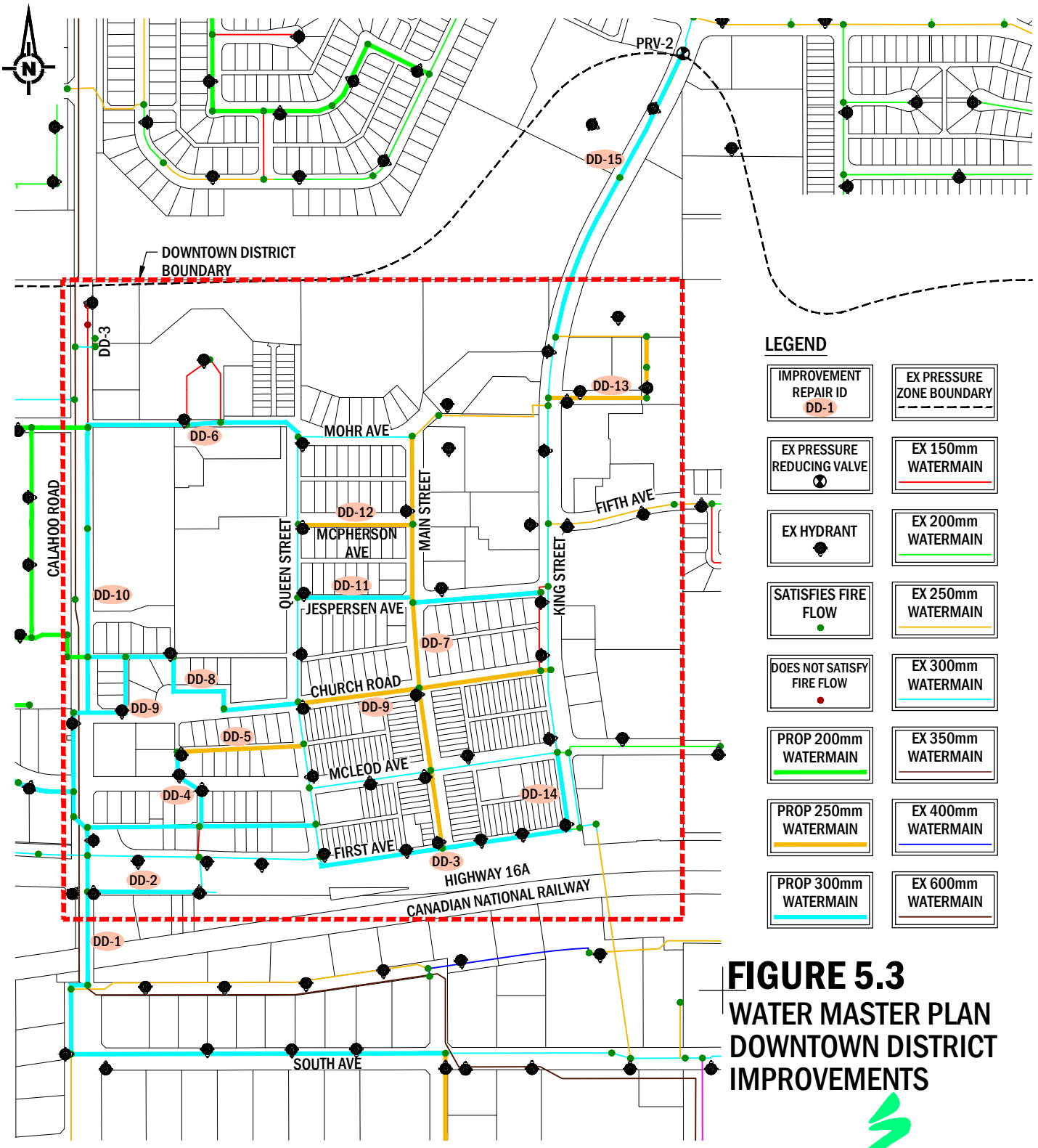


FIGURE 5.3
WATER MASTER PLAN DOWNTOWN DISTRICT IMPROVEMENTS

IMPROVEMENT REPAIR ID'S

• DD-1	• DD-6	• DD-11
• DD-2	• DD-7	• DD-12
• DD-3	• DD-8	• DD-13
• DD-4	• DD-9	• DD-14
• DD-5	• DD10	• DD-15

0 75 150 225 m SCALE 1:7500

The City of SPRUCE GROVE

FILENAME: 02-21089-F5.3.DWG SOURCE: W:\02-SPRUCE GROVE\02-21089-2021 MASTER WATER PLAN\3.0 DESIGN PROCESS\3.3 ACAD\3.3.3 WORKING DRAWINGS

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 4

PRV-1 PRV-2 PRV-3 PRV-4 PRV-5 PRV-6 PRV-7 PRV-8 PRV-9 PRV-10

FCV

GROVE DRIVE

COPPERHAVEN DR

JENNIFER HEIL WAY

CALAHOOD ROAD

KING STREET

CENTURY ROAD

GREYSTONE DRIVE

PIONEER ROAD

PARKLAND COUNTY

TOWN OF STONY PLAIN

SEE NOTE 1

REFER TO FIGURE 5.1

WESTGROVE COMM.

MCLEOD AVE

WESTGROVE

HIGHWAY 16A

HWY 16A COMM.

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAIL

SEE NOTE 2

REFER TO FIGURE 5.4

SOUTH AVENUE

ALBERTA AVENUE

DIAMOND AVENUE

SEE DETAIL "A"

SHEP ST

SHRAM ST

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TAMARACK DRIVE

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

HIGHWAY 628

Z1-1 Z1-2 Z1-3 Z1-4 Z1-5 Z1-6 Z1-7 Z1-8 Z1-9 Z2-1

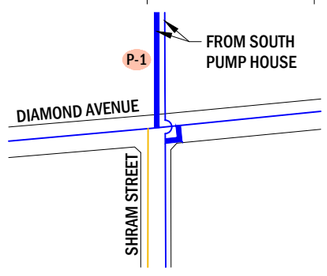
P-1 P-2 P-3

N S

IMPROVEMENT REPAIR ID'S
- P-1
- P-2
- P-3
- Z1-1
- Z1-2
- Z1-3
- Z1-4
- Z1-5
- Z1-6
- Z1-7
- Z1-8
- Z1-9
- Z1-10

SCALE 1:25 000

0 250 500 750 m



DETAIL "A"

NOTE:
1. THE EXISTING 300mm DIA WM IS ASBESTOS CEMENT PIPE AND REQUIRED TO BE REPLACED. DUE TO THE UNFAVORABLE EXISTING GROUND CONDITION, THIS PIPE CAN BE ABANDONED. TO MAINTAIN ACHIEVING FIRE FLOW, WITHIN THE AREA WITHOUT THIS WM, IT IS PROPOSED TO UPGRADE THE EXISTING 250mm ALONG GREYSTONE DR TO A PROPOSED 300mm DIA, AS SHOWN ON THIS FIGURE.
2. IF THE HYDRANTS ARE TIED INTO THE EXISTING 300mm DIA WM, THE EXISTING 150mm DIA WM CAN BE ABANDONED OR REMOVED.

LEGEND

CITY LIMITS	EX 100mm WATERMAIN	PROP 200mm WATERMAIN
STUDY AREA	EX 150mm WATERMAIN	PROP 250mm WATERMAIN
EX PRESSURE ZONE BOUNDARY	EX 200mm WATERMAIN	PROP 300mm WATERMAIN
PROP PRESSURE ZONE BOUNDARY	EX 250mm WATERMAIN	PROP 400mm WATERMAIN
EX NORTH/SOUTH PUMP HOUSE (N S)	EX 300mm WATERMAIN	PROP 250mm WM SYSTEM IMPROVEMENT
EX PRESSURE REDUCING VALVE	EX 350mm WATERMAIN	IMPROVEMENT REPAIR ID Z1-1
EX FLOW CONTROL VALVE	EX 400mm WATERMAIN	SATISFIES FIRE FLOW
PROP PRESSURE REDUCING VALVE	EX 450mm WATERMAIN	DOES NOT SATISFY FIRE FLOW
PROP GATE VALVE TO BE CLOSED	EX 500mm WATERMAIN	
	EX 600mm WATERMAIN	
	EX 750mm WATERMAIN	

FIGURE 5.4A
WATER MASTER PLAN PROPOSED PRIORITY WATERMAIN UPGRADES

The City of SPRUCE GROVE

February 8, 2022 02-21089-F5.4A.DWG

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 4

GROVE DRIVE

COPPERHAVEN DR

JENNIFER HEIL WAY

TOWN OF STONY PLAIN

PARKLAND COUNTY

PRV-1 PRV-2 PRV-3 PRV-4 PRV-5 PRV-6 PRV-7 PRV-8 PRV-9

N FCV

L-1 F-1 M-1 G-1 H-1 H-2 H-3 H-4 W-1 W-2 W-3 W-4 E-1 E-2 E-3 B-1 B-2 B-3

INKSIDE

FIELDSTONE

CALAHOO ROAD

KING STREET

CENTURY ROAD

GREYSTONE DRIVE

PIONEER ROAD

MOBILE CITY ESTATES

MCLEOD AVE

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAIL

SOUTH AVENUE

SHEP ST

S

ALBERTA AVENUE

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TAMARACK DRIVE

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

IMPROVEMENT REPAIR ID'S

- B-1
- B-2
- B-3
- E-1
- E-2
- E-3
- F-1
- G-1
- H-1
- H-2
- H-3
- H-4
- L-1
- M-1
- W-1
- W-2
- W-3
- W-4

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F5.4B.DWG

LEGEND

- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- EX NORTH/SOUTH PUMP HOUSE (N S)
- EX PRESSURE REDUCING VALVE
- EX FLOW CONTROL VALVE
- EX 100mm WATERMAIN
- EX 150mm WATERMAIN
- EX 200mm WATERMAIN
- EX 250mm WATERMAIN
- EX 300mm WATERMAIN
- EX 350mm WATERMAIN
- EX 400mm WATERMAIN
- EX 450mm WATERMAIN
- EX 500mm WATERMAIN
- EX 600mm WATERMAIN
- EX 750mm WATERMAIN
- PROP 200mm WATERMAIN
- IMPROVEMENT REPAIR ID (B-1)

FIGURE 5.4B

WATER MASTER PLAN PROPOSED NON-PRIORITY WATERMAIN UPGRADES

The City of SPRUCE GROVE

HIGHWAY 16

HIGHWAY 16

PRESSURE ZONE 2

PROPOSED PRESSURE ZONE 4

PRV-15

PRV-6

PRV-7

PRV-8

PRV-9

PRV-10

PRV-11

PRV-12

GROVE DRIVE

PRV-5

N

FCV

PRV-4B

PROPOSED PRESSURE ZONE 3

PRESSURE ZONE 2

PARKLAND COUNTY

TOWN OF STONY PLAIN

JENNIFER HELL WAY

CALHOO ROAD

CENTURY ROAD

PRV-2

PRV-4A

PRV-4

PIONEER ROAD

PRV-13

PRV-1

PRV - 14

PRV-3

PRESSURE ZONE 1

EASTON DEVELOPMENT

BALL DIAMOND DEVELOPMENT

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAIL

HIGHWAY 16A

S

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TOWN OF STONY PLAIN

PARKLAND COUNTY

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

NOTE:
THE LIMITS OF THE PROPOSED WATERMAIN EXPANSION WILL BE DETERMINED AT THE DETAIL DESIGN STAGE BASED ON THE FUTURE DEVELOPMENT WATER SYSTEM REQUIREMENTS IN AGREEMENT WITH THE CITY OF SPRUCE GROVE.

SCALE 1:25 000

0 250 500 750 m

February 8, 2022 02-21089-F5.5.DWG

LEGEND

- CITY LIMITS
- STUDY AREA
- EX PRESSURE ZONE BOUNDARY
- EX NORTH/SOUTH PUMP HOUSE (N / S)
- EX PRESSURE REDUCING VALVE
- PROP PRESSURE REDUCING VALVE
- EX FLOW CONTROL VALVE
- PROP GATE VALVE TO BE CLOSED
- 5 YEAR PHASE AREA
- 15 YEAR PHASE AREA
- +25 YEAR PHASE AREA
- 100mm WATERMAIN
- 150mm WATERMAIN
- 200mm WATERMAIN
- 250mm WATERMAIN
- 300mm WATERMAIN
- 350mm WATERMAIN
- 400mm WATERMAIN
- 450mm WATERMAIN
- 500mm WATERMAIN
- 600mm WATERMAIN
- 750mm WATERMAIN

FIGURE 5.5
WATER MASTER PLAN WATER DEMAND PHASING EXPANSION

The City of SPRUCE GROVE

HIGHWAY 16

HIGHWAY 16

PRESSURE ZONE 2

PRESSURE ZONE 4

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 1

PRESSURE ZONE 3

PRV-1
PRV-2
PRV-3
PRV-4
PRV-4A
PRV-4B
PRV-5
PRV-6
PRV-7
PRV-8
PRV-9
PRV-10
PRV-11
PRV-12
PRV-13
PRV-14
PRV-15

N FCV

S

GROVE DRIVE

GROVE DRIVE

JENNIFER HELL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

PARKLAND COUNTY

TOWN OF STONY PLAIN

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAIL

DIAMOND AVENUE

CAMPSITE ROAD

GOLDEN SPIKE ROAD

TOWN OF STONY PLAIN

PARKLAND COUNTY

PARKLAND COUNTY

RANGE ROAD 274

RANGE ROAD 273

RANGE ROAD 272

RANGE ROAD 271

RANGE ROAD 270

HIGHWAY 628

LEGEND

CITY LIMITS	EX 100mm WATERMAIN	PROP 200mm WATERMAIN
STUDY AREA	EX 150mm WATERMAIN	PROP 250mm WATERMAIN
EX PRESSURE ZONE BOUNDARY	EX 200mm WATERMAIN	PROP 300mm WATERMAIN
PROP PRESSURE ZONE BOUNDARY	EX 250mm WATERMAIN	PROP 400mm WATERMAIN
EX NORTH/SOUTH PUMP HOUSE (N / S)	EX 300mm WATERMAIN	
EX PRESSURE REDUCING VALVE	EX 350mm WATERMAIN	
PROP PRESSURE REDUCING VALVE	EX 400mm WATERMAIN	
EX FLOW CONTROL VALVE	EX 450mm WATERMAIN	
CLOSED GATE VALVE	EX 500mm WATERMAIN	
	EX 600mm WATERMAIN	
	EX 750mm WATERMAIN	

NOTE:
1. THE EXISTING 150mm DIA WATERMAIN SHALL BE UPGRADED TO 200mm DIA WATERMAIN AS PART OF THE CITY ROAD UPGRADE PROGRAM.

SCALE 1:25 000

0 250 500 750 m

FIGURE 5.6
WATER MASTER PLAN PROPOSED WATER DISTRIBUTION SYSTEM - 2025

The City of SPRUCE GROVE

February 8, 2022 02-21089-F5.6.DWG

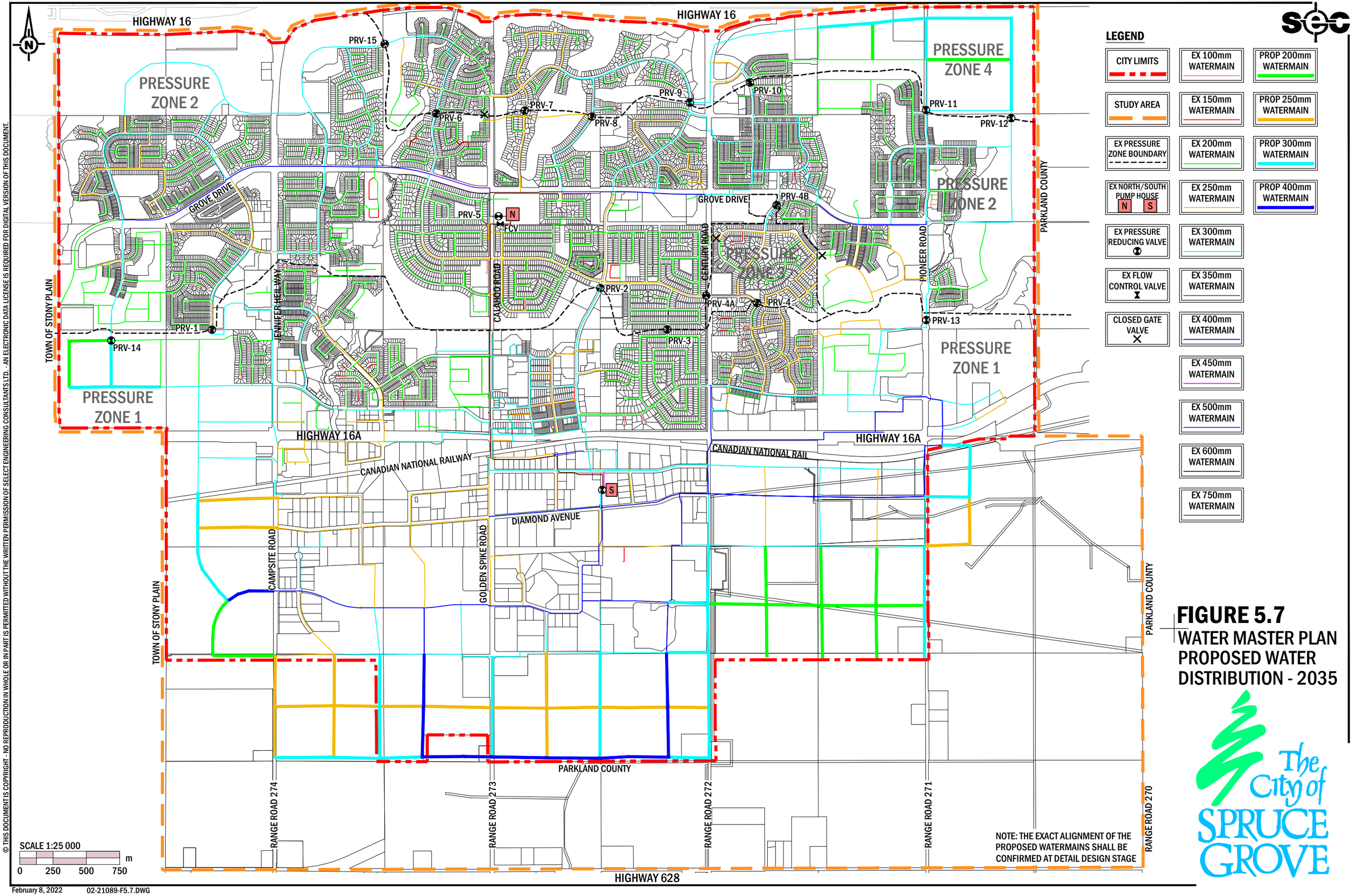
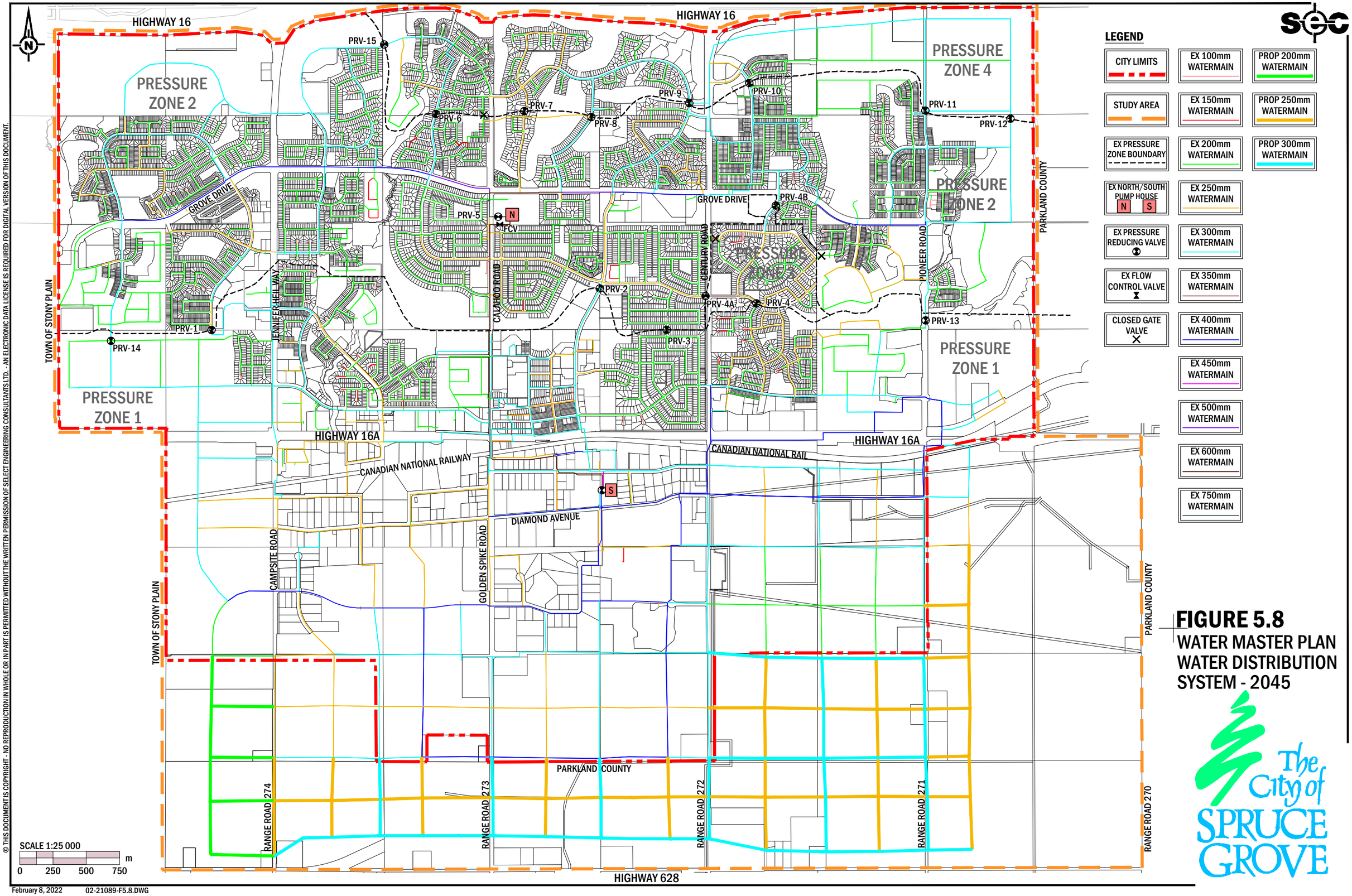


FIGURE 5.7
WATER MASTER PLAN PROPOSED WATER DISTRIBUTION - 2035

The City of SPRUCE GROVE

February 8, 2022 02-21089-F5.7.DWG



February 8, 2022 02-21089-F5.8.DWG

FIGURE 5.8
WATER MASTER PLAN WATER DISTRIBUTION SYSTEM - 2045

The City of SPRUCE GROVE

6.0 Cost Estimate

High level estimates have been prepared to assist with planning and developing capital infrastructure budgets to address identified system deficiencies. The cost estimates presented are based on 2021 construction values and include an allowance for engineering (15%) and contingency (20%) but do not include G.S.T.

System improvements with cost estimates have been segregated into six categories based on locale with the City that include:

- **Priority System Improvements**
  - South Pumphouse upgraded connections to distribution system
- **Downtown District**
  - upgraded system to accommodate higher density land uses
- **Zone 1**
  - water distribution network upgrades
- **Zone 2**
  - Water distribution network upgrades
- **Zone 3**
  - proposed PRV's installation and re-set HGL
- **Zone 4**
  - install eight (8) PRV's c/w water distribution network upgrades

Priority System Upgrades

Table 6.1.1: Priority System Upgrades

ID	Cost Estimate
P-1	$400,000
P-2	$2,150,000
P-3	$220,000
Total	**$2,770,000**

Downtown District System Improvements

The proposed improvements within the Downtown core area are based on the proposed Area Redevelopment Plan (ARP), 2018 provided by the City of Spruce Grove. The land uses within the Downtown Core area are currently zoned as commercial (C1) and planned for higher density residential development combined with mixed use commercial.

Phasing of the improvements is recommended and has been prioritized based on the ultimate infill of the areas proposed for higher-density land uses. In 2019, Select Engineering completed "Downtown Watermain Improvements Implementation Plan" report, identifying the following recommended phases of improvements:

Table 6.1.2: Downtown District Improvements

ID	Cost Estimate
D-1	$750,000
D-2	$300,000
D-3	$570,000
D-4	$530,000
D-5	$300,000
D-6	$825,000
D-7	$755,000
D-8	$650,000
D-9	$600,000
D-10	$1,500,000
D-11	$600,000
D-12	$600,000
D-13	$450,000
D-14	$275,000
D-15	$675,000
D-16	$200,000
Total	**$9,575,000**

Zone 1 System Improvements

The following table summarizes the water distribution system improvements required to meet City of Spruce Grove level of service for the water distribution system within Zone 1 (not including the Downtown District recommended improvements per Table 6.1.2).

Table 6.1.3: Zone 1 Improvements

ID	Cost Estimate
Z1-1	$3,325,000
Z1-2	$855,000
Z1-3	$600,000
Z1-4	$490,000
Z1-5	$390,000
Z1-6	$935,000
Z1-7	$750,000
Z1-8	$375,000
Z1-9	$570,000
Z1-10	$1,150,000
Total	**$9,440,000**

Zone 2 System Improvements

The following table summarize the existing water distribution system improvements required to meet City of Spruce Grove standards for water distribution system within Zone 2, outside Downtown area:

Table 6.1.4: Zone 2 Improvements

ID	Cost Estimate
Z2-1	$250,000
Z2-2	$600,000
Z2-3	$ 50,000
Z2-4 *	$13,500,000
Total	**$14,400,000**

* this cost reflects 150mm diameter mains to be upgrade to 200mm diameter PVC mains in conjunction with neighbourhood renewal programs and not considered as priority projects themselves.

Zone 3 System Modifications

The following table summarize the existing water distribution system changes required to meet City of Spruce Grove standards for water distribution system to create the new pressure Zone 3:

Table 6.1.5: Zone 3 Improvements

ID	Cost Estimate
Z3-1	$5,000
Z3-2	$200,000
Z3-3	$250,000
Total	**$455,000**

Zone 4 System Modifications

The following table summarize the system additions required develop Zone 4:

Table 6.1.6: Zone 3 Improvements

ID	Cost Estimate
Z4-1	$250,000
Z4-2	$200,000
Z4-3	$250,000
Z4-4	$250,000
Z4-5	$250,000
Z4-6	$250,000
Z4-7	$2,000,000
Total	**$3,200,000**

Leviable Water System Components

The City of Spruce Grove has mandated that watermain distribution mains equal to or larger than 400mm diameter are subject to an off-site levy.

Based on the proposed water network developed with the water model analysis, the following developments, were identified to be serviced by a proposed watermain equal to or larger than 400mm diameter.

Spruce Grove East – Easton and Ball Diamond Developments

Easton and Ball Diamond are located within the Spruce Grove East development area, within the quarter sections north of Highway 16A that flank each site of Pioneer Road. The total area measures approximately 85.8 ha.

In 2020 an HNA report was completed to determine the proposed water system sizing for the Easton subdivision. **Figure 5.5** illustrates the proposed water system. Results indicate that a 400mm diameter watermain is required to satisfy fire flow requirements.

The proposed 400mm diameter waterline is proposed to be extended from a 400mm diameter watermain south of Highway 16A to the south development boundary of the Easton development. The main will continue north east through Easton along McLeod Avenue east of Pioneer Road to the Ball Diamond site. The loop will require turning south through Ball Diamond, crossing Highway 16A and stubbed south of the Highway. This watermain loop is required to satisfy fire flow requirements for the commercial land-use within Easton, Ball Diamond and the proposed developments along the south side of Highway 16A, adjacent to Easton and Ball Diamond areas.

The cost estimate of the proposed 400 mm diameter watermains within this development is based on the 2021 construction cost and is summarized in **Table 6.1.7**.

Table 6.1.7: Leviable Cost Estimate – Spruce Grove East

ID	Location	Watermain Dia. (mm)	Length (m)	Cost
L-1	Easton, Ball Diamond, and South of Highway 16A	400	1,500	$3,300,000

South Industrial

As shown on Figure 6.3 the following table summarize the watermains proposed to be upgraded to 400 mm diameter watermain to satisfy fire flow requirements as per City of Spruce Grove standards for industrial land use.

Table 6.1.8: Leviable Cost Estimate – South Industrial Trunk Main

ID	Location	Watermain Dia. (mm)	Length (m)	Cost
L-2	Diamond Ave	400	2,000	$4,400,000

Pressure Reducing Valve and Chambers

Twelve (12) additional Pressure Reducing Valves (PRVs) are ultimately required to service full build-out of development as identified in 2025 Proposed Water Distribution System condition. The twelve (12) Pressure Reducing Valve (PRV) components could be considered as leviable infrastructure as they benefit multiple developers across each pressure zone. The predicted locations for the PRVs are identified in **Figure 5.6**.

Table 6.1.9: Leviable Cost Estimate – PRVs

ID	Location	Cost
L-3	PRV No. 13 – Zone 1 and 2 (east)	$250,000
L-4	PRV No. 14 – Zone 1 and 2 (west)	$250,000
L-5	PRV No. 6,7,8,9 & 10 - Zone 4 (install within existing system)	$1,250,000
L-6	PRV No. 11, 12 & 15 - Zone 4 (proposed for expanded system)	$450,000
TOTAL		**$2,200,000**

The following table summarize the proposed leviable infrastructure costs:

Table 6.1.10: Summary of Leviable Infrastructure Costs

ID	Cost Estimate
L-1	$3,300,000
L-2	$4,400,000
L-3	$250,000
L-4	$250,000
L-5	$1,250,000
L-6	$450,000
Total	**$9,900,000**

7.0 Conclusions and Recommendations

Water Distribution System

The current water distribution system does not meet some design criteria per the City of Spruce Grove's 2015 Municipal Design Standards.

- the existing watermain don't have the capacity to meet Peak Day Demand plus Fire Flow Demand (PDD+FF) due to the aging and undersized mains
- to meet the Peak Day plus Fire Flow Demand (PDD+FF) levels, a significant number of distribution mains need to be upsized
- the current distribution system does not meet the recommended operating pressure range of 350 kPa to 550 kPa with two (2) pressure zones
- two (2) new pressure zones are proposed to be created to provide reasonable end user operating pressures
- development of Pressure Zone 3 is recommended to address end user concerns
- development of Pressure Zone 4 is recommended to address end use concerns and future development of the area

Zone 1 Pumphouse

- The existing water distribution pumps have the capacity to supply peak hour demand within Zone 1 and to fill up the storage reservoir within Zone 2 during the low water demand periods. This condition should be monitored for performance as the City's end users/consumption increase over time.
- The existing fire pump has the capacity to provide fire flow protection for the entire City of Spruce Grove.
- The distribution pumps will be required to be upgraded before 2040.

Zone 2 Pumphouse

- the existing water distribution pumps have the capacity to supply Peak Hour Demand (PHD) within Zone 2
- the distribution pumps will be required to be reassessed and upgraded before 2040

Storage Water Reservoir

The existing water storage reservoir has adequate capacity to meet the storage capacity based on a maximum servicing population of 75,000 people.

Regional Water Supply

- The Capital Region Parkland Water Services Commission (CRPWSC) provides water to the City of Spruce Grove. There are two existing, 600mm and 300 mm diameter water transmission main and a third 600 mm diameter transmission water main is currently under construction and anticipated to be completed in 2022.
- All transmission waterline supplies water direct to the Zone 1 Reservoir at a rate of 1.8 x Average Day Demand (ADD) rather than 2.0 x ADD. This condition should be reviewed periodically to ensure adequate water supply is available as the City continues to grow.
- The addition of the third water supply main combined with the available storage capacity in the City's reservoirs should provide sufficient level of redundancy to ensure system shutdowns can be managed.

Leviable Water Distribution System Infrastructure

- The larger mains are required to facilitate the ultimate build-out of the City's distribution system and will mitigate any risk for upsizing for future development.
- The City of Spruce Grove currently considers larger diameter watermains equal to or larger than 400mm diameter a leviable asset to formulate an equitable distribution of initial construction costs between all benefiting developable lands.
- The City's distribution system has historically operated with two (2) pressure zones to service the entire city that are controlled by four (4) Pressure Reducing Valve chambers. Modifying the distribution system to create four (4) pressure zones will require an additional eight (8) Pressure Reducing Valve chambers.
- The City of Spruce Grove may want to consider including Pressure Reducing Valves as leviable assets:
  - as their function addresses large servicing areas across several developments
  - each facility is worth a significant cost to supply and install
  - regulatory maintenance is considered minimal

8.0 Report Submittal

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

Steve Brittain, C.E.T.
Municipal Manager

Floarea Zerfass, P. Eng.
Project Manager

APPENDIX A

Water Consumption Record Data

ANNUAL WATERWORKS REPORT 2020

Class 3 Water Distribution System

AEP Registration no. 1175-02-00

COMBINED ZONES

Water Consumption Record Data Summary, L/c/d						
Year	2016	2017	2018	2019	2020	Water Consumption L/c/d
Total Population	*33,640*	*34,881*	*35,766*	*36,651*	*37,100*	
JANUARY	219.12	215.27	223.49	202.66	200.39	212.19
FEBRUARY	217.04	211.70	217.06	205.95	198.43	210.04
MARCH	218.00	213.48	217.53	210.06	204.40	212.69
APRIL	243.81	213.22	221.89	210.36	209.14	219.69
MAY	274.44	234.10	267.42	233.05	225.52	246.91
JUNE	255.53	236.56	255.28	224.71	224.07	239.23
JULY	240.80	260.47	245.73	207.60	223.16	235.55
AUGUST	239.14	234.94	233.38	213.20	226.00	229.33
SEPTEMBER	230.00	233.73	215.95	209.51	214.99	220.84
OCTOBER	226.63	223.29	213.90	206.53	212.25	216.52
NOVEMBER	224.68	269.26	209.88	202.22	210.24	223.25
DECEMBER	224.25	280.64	218.43	205.68	202.26	226.25
						224.37

COMBINED ZONES - Average Day Demand Summary, L/s						
Year	2016	2017	2018	2019	2020	ADD L/s
Total Population	*33,640*	*34,881*	*35,766*	*36,651*	*37,100*	
JANUARY	85.32	86.91	92.52	85.97	86.05	92.52
FEBRUARY	84.51	85.47	89.86	87.36	85.20	89.86
MARCH	84.88	86.19	90.05	89.11	87.77	90.05
APRIL	94.93	86.08	91.85	89.24	89.81	94.93
MAY	106.85	94.51	110.70	98.86	96.84	110.70
JUNE	99.49	95.50	105.68	95.32	96.21	105.68
JULY	93.76	105.15	101.72	88.07	95.83	105.15
AUGUST	93.11	94.85	96.61	90.44	97.04	97.04
SEPTEMBER	89.55	94.36	89.39	88.87	92.32	94.36
OCTOBER	88.24	90.14	88.54	87.61	91.14	91.14
NOVEMBER	87.48	108.71	86.88	85.78	90.27	108.71
DECEMBER	87.31	113.30	90.42	87.25	86.85	113.30
						113.30

COMBINED ZONES - Maximum Day Demand Summary, L/s						
Year	2016	2017	2018	2019	2020	MDD L/s
Total Population	*33,640*	*34,881*	*35,766*	*36,651*	*37,100*	
JANUARY	109.16	104.68	119.51	97.01	115.07	119.51
FEBRUARY	105.52	103.94	123.33	114.49	108.43	123.33

MARCH	105.35	114.63	113.44	110.67	105.20	114.63
APRIL	167.73	101.04	105.47	108.13	110.65	167.73
MAY	156.75	145.09	148.62	133.54	117.44	156.75
JUNE	133.47	119.49	139.02	132.47	146.50	146.50
JULY	126.91	128.61	140.09	99.38	117.58	140.09
AUGUST	112.26	111.62	126.42	107.07	118.82	126.42
SEPTEMBER	104.42	112.27	117.63	116.79	105.58	117.63
OCTOBER	101.60	114.16	107.21	103.62	100.39	114.16
NOVEMBER	104.14	282.97	107.79	98.65	109.56	282.97
DECEMBER	98.54	282.81	134.92	105.17	104.14	282.81
						282.97

APPENDIX B

Pump Curves

SURE-FORM CONTRACTING

2903-121 Avenue NE
Edmonton AB T6S 1E6
Phone (780) 475-2121
Fax (780) 475-5152

Submittal

Job: 1090
Zone 1 Reservoir &Pump Station
City of Spruce Grove
400 South Avenue

Spec Section No: CCN-013R1
Submittal No: 002
Revision No: 1
Sent Date: Wednesday, October 31, 2018

Spec Section Title:

Submittal Title: Zone 2 Pumps

Contractor:
Sure-Form Contracting Ltd.
Chad Maloney

Contractor's Stamp

SHOP DRAWING REVIEW COMMENTS

Status:

Remarks: Resubmission for Review

Reviewed by: Chad Maloney

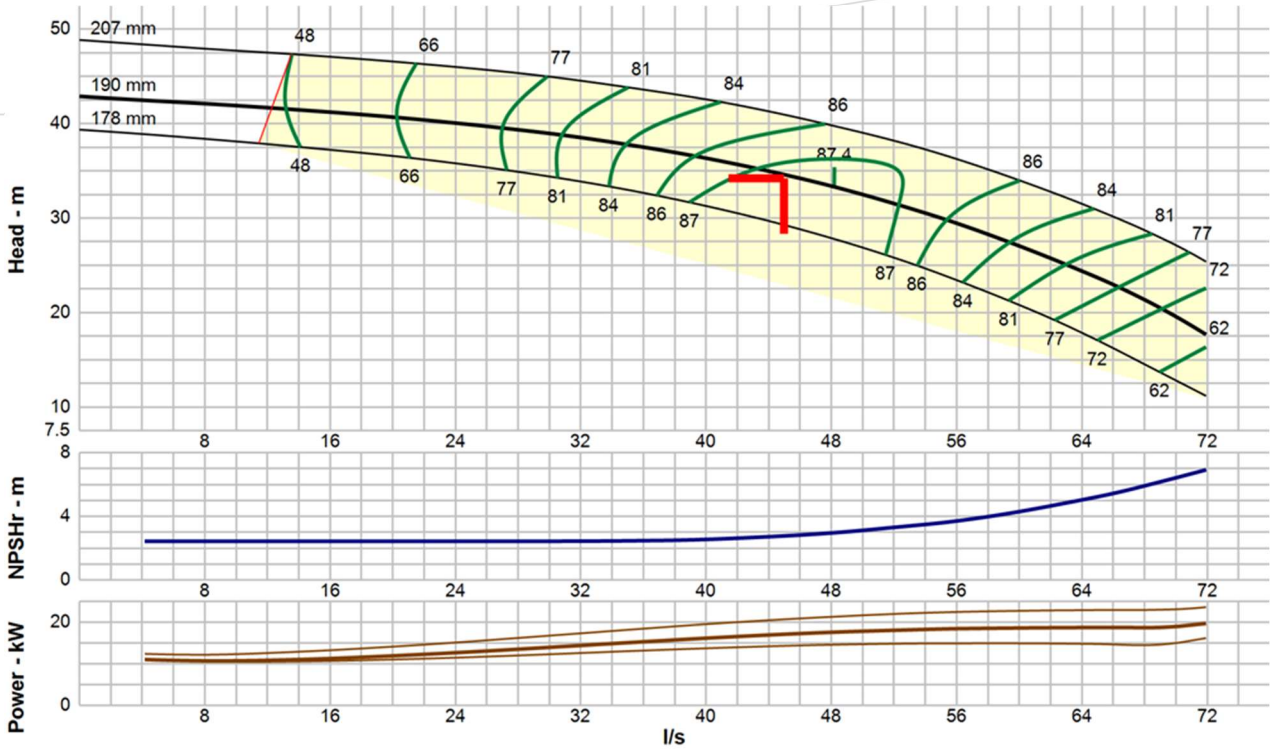
Review Date: October 31, 2018

Engineer:
ISL Engineering & Land Service
Greg Germain

GOULDS WATER TECHNOLOGY
a xylem brand

PERFORMANCE CURVE

Quote ID: 9003-181012-008:0:1 QTY: 1
VIT-DIFM 11CMC, 2 Stages



CURVE DATA

Specified Flow	45.00 l/s	**Shut Off TDH (Bowl)**	42.9 m	**Specified NPSH Ratio**	1.1
Specified TDH	34.20 m	**Shut Off TDH (Disch Flange)**	41.7 m	**NPSH Margin at Design**	11.0 m
Motor Speed	1770 RPM	**Shut Off Pressure (Bowl)**	420.1 kPa	**Min Submergence at Design**	695.31 mm
Atmospheric Pressure	1014 mbar	**Shut Off Pressure (Disch Flange)**	4080.7 mbar	**Actual Submergence**	4000.00 mm
TPL	5.00 m	**Bowl Efficiency at Design**	87.20 %	**Shaft Friction Power Loss**	0.05 kW
Pumping Level	1.00 m	**Best Efficiency**	87.40 %	**Thrust Load Power Loss**	0.08510 kW
NPSHa at Grade	712.6 m	**BEP Flow**	48.2 l/s	**Hydraulic Thrust at Design**	3528.8 N
NPSHa at 1st Impeller	13.8 m	**Design Flow % BEP**	93.36 %	**Thrust at Design**	4273.3 N
Fluid	Water	**Pump Efficiency**	86.15 %	**Hydraulic Thrust at Shut Off**	4375.3 N
Fluid Temperature	20.0 °C	**Motor Efficiency**	93.60 %	**Thrust at Shut Off**	5196.2 N
Specific Gravity	1.0000	**Overall Efficiency**	80.64 %	**Bowl Material**	Cast Iron with Glass Enamel
Viscosity	0.0010 Pas	**Friction Loss at Design**	0.15 m		
Vapor Pressure	23.3932 mbar	**Power at Design**	17.1 kW	**Bowl Material Derate Factor**	1.00
Density	998 kg/m³	**NOL Power**	19.7 kW	**Impeller Material**	316SS
Design Flow	0.0 m³/s	**Max Power (NOL) Flow**	71.9 l/s	**Impeller Matl Derate Factor**	1.00
Min Flow (MCSF)	12.0 l/s	**Max Power (NOL) at Max Trim**	23.6 kW	**Total Flow Derate Factor**	1.00
Design TDH (Bowl)	34.6 m	**Max Power (NOL) Flow at Max Trim**	71.9 l/s	**Total Head Derate Factor**	1.00
Design TDH (Disch Flange)	33.2 m			**Total Efficiency Derate Factor**	1.00
Design Pressure (Bowl)	3388.2 mbar	**Recommended Power**	20.00 kW	**Curve ID**	E6411CGPC2
Design Pressure (Disch Flange)	3253.7 mbar	**kWh per 1000 gal**	0.44204		
		NPSHr at Design	2.8 m		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

Certified By		
Project		
Tag		
PO Number		
Serial Number		

Superior Equipment Sales Inc.
10549-110th St. Edmonton Alberta
Phone # 426-6991
Fax # 425-1768

To: Schendel Mechanical
Attn: Toby MacDonald

Date: April 13, 2016

Regarding: Spruce Grove Zone 1 Upgrades – Shop Drawing Submital

Distribution Pumps – 92-P-001 & -002

Revision 1

Superior/Goulds 14RJLC 2 stg Vertical Turbine Pumps

USEM 100hp motor data

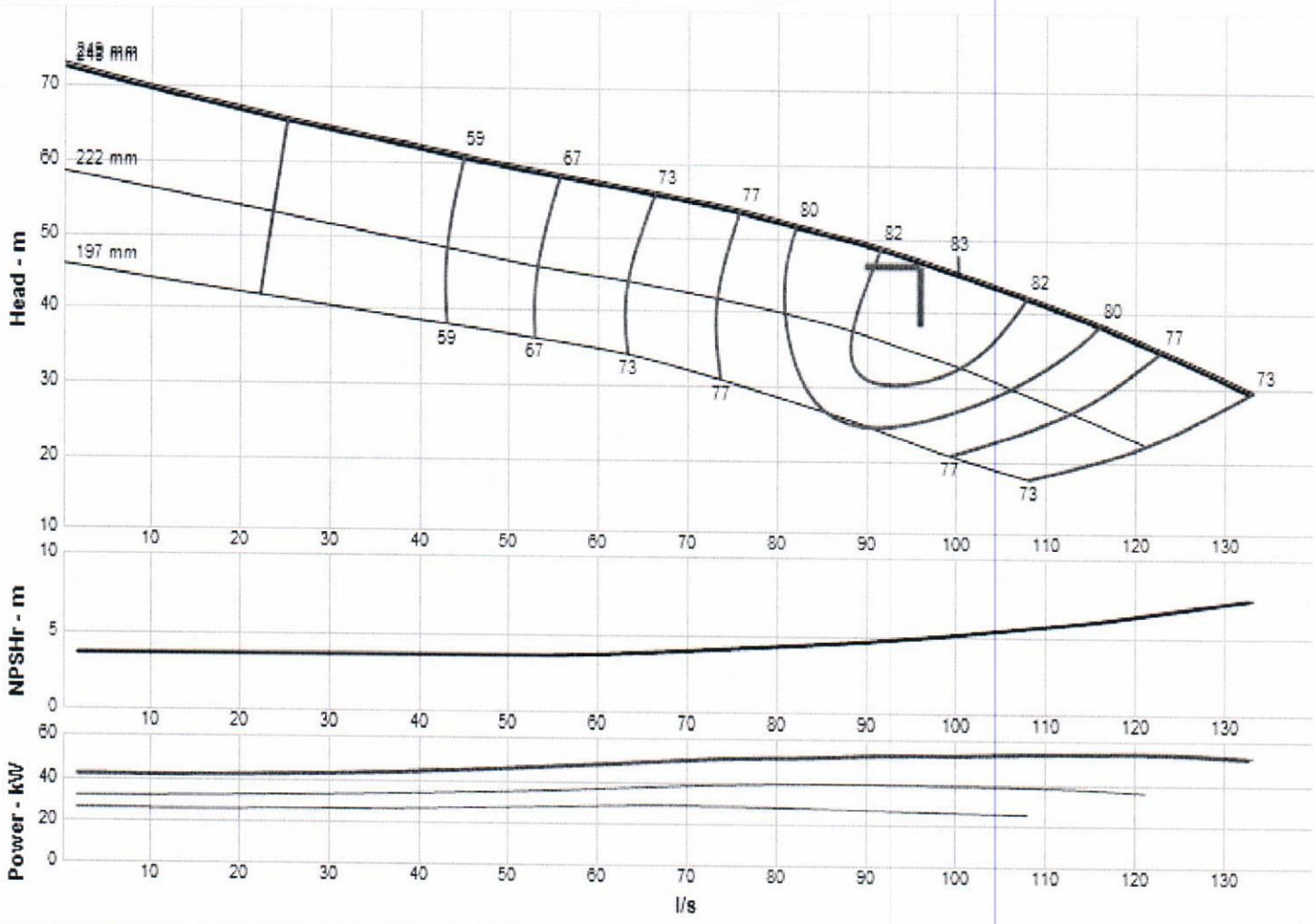
Comments;

- 304SS strainer added, pump length adjusted
- All columns lengths to be 1.52m max
- Skotckote 134 data sheet included (covers all pumps)
- Pump and motor cannot be lifted as one complete unit. Motor is not designed to handle weight of pump unit. Motor and pump are too be lifted as two separate units only. Failure to do so will result in in-repairable damage to motor frame and possible separation of pump from motor. Applies to all pump units. Goulds and Superior Equipment will not be responsible for any damage or injury/loss of life from failure to lift units in proper manner.

GOULDS WATER TECHNOLOGY
a xylem brand

PERFORMANCE CURVE

Quote Number: 9003-160406-007:1
Model: VIT-FFFM
Size: 14RJLC 2 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	83.00 %
Speed:	1770	Flow at BEP:	100.00 LitersPerSecond
Impeller Trim:	248.0005 mm	Min Flow:	25.00 LitersPerSecond
Frequency:	60 Hz	Derate Factor:	0.0000
Additional Impeller Trim:	248.006 mm	NPSH Required:	4.97 m
Impeller Maximum Trim:	248.9987 mm	Specified NPSH Avail:	10.36 m
Specified Flow:	96.00 LitersPerSecond	Shut-Off Head:	72.50 m
Specified Head:	46.00 m	Fluid Type:	Water
Head at Design:	46.60 m	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	82.60 %	Viscosity:	0.9695 cP
Power at Design:	53.00 kW	Allowable Sphere Size:	26.92 mm
Flow on Design Trim at Max Power:	116 LitersPerSecond	Thrust K Factor:	12.9700 lbs/ft
Max Power on Design Curve:	54.10 kW	Additional Thrust K Factor:	12.9700 lbs/ft
Run-Out Flow:	0.00 LitersPerSecond	Max Lateral:	31.75 mm
Run-Out Head:	0 m		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag	

Superior Equipment Sales Inc.
10549-110th St. Edmonton Alberta
Phone # 426-6991
Fax # 425-1768

To: Schendel Mechanical
Attn: Toby MacDonald

Date: May 2, 2016

Regarding: Spruce Grove Zone 1 Upgrades – Shop Drawing Submital

Distribution Pump 92-P-003

Revision 1

Superior/Goulds 14FHC 5 stg Vertical Turbine Pumps

USEM 125hp motor data

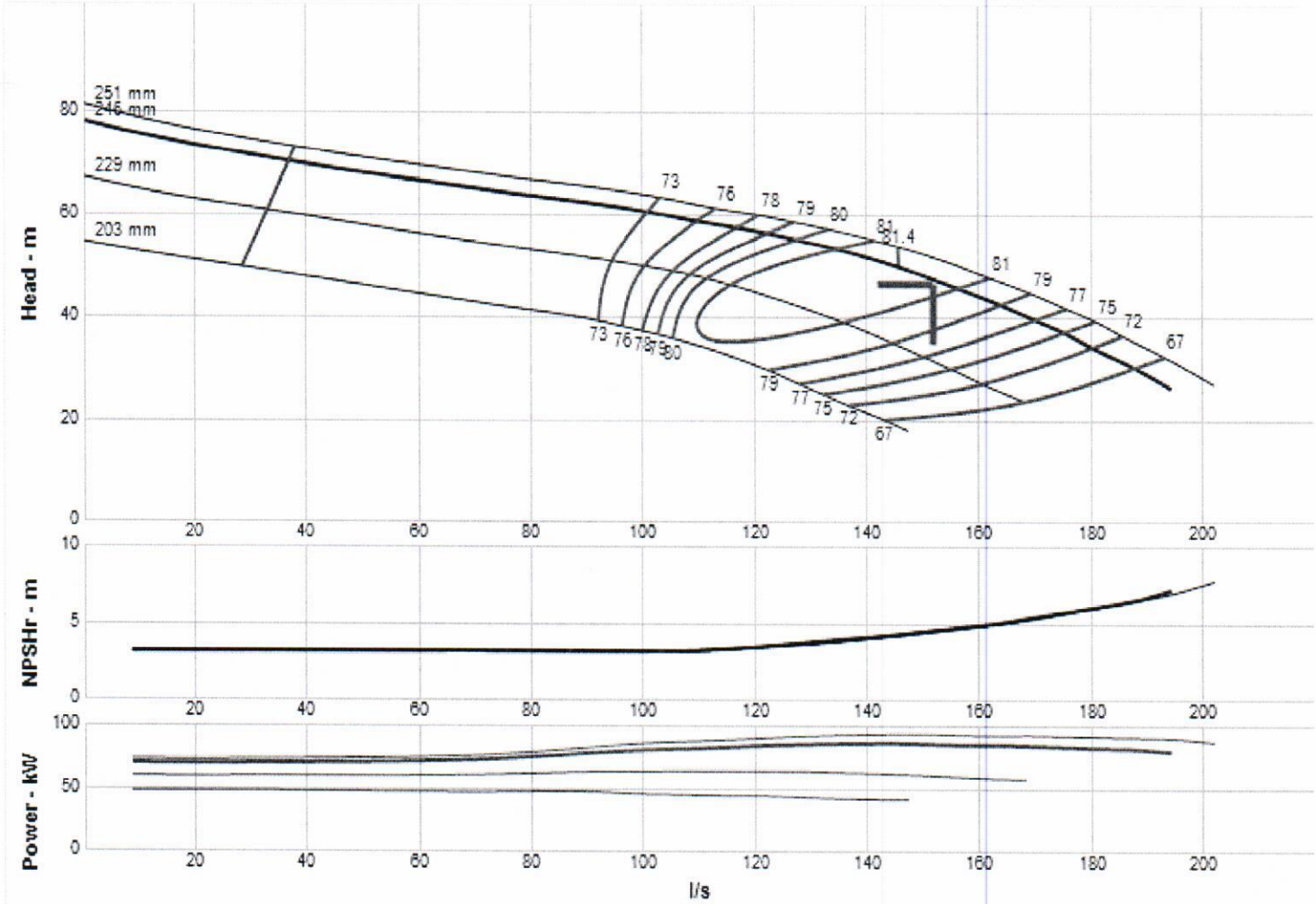
Comments;

- 304SS strainer added, pump length adjusted
- All columns lengths to be 1.52m max
- Skotckote 134 data sheet included (covers all pumps)
- Pump and motor cannot be lifted as one complete unit. Motor is not designed to handle weight of pump unit. Motor and pump are too be lifted as two separate units only. Failure to do so will result in in-repairable damage to motor frame and possible separation of pump from motor. Applies to all pump units. Goulds and Superior Equipment will not be responsible for any damage or injury/loss of life from failure to lift units in proper manner.

Bell & Gossett
a xylem brand

PERFORMANCE CURVE

Quote Number: 9003-160412-012:1
Model: VIT-FFFM
Size: 14FHC 5 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	81.40 %
Speed:	1180	Flow at BEP:	146.00 LitersPerSecond
Impeller Trim:	245.9990 mm	Min Flow:	36.40 LitersPerSecond
Frequency:	60 Hz	Derate Factor:	0.0000
Additional Impeller Trim:	245.999 mm	NPSH Required:	4.63 m
Impeller Maximum Trim:	251.0003 mm	Specified NPSH Avail:	10.36 m
Specified Flow:	152.00 LitersPerSecond	Shut-Off Head:	78.00 m
Specified Head:	46.00 m	Fluid Type:	Water
Head at Design:	47.20 m	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	81.10 %	Viscosity:	0.9695 cP
Power at Design:	86.20 kW	Allowable Sphere Size:	44.45 mm
Flow on Design Trim at Max Power:	146 LitersPerSecond	Thrust K Factor:	17.0000 lbs/ft
Max Power on Design Curve:	87.10 kW	Additional Thrust K Factor:	17.0000 lbs/ft
Run-Out Flow:	0.00 LitersPerSecond	Max Lateral:	25.40 mm
Run-Out Head:	0 m		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag	

Superior Equipment Sales Inc.
10549-110th St. Edmonton Alberta
Phone # 426-6991
Fax # 425-1768

To: Schendel Mechanical
Attn: Toby MacDonald

Date: May 2 , 2016

Regarding: Spruce Grove Zone 1 Upgrades – Shop Drawing Submital

High Flow & Standby Pumps 92-P-004 & -005

Revision 1

Superior/Goulds 20RCHC 2 stg Vertical Turbine Pumps

USEM 250hp motor data]

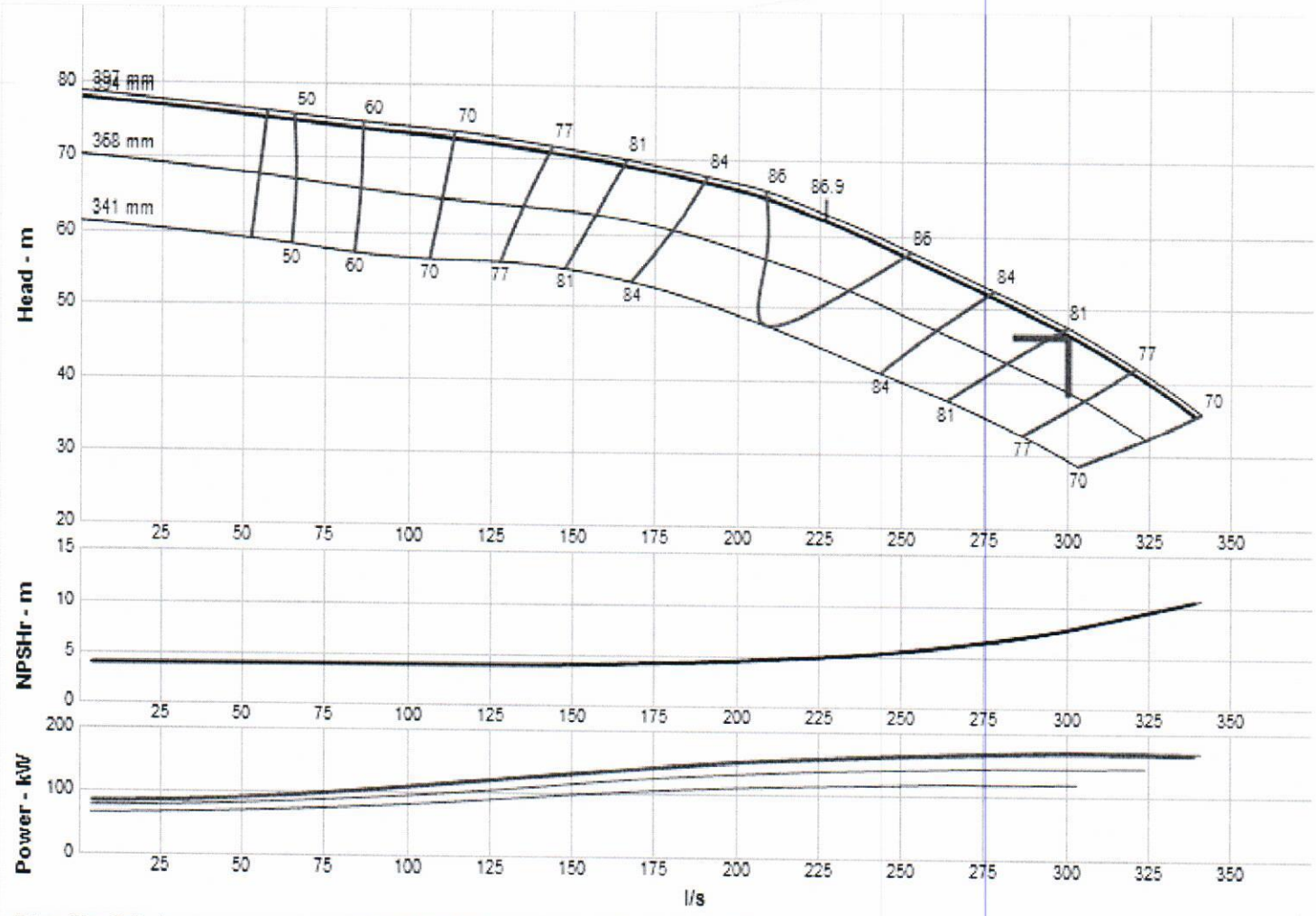
Comments;

- 304SS strainer added, pump length adjusted
- All columns lengths to be 1.52m max
- Skotckote 134 data sheet included (covers all pumps)
- Pump and motor cannot be lifted as one complete unit. Motor is not designed to handle weight of pump unit. Motor and pump are too be lifted as two separate units only. Failure to do so will result in in-repairable damage to motor frame and possible separation of pump from motor. Applies to all pump units. Goulds and Superior Equipment will not be responsible for any damage or injury/loss of life from failure to lift units in proper manner.

Bell & Gossett
a xylem brand

PERFORMANCE CURVE

Quote Number: 9003-160412-012:2
Model: VIT-FFFM
Size: 20RCHC 2 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	86.90 %
Speed:	1180	Flow at BEP:	226.00 LitersPerSecond
Impeller Trim:	393.9997 mm	Min Flow:	56.60 LitersPerSecond
Frequency:	60 Hz	Derate Factor:	0.0000
Additional Impeller Trim:	394.005 mm	NPSH Required:	7.86 m
Impeller Maximum Trim:	396.9995 mm	Specified NPSH Avail:	10.36 m
Specified Flow:	300.00 LitersPerSecond	Shut-Off Head:	77.90 m
Specified Head:	46.00 m	Fluid Type:	Water
Head at Design:	46.50 m	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	80.40 %	Viscosity:	0.9695 cP
Power at Design:	169.00 kW	Allowable Sphere Size:	39.62 mm
Flow on Design Trim at Max Power:	298 LitersPerSecond	Thrust K Factor:	23.9900 lbs/ft
Max Power on Design Curve:	169.00 kW	Additional Thrust K Factor:	23.9900 lbs/ft
Run-Out Flow:	0.00 LitersPerSecond	Max Lateral:	28.45 mm
Run-Out Head:	0 m		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag	

APPENDIX C

Existing PRV's Set Point and Calibration Letter

Select Engineering Consultants Ltd.

Suite 100, 17413 – 107 Avenue NW, Edmonton AB T5S 1E5
T: 780 651 5777 F: 780 651 5757 **selecteng.ca**

September 11, 2019

File No.: 02-190730-2.2

City of Spruce Grove
Attention: Trevor Crawford
315 Jespersen Ave
Spruce Grove, AB
T7X 3E8

Dear Darcy,

Re: City of Spruce Grove
Existing PRV's new Set-points and Calibration

1.0 General Information

As per City's request and approval, on September 11, 2019 the existing five PRV's within the City of Spruce Grove water system were re-set and calibrated. The new setting points were based on the City of Spruce Grove request to maintain a minimum of 350 kPa (50 psi) everywhere within the Zone 2 water system.

The PRV's resetting and calibration was completed by Xpert Valve Service & Maintenance Ltd and is summarized below:

Date: September 11, 2019
Participants:

- Xpert Valve Service & Maintenance Ltd.: Field representative: Navin Chand (navinchand@live.com)
- City of Spruce Grove: - Paul Chouinard – Publick Works
  - Braden Bruce – Public Works
- Select Engineering Consultants: Floarea Zerfass, P.Eng.

2.0 Existing PRV's Assessment

Figure 3.1 illustrates the existing PRV's location. The following is a description of the existing PRV's conditions:

1.0 – King Street PRV

The PRV chamber was de-watered on the morning of September 11. The City Staff confirmed that prior to arriving at this site, the PRV's chamber was 75% full of water. There was still approximately 200 mm depth of water within this chamber at the time of the PRV resetting work.

The chamber is completed with a hydraulic sump pump. However, the sump pump discharge is not connected to the existing storm system.

2.0 – Berkley PRV

The PRV chamber is completed with a sump pump connected to an existing catch basin located in the vicinity of the PRV. Therefore no de-watering was required for this location.

3.0 – Lakeland PRV

Similar to Berkeley PRV, The PRV chamber is completed with a sump pump connected to an existing catch basin located in the vicinity of the PRV. Therefore no de-watering was required for this location.

4.0 – Spruce Ridge PRV

The PRV chamber was de-watered on the morning of September 11. The City Staff confirmed that prior to arriving at this site, the PRV's chamber was 80% full of water.
This PRV chamber is not completed with sump pump due to the non-existence of a storm system within this area.

The following table is a summary of the existing PRV'S set points as recorded on September 11, 2019:

Table 1: Existing PRV's settings as recorded on September 11, 2019

PRV Location	Existing Elevation	Upstream		Downstream	
	m	psi	kPa	psi	kPa
King Street	690.68	98	676	70	483
Berkeley Street	696.83	90	621	68	469
Lakeland	697.07	90	621	64	441
Spruce Ridge	696.12	90	621	68	469
North Pump House	693.87	90	621	68	469

The set point (HGL) of the existing PRV's was determined based on the City of Spruce Grove requirements as follows:

- Maximum system Pressure = 700 kPa (100 psi)
- Minimum system Pressure = 350 kPa (50 psi)

Based on the above criteria, the PRV's HGL were assessed to maintain a minimum of 350 kPa (50 psi) at the existing highest ground elevation within Zone 2 water system.

The highest ground elevation in Zone 2 was identified in Greystone subdivision, located north of Grove Meadow Drive and east of Century Road. Based on the existing ground elevation within this subdivision, the required HGL within Zone 2 is summarized in the following table:

Table 2.0: Existing PRV's – Proposed HGL

Highest Ground Subdivision	Elevation m	Minimum Pressure		Proposed HGL m
		psi	kPa	
Greystone Subdivision	700.3	50	350	**735.50**

The above table indicates that the required operating pressure within Zone 2 is determined by the proposed Hydraulic Grade Line of 735.50m.

Based on the above assessment the existing PRV's were set to the following downstream set point:

Table 2: Existing PRV's new settings

PRV Location	Hydraulic Grade Line	Downstream (Main Line-High Flow)		Downstream (Bypass-Low Flow)	
	m	psi	kPa	psi	kPa
King Street	735.50	60	414	64	441
Berkeley Street	735.50	50	345	55	379
Lakeland	735.50	50	345	55	379
Spruce Ridge	735.50	51	352	56	386
North Pump House	735.50	59	407	No Bypass line	

If you have any questions or require additional information, please contact the undersigned at 780-651-5758.

Sincerely,

Select Engineering Consultants

Floarea Zerfass, P. Eng.
Project Engineer
fzerfass@selecteng.ca

FZ/

cc: Trevor Crawford (tcrawford@sprucegrove.org): City of Spruce Grove
Steve Brittain (sbrittain@selecteng.ca): SEC

FILENAME: 02-13034-F3.1.DWG SOURCE: W:\02-SPRUCE GROVE\02-13034-WATER NETWORK ANALYSIS UPDATE\3.0 DESIGN PROCESS\3.3 ACAD\3.3.3 WORKING DRAWINGS

HIGHWAY 16

HIGHWAY 16

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

GROVE DRIVE

GROVE DRIVE

PUMP HOUSE 2

PRV-5

XFCV

PRESSURE ZONE 2

SPRUCE RIDGE DRIVE

PRV-1

GROVE DRIVE

MEADOW DRIVE

PRV-2

KING STREET

BERKLEY STREET

PRV-3

PRV-4

GREYSTONE DRIVE

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 1

McLEOD AVENUE

HIGHWAY 16A

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

CANADIAN NATIONAL RAILWAY

SOUTH AVENUE

PUMP HOUSE 1

DIAMOND AVENUE

LEGEND

- PRESSURE ZONE BOUNDARY
- STUDY AREA BOUNDARY
- CITY CORPORATE LIMITS
- PRESSURE REDUCE VALVE, PRV
- FLOW CONTROL VALVE, FCV
- 100mm WATERMAIN
- 150mm WATERMAIN
- 200mm WATERMAIN
- 250mm WATERMAIN
- 300mm WATERMAIN
- 350mm WATERMAIN
- 400mm WATERMAIN
- 450mm WATERMAIN
- 500mm WATERMAIN
- 600mm WATERMAIN
- 750mm WATERMAIN

CITY OF SPRUCE GROVE
WATER MASTER PLAN UPDATE
EXISTING WATER SYSTEM

SAVED BY: KDANIELS PLOT DATE: November 2, 2015

m
0 200 400 600

SCALE 1:20 000

FIGURE 3.1

APPENDIX D

Hydrant Flow Test Field Data

Hydrant Flow Test - Fire Flows

Job Number: 02-21089
Neighburhood: City of Spruce Grove
Stage:
Date: 13-Apr-21
Attendance: Ross Curtis - N.S. Pawliuk
Blair Brandenburg - City of Spruce Grove
Floarea Zerfass - SEC

Required Fire Flow: 100 to 300 L/s
100 1585.03231 gal/min
300 4755.09693 gal/min
1 0.063090197 L/s

Minimum Residual Pressure: 20.3 psi
kPa = 20.31 psi
psi = 6.89 kpa

Table 1.0

Hydrant Flow Test - April 13, 2021

Item No.	Hyd Description	Location	No. of open ports	Field Pressure		Field Flow, Qf		Equivalent Flow at residual pressure = 20 psi, Qr	
				Static Pressure, Ps	Residual Pressure, Pr				
				psi	psi	gpm	l/s	gpm	l/s
1	H-00270	Diamond Ave	1	79	65	780	49.21	1696.1	107.01
2	H-00320	South Ave	1	74	63	764	48.20	1804.0	113.81
3	H-00521	Church Road	1	74	63	748	47.19	1766.2	111.43
4	H-00234	McLoud Ave	1	84	75	811	51.17	2339.2	147.58
5	H-00183	Greystone Goebel Dr	1	50	42	680	42.90	1388.3	87.59
6	H-00836	Tonewood	1	78	64	854	53.88	1839.9	116.08
7	H-01073	West Wind	1	80	64	854	53.88	1743.6	110.00
8	H-00227	Linksview Dr.	1	84	78	882	55.65	3166.7	199.79
9	H-00254	Millgrove Dr	1	70	62	732	46.18	1969.2	124.24
10	H-00877	Harvest Ridge Dr	1	66	62	732	46.18	2737.1	172.68

* - Qr = Qf((Hr)^0.54/(Hf)^0.54)

where:

Qr = flow available at the desired residual pressure (20 psi)
Qf = flow during test
Hr = pressure drop to the desired residual pressure
Hr = (Ps- 20)^0.54
Hf = pressure drop during test
Hf = (Ps- Pr)^0.54
Ps = Static Pressure
Pr = Residual Pressure

FILENAME: 02-13034-F3.1.DWG SOURCE: W:\02-SPRUCE GROVE\02-13034-WATER NETWORK ANALYSIS UPDATE\3.0 DESIGN PROCESS\3.3 ACAD\3.3.3 WORKING DRAWINGS

HIGHWAY 16

HIGHWAY 16

JENNIFER HEIL WAY

CALAHOO ROAD

CENTURY ROAD

PIONEER ROAD

GROVE DRIVE

GROVE DRIVE

PUMP HOUSE 2

PRV-5

FCV

PRESSURE ZONE 2

SPRUCE RIDGE DRIVE

PRV-1

GROVE

MEADOW DRIVE

PRV-2

KING STREET

BERKLEY STREET

PRV-3

PRV-4

GREYSTONE DRIVE

PRESSURE ZONE 2

PRESSURE ZONE 1

PRESSURE ZONE 1

McLEOD AVENUE

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

SOUTH AVENUE

PUMP HOUSE 1

DIAMOND AVENUE

HIGHWAY 16A

CANADIAN NATIONAL RAILWAY

H-00227

H-01073 Westwind Dr

H-00836

H-00677

H-00254

H-00183

H-00521

H-00254

H-00320

H-00270

N

SAVED BY: KDANIELS PLOT DATE: March 19, 2021

sec

0 200 400 600 m

SCALE 1:20 000

LEGEND

- PRESSURE ZONE BOUNDARY
- STUDY AREA BOUNDARY
- CITY CORPORATE LIMITS
- PRESSURE REDUCE VALVE, PRV
- FLOW CONTROL VALVE, FCV
- 100mm WATERMAIN
- 150mm WATERMAIN
- 200mm WATERMAIN
- 250mm WATERMAIN
- 300mm WATERMAIN
- 350mm WATERMAIN
- 400mm WATERMAIN
- 450mm WATERMAIN
- 500mm WATERMAIN
- 600mm WATERMAIN
- 750mm WATERMAIN

CITY OF SPRUCE GROVE
WATER MASTER PLAN UPDATE
EXISTING WATER SYSTEM

PROPOSED HYDRANT FLOW TEST MAP

MARCH 20, 2021

FIGURE 3.1

APPENDIX E

Average Day Demand - 2020

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
2781	J-1-1	710.78	Zone-1	0.000	756.41	447
2893	J-1-10	692.50	Zone-1	0.000	755.92	621
323	J-1-100	700.00	Zone-1	0.000	756.18	550
331	J-1-101	695.60	Zone-1	0.258	756.18	593
326	J-1-102	698.50	Zone-1	0.106	756.16	564
327	J-1-103	700.17	Zone-1	0.439	756.16	548
3030	J-1-104	701.02	Zone-1	0.000	756.16	540
3032	J-1-105	701.76	Zone-1	0.000	756.16	532
328	J-1-106	701.60	Zone-1	0.000	756.16	534
310	J-1-107	701.80	Zone-1	0.000	756.21	532
253	J-1-108	704.24	Zone-1	0.272	756.20	509
254	J-1-109	706.00	Zone-1	0.076	756.20	491
2709	J-1-11	707.80	Zone-1	0.000	756.31	475
256	J-1-110	705.20	Zone-1	0.000	756.19	499
255	J-1-111	705.90	Zone-1	0.295	756.19	492
252	J-1-112	706.25	Zone-1	0.174	756.19	489
423	J-1-113	705.46	Zone-1	0.227	756.20	497
424	J-1-114	706.30	Zone-1	0.220	756.19	488
263	J-1-115	704.15	Zone-1	0.212	756.19	509
434	J-1-116	701.65	Zone-1	0.242	756.19	534
262	J-1-117	697.35	Zone-1	0.159	756.19	576
265	J-1-118	698.57	Zone-1	0.234	756.19	564
425	J-1-119	701.80	Zone-1	0.197	756.19	532
2713	J-1-12	708.40	Zone-1	0.000	756.31	469
435	J-1-120	702.40	Zone-1	0.114	756.19	526
264	J-1-121	700.70	Zone-1	0.182	756.19	543
267	J-1-122	702.40	Zone-1	0.000	756.19	526
266	J-1-123	702.35	Zone-1	0.000	756.19	527
251	J-1-124	705.41	Zone-1	0.000	756.19	497
257	J-1-125	704.75	Zone-1	0.189	756.19	503
258	J-1-126	704.00	Zone-1	0.000	756.19	511
259	J-1-127	701.25	Zone-1	0.137	756.18	538
260	J-1-128	699.65	Zone-1	0.000	756.19	553
261	J-1-129	698.54	Zone-1	0.326	756.19	564
2711	J-1-13	707.50	Zone-1	0.000	756.31	478
426	J-1-130	698.75	Zone-1	0.000	756.19	562
268	J-1-131	700.95	Zone-1	0.189	756.18	541
269	J-1-132	700.10	Zone-1	0.182	756.17	549
427	J-1-132	701.30	Zone-1	0.000	756.18	537
270	J-1-133	700.03	Zone-1	0.000	756.17	549
250	J-1-134	707.00	Zone-1	0.000	756.20	482
248	J-1-135	705.60	Zone-1	0.000	756.21	495
246	J-1-136	705.00	Zone-1	0.000	756.22	501
438	J-1-137	705.90	Zone-1	0.000	756.23	493
241	J-1-138	708.50	Zone-1	0.733	756.25	467
242	J-1-139	708.35	Zone-1	0.000	756.24	469

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
412	J-1-14	711.50	Zone-1	0.403	756.29	438
243	J-1-140	708.05	Zone-1	0.379	756.19	471
3024	J-1-142	707.08	Zone-1	0.000	756.17	480
408	J-1-143	708.70	Zone-1	0.000	756.17	465
407	J-1-144	709.70	Zone-1	0.000	756.19	455
301	J-1-145	708.23	Zone-1	0.598	756.15	469
302	J-1-146	706.28	Zone-1	0.000	756.17	488
303	J-1-147	706.37	Zone-1	0.345	756.17	487
442	J-1-148	705.19	Zone-1	0.000	756.17	499
278	J-1-149	705.90	Zone-1	0.400	756.17	492
342	J-1-15	712.40	Zone-1	0.403	756.30	430
244	J-1-150	706.71	Zone-1	0.364	756.18	484
245	J-1-151	705.85	Zone-1	0.000	756.19	493
283	J-1-152	704.63	Zone-1	1.124	756.18	504
277	J-1-153	704.10	Zone-1	0.360	756.17	510
280	J-1-154	704.82	Zone-1	0.430	756.17	503
444	J-1-155	704.70	Zone-1	0.000	756.15	504
446	J-1-156	705.00	Zone-1	0.000	756.12	500
299	J-1-157	705.86	Zone-1	0.385	756.11	492
298	J-1-158	706.53	Zone-1	0.678	756.09	485
443	J-1-159	707.10	Zone-1	0.000	756.11	480
341	J-1-16	712.10	Zone-1	0.403	756.30	433
300	J-1-160	708.50	Zone-1	0.000	756.11	466
285	J-1-161	705.30	Zone-1	0.385	756.16	498
397	J-1-161	707.40	Zone-1	0.000	756.10	477
276	J-1-162	702.69	Zone-1	0.000	756.17	523
282	J-1-163	704.25	Zone-1	0.151	756.17	508
284	J-1-164	704.25	Zone-1	0.430	756.17	508
271	J-1-165	701.80	Zone-1	0.601	756.17	532
272	J-1-166	698.80	Zone-1	0.332	756.16	561
273	J-1-167	699.60	Zone-1	0.221	756.16	554
274	J-1-168	700.40	Zone-1	0.364	756.16	546
275	J-1-169	700.30	Zone-1	0.478	756.16	547
345	J-1-17	710.50	Zone-1	0.403	756.30	448
286	J-1-170	705.37	Zone-1	0.402	756.16	497
287	J-1-171	701.77	Zone-1	0.360	756.16	532
3717	J-1-172	700.49	Zone-1	0.000	756.14	545
3721	J-1-173	696.90	Zone-1	0.000	756.12	580
474	J-1-174	699.50	Zone-1	0.522	756.10	554
288	J-1-175	701.40	Zone-1	0.126	756.09	535
2935	J-1-176	703.83	Zone-1	0.000	756.09	512
2932	J-1-177	699.44	Zone-1	0.000	756.09	554
410	J-1-178	697.90	Zone-1	0.104	756.09	569
304	J-1-179	698.70	Zone-1	0.000	756.15	562
346	J-1-18	709.30	Zone-1	0.806	756.30	460
305	J-1-180	698.46	Zone-1	0.000	756.15	565

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
307	J-1-181	698.30	Zone-1	0.000	756.15	566
306	J-1-182	697.89	Zone-1	0.000	756.15	570
309	J-1-183	698.00	Zone-1	1.072	756.15	569
308	J-1-184	695.00	Zone-1	0.000	756.11	598
2386	J-1-185	701.16	Zone-1	0.000	756.07	537
289	J-1-186	700.10	Zone-1	0.000	756.08	548
296	J-1-187	705.89	Zone-1	0.000	756.09	491
439	J-1-188	706.53	Zone-1	0.000	756.09	485
297	J-1-189	706.53	Zone-1	0.000	756.09	485
2130	J-1-19	709.00	Zone-1	0.403	756.31	463
295	J-1-190	707.00	Zone-1	0.000	756.08	480
413	J-1-191	705.31	Zone-1	0.000	756.08	497
294	J-1-192	704.70	Zone-1	0.000	756.08	503
293	J-1-193	702.72	Zone-1	0.000	756.08	522
432	J-1-194	702.10	Zone-1	0.000	756.08	528
292	J-1-195	700.60	Zone-1	0.000	756.08	543
290	J-1-196	698.20	Zone-1	0.000	756.08	566
401	J-1-197	700.03	Zone-1	0.000	756.07	548
400	J-1-198	700.00	Zone-1	0.182	756.05	549
402	J-1-199	700.90	Zone-1	0.000	756.05	540
447	J-1-2	709.00	Zone-1	0.000	756.38	464
403	J-1-200	701.51	Zone-1	0.000	756.05	534
399	J-1-201	699.94	Zone-1	0.000	756.04	549
398	J-1-202	700.86	Zone-1	0.000	756.03	540
404	J-1-203	702.39	Zone-1	0.485	756.03	525
429	J-1-204	704.20	Zone-1	0.000	756.03	507
405	J-1-205	705.75	Zone-1	0.227	756.03	492
393	J-1-206	704.10	Zone-1	0.000	756.03	508
396	J-1-207	705.50	Zone-1	0.000	756.08	495
395	J-1-208	705.10	Zone-1	0.000	756.06	499
394	J-1-209	704.60	Zone-1	0.000	756.03	503
485	J-1-21	708.96	Zone-1	0.000	756.31	463
361	J-1-210	704.50	Zone-1	0.000	756.02	504
366	J-1-211	703.30	Zone-1	0.000	756.01	516
384	J-1-212	703.50	Zone-1	0.000	756.01	514
383	J-1-213	703.00	Zone-1	0.000	756.01	519
367	J-1-214	703.23	Zone-1	0.000	756.01	517
387	J-1-215	702.50	Zone-1	0.151	756.02	524
391	J-1-216	702.30	Zone-1	0.000	756.02	526
390	J-1-217	701.50	Zone-1	0.258	756.03	534
389	J-1-218	699.60	Zone-1	0.204	756.02	552
428	J-1-219	696.80	Zone-1	0.000	756.02	580
480	J-1-22	709.88	Zone-1	0.000	756.32	454
388	J-1-220	700.25	Zone-1	0.212	756.02	546
368	J-1-221	700.51	Zone-1	0.121	756.00	543
371	J-1-222	698.22	Zone-1	0.151	756.00	565

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
372	J-1-223	698.70	Zone-1	0.000	756.00	561
431	J-1-224	696.77	Zone-1	0.099	756.00	580
370	J-1-225	697.57	Zone-1	0.106	756.00	572
373	J-1-226	696.70	Zone-1	0.000	756.00	580
369	J-1-227	696.99	Zone-1	0.000	756.00	577
374	J-1-228	697.42	Zone-1	0.083	756.00	573
386	J-1-229	697.60	Zone-1	0.000	756.00	572
2137	J-1-23	708.17	Zone-1	0.000	756.32	471
385	J-1-230	699.30	Zone-1	0.000	756.00	555
375	J-1-231	698.87	Zone-1	0.000	756.00	559
376	J-1-232	702.40	Zone-1	0.227	756.00	525
377	J-1-233	702.50	Zone-1	0.174	756.00	524
381	J-1-234	703.70	Zone-1	0.000	756.00	512
378	J-1-235	701.50	Zone-1	0.204	756.00	533
380	J-1-236	701.20	Zone-1	0.000	756.00	536
379	J-1-237	702.10	Zone-1	0.000	756.00	528
359	J-1-238	702.50	Zone-1	0.000	756.00	524
360	J-1-239	704.30	Zone-1	0.000	756.01	506
2135	J-1-24	708.54	Zone-1	0.403	756.31	468
357	J-1-240	703.30	Zone-1	0.000	756.01	516
358	J-1-241	703.30	Zone-1	0.000	756.01	516
356	J-1-242	705.00	Zone-1	0.000	756.02	499
353	J-1-243	705.70	Zone-1	0.403	756.04	493
354	J-1-244	706.70	Zone-1	0.403	756.13	484
355	J-1-245	707.10	Zone-1	0.403	756.16	480
2390	J-1-246	708.00	Zone-1	0.000	756.17	471
351	J-1-247	703.75	Zone-1	0.403	756.04	512
350	J-1-248	703.90	Zone-1	0.403	756.05	510
436	J-1-249	705.30	Zone-1	0.403	756.05	497
3710	J-1-25	709.40	Zone-1	0.000	756.31	459
411	J-1-250	702.80	Zone-1	0.403	756.04	521
352	J-1-251	705.65	Zone-1	0.403	756.03	493
448	J-1-252	705.00	Zone-1	0.000	756.03	499
451	J-1-253	705.00	Zone-1	0.403	756.03	499
450	J-1-254	705.00	Zone-1	0.403	756.03	499
449	J-1-255	705.00	Zone-1	0.403	756.03	499
452	J-1-256	705.00	Zone-1	0.403	756.03	499
453	J-1-257	705.00	Zone-1	0.403	756.02	499
456	J-1-258	705.00	Zone-1	0.000	756.01	499
364	J-1-259	704.31	Zone-1	0.000	755.99	506
3708	J-1-26	709.50	Zone-1	0.000	756.31	458
363	J-1-260	704.00	Zone-1	0.000	755.98	509
362	J-1-261	701.75	Zone-1	0.000	755.98	531
2106	J-1-262	701.78	Zone-1	0.000	755.98	530
365	J-1-263	700.00	Zone-1	0.000	755.98	548
459	J-1-264	698.25	Zone-1	0.000	755.95	565

City of Spuce Grove Water System
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Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
920	J-1-266	698.29	Zone-1	0.000	755.95	564
918	J-1-267	696.65	Zone-1	0.000	755.95	580
2072	J-1-268	698.29	Zone-1	0.000	755.95	564
2067	J-1-269	698.13	Zone-1	0.000	755.95	566
2139	J-1-27	709.27	Zone-1	0.000	756.34	461
917	J-1-270	696.76	Zone-1	0.000	755.95	579
2069	J-1-271	696.95	Zone-1	0.000	755.95	577
915	J-1-272	695.00	Zone-1	0.000	755.95	597
462	J-1-273	694.94	Zone-1	0.000	755.95	597
512	J-1-274	692.00	Zone-1	0.000	755.93	626
2080	J-1-275	693.53	Zone-1	0.000	755.95	611
2092	J-1-276	694.01	Zone-1	0.000	755.96	606
2095	J-1-277	693.00	Zone-1	0.310	755.96	616
2101	J-1-278	694.20	Zone-1	0.000	755.96	604
2103	J-1-279	694.00	Zone-1	0.000	755.96	606
2141	J-1-28	713.00	Zone-1	0.000	756.37	424
2099	J-1-280	695.00	Zone-1	0.000	755.96	597
2097	J-1-281	694.50	Zone-1	0.439	755.96	602
2583	J-1-282	694.94	Zone-1	0.061	755.96	597
2110	J-1-283	695.43	Zone-1	0.258	755.97	592
2113	J-1-284	693.50	Zone-1	0.000	755.97	611
2115	J-1-285	693.30	Zone-1	0.000	755.97	613
2117	J-1-286	696.05	Zone-1	0.258	755.97	586
2586	J-1-287	692.20	Zone-1	0.068	755.96	624
3092	J-1-288	690.20	Zone-1	0.076	755.96	644
409	J-1-29	713.40	Zone-1	0.403	756.38	421
2592	J-1-290	687.40	Zone-1	0.355	755.95	671
919	J-1-291	697.00	Zone-1	0.000	755.95	577
916	J-1-292	696.46	Zone-1	0.000	755.95	582
2083	J-1-295	690.00	Zone-1	0.469	755.95	645
2089	J-1-296	690.00	Zone-1	0.000	755.95	645
2087	J-1-297	689.70	Zone-1	0.409	755.95	648
2085	J-1-298	690.15	Zone-1	0.000	755.95	644
3211	J-1-299	688.45	Zone-1	0.000	755.95	661
2812	J-1-3	708.56	Zone-1	0.000	756.31	467
3705	J-1-30	712.31	Zone-1	0.000	756.38	431
3213	J-1-300	688.10	Zone-1	0.000	755.95	664
2577	J-1-301	689.55	Zone-1	0.355	755.94	650
2581	J-1-302	689.75	Zone-1	0.000	755.94	648
2579	J-1-303	688.40	Zone-1	0.000	755.94	661
440	J-1-304	690.70	Zone-1	0.000	755.93	638
2056	J-1-305	691.00	Zone-1	0.000	755.87	635
2058	J-1-306	691.00	Zone-1	0.000	755.81	634
2060	J-1-307	691.50	Zone-1	0.000	755.73	629
454	J-1-308	705.00	Zone-1	0.403	756.05	500
455	J-1-309	703.40	Zone-1	0.000	756.09	516

City of Spuce Grove Water System
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ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
339	J-1-31	714.40	Zone-1	0.403	756.40	411
421	J-1-310	702.50	Zone-1	0.403	756.09	525
349	J-1-311	703.75	Zone-1	0.403	756.10	512
347	J-1-312	703.60	Zone-1	0.403	756.19	515
420	J-1-313	701.69	Zone-1	0.403	756.19	533
348	J-1-314	702.95	Zone-1	0.403	756.13	520
2121	J-1-315	702.06	Zone-1	0.000	756.24	530
2122	J-1-316	702.62	Zone-1	0.000	756.26	525
2133	J-1-317	703.48	Zone-1	0.000	756.26	517
473	J-1-32	711.71	Zone-1	0.403	756.33	437
2124	J-1-320	703.24	Zone-1	0.403	756.28	519
2126	J-1-321	703.12	Zone-1	0.403	756.29	520
344	J-1-322	705.00	Zone-1	0.403	756.25	502
2128	J-1-323	706.83	Zone-1	0.403	756.30	484
486	J-1-325	707.14	Zone-1	0.000	756.31	481
422	J-1-326	709.50	Zone-1	0.403	756.28	458
247	J-1-327	704.50	Zone-1	0.076	756.21	506
249	J-1-328	705.50	Zone-1	0.091	756.20	496
279	J-1-329	705.10	Zone-1	0.000	756.17	500
482	J-1-32a	715.56	Zone-1	0.000	756.33	399
476	J-1-33	713.23	Zone-1	0.000	756.33	422
281	J-1-330	704.63	Zone-1	0.099	756.17	504
382	J-1-331	702.50	Zone-1	0.121	756.01	524
392	J-1-332	703.10	Zone-1	0.076	756.03	518
406	J-1-333	703.75	Zone-1	0.000	756.03	512
430	J-1-334	703.20	Zone-1	0.288	756.03	517
437	J-1-335	705.19	Zone-1	0.478	756.17	499
338	J-1-35	709.60	Zone-1	0.403	756.33	457
337	J-1-37	713.90	Zone-1	0.403	756.37	416
340	J-1-38	714.40	Zone-1	0.403	756.35	411
3453	J-1-39	713.00	Zone-1	0.000	756.35	424
533	J-1-4	708.00	Zone-1	0.000	756.20	472
343	J-1-40	711.50	Zone-1	0.403	756.35	439
240	J-1-41	711.50	Zone-1	0.000	756.38	439
441	J-1-41	707.87	Zone-1	0.931	756.17	473
417	J-1-42	713.00	Zone-1	0.000	756.38	425
418	J-1-43	713.00	Zone-1	0.000	756.38	425
414	J-1-44	712.20	Zone-1	0.000	756.38	432
336	J-1-46	712.60	Zone-1	0.000	756.38	428
335	J-1-47	711.00	Zone-1	0.403	756.36	444
334	J-1-48	708.60	Zone-1	0.403	756.31	467
415	J-1-49	706.10	Zone-1	0.403	756.24	491
536	J-1-5	708.23	Zone-1	0.000	756.17	469
3396	J-1-50	704.66	Zone-1	0.000	756.23	505
3399	J-1-51	698.00	Zone-1	0.000	756.23	570
3401	J-1-52	698.00	Zone-1	0.000	756.23	570

City of Spuce Grove Water System
FlexTable: Junction Table
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ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3403	J-1-53	696.00	Zone-1	0.000	756.23	589
333	J-1-56	702.80	Zone-1	0.000	756.21	523
461	J-1-57	702.00	Zone-1	0.000	756.21	531
2351	J-1-58	702.00	Zone-1	0.000	756.20	530
311	J-1-59	700.91	Zone-1	0.159	756.20	541
535	J-1-6	707.50	Zone-1	0.000	756.15	476
312	J-1-60	696.50	Zone-1	0.000	756.19	584
2354	J-1-61	696.90	Zone-1	0.000	756.20	580
526	J-1-62	696.00	Zone-1	0.000	756.19	589
921	J-1-7	706.00	Zone-1	0.000	756.12	490
320	J-1-75	701.15	Zone-1	0.182	756.20	539
318	J-1-76	701.19	Zone-1	0.099	756.19	538
319	J-1-77	701.79	Zone-1	0.114	756.19	532
419	J-1-78	701.56	Zone-1	0.000	756.19	535
317	J-1-79	701.08	Zone-1	0.220	756.19	539
534	J-1-8	701.40	Zone-1	1.243	756.07	535
316	J-1-80	696.70	Zone-1	0.288	756.18	582
315	J-1-81	695.30	Zone-1	0.166	756.18	596
314	J-1-82	695.69	Zone-1	0.197	756.18	592
313	J-1-83	696.25	Zone-1	0.000	756.19	587
433	J-1-84	698.40	Zone-1	0.000	756.19	566
525	J-1-85	695.70	Zone-1	0.378	756.18	592
524	J-1-86	694.60	Zone-1	0.128	756.18	603
529	J-1-87	695.30	Zone-1	0.000	756.18	596
522	J-1-88	694.83	Zone-1	0.250	756.18	600
523	J-1-89	695.78	Zone-1	0.106	756.18	591
923	J-1-9	697.90	Zone-1	0.000	756.05	569
527	J-1-90	695.35	Zone-1	0.462	756.18	595
528	J-1-91	694.60	Zone-1	0.000	756.18	603
530	J-1-92	694.65	Zone-1	0.288	756.18	602
531	J-1-93	696.30	Zone-1	0.182	756.18	586
2693	J-1-94	695.00	Zone-1	0.000	756.18	599
445	J-1-95	695.00	Zone-1	0.272	756.18	599
330	J-1-96	696.80	Zone-1	0.000	756.17	581
324	J-1-97	699.60	Zone-1	0.121	756.17	554
325	J-1-98	700.50	Zone-1	0.000	756.17	545
322	J-1-99	698.35	Zone-1	0.000	756.18	566
3748	J-56	695.10	Zone-1	0.000	756.18	598
3751	J-57	695.10	Zone-1	0.000	756.18	598
3754	J-58	694.60	Zone-1	0.000	756.18	603
3757	J-59	694.92	Zone-1	0.000	756.18	600
3760	J-60	694.45	Zone-1	0.000	756.18	604
3763	J-61	696.30	Zone-1	0.000	756.18	586
3910	J-119	712.61	Zone-1	0.000	756.33	428
4257	J-237	705.00	Zone-1	0.000	756.04	500
4398	J-249	707.70	<None>	0.000	756.25	475

City of Spuce Grove Water System

FlexTable: Junction Table

Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
685	J-2-1	692.50	Zone-2	0.000	732.01	387
716	J-2-10	689.00	Zone-2	0.000	732.01	421
611	J-2-100	694.34	Zone-2	0.000	731.98	368
668	J-2-101	691.89	Zone-2	0.295	731.98	392
579	J-2-102	694.76	Zone-2	0.166	731.98	364
689	J-2-103	690.90	Zone-2	0.151	731.98	402
658	J-2-104	695.13	Zone-2	0.318	731.98	361
736	J-2-105	693.81	Zone-2	0.000	731.98	374
553	J-2-106	695.70	Zone-2	0.204	731.99	355
703	J-2-107	696.00	Zone-2	0.258	731.99	352
3610	J-2-108	695.90	Zone-2	0.000	731.99	353
793	J-2-109	695.53	Zone-2	0.000	731.99	357
773	J-2-11	685.90	Zone-2	0.000	732.01	451
748	J-2-110	695.18	Zone-2	0.000	731.99	360
549	J-2-111	696.42	Zone-2	0.174	732.00	348
3198	J-2-112	690.20	Zone-2	0.000	731.98	409
3203	J-2-113	686.58	Zone-2	0.000	731.98	444
3201	J-2-114	687.00	Zone-2	0.000	731.97	440
3196	J-2-115	690.50	Zone-2	0.000	731.98	406
3194	J-2-116	688.25	Zone-2	0.000	731.97	428
3086	J-2-117	689.28	Zone-2	0.000	731.97	418
842	J-2-118	688.85	Zone-2	0.000	731.97	422
2679	J-2-119	687.41	Zone-2	0.000	731.97	436
786	J-2-12	685.37	Zone-2	0.378	732.01	456
2684	J-2-120	689.20	Zone-2	0.000	731.97	419
2800	J-2-123	691.00	Zone-2	0.000	731.97	401
856	J-2-126	685.22	Zone-2	0.000	731.96	457
2610	J-2-127	685.10	Zone-2	0.000	731.96	459
2617	J-2-128	685.58	Zone-2	0.159	731.96	454
3208	J-2-129	686.72	Zone-2	0.099	731.96	443
772	J-2-13	684.40	Zone-2	0.128	732.01	466
3206	J-2-130	686.70	Zone-2	0.053	731.96	443
2619	J-2-131	685.37	Zone-2	0.197	731.96	456
2869	J-2-133	687.53	Zone-2	0.272	731.96	435
2871	J-2-134F	686.46	Zone-2	0.000	731.96	445
616	J-2-14	687.00	Zone-2	0.000	732.01	440
599	J-2-15	687.50	Zone-2	0.000	732.01	436
2520	J-2-150	683.02	Zone-2	0.000	731.96	479
853	J-2-151	683.76	Zone-2	2.080	731.96	472
3633	J-2-152	680.27	Zone-2	0.000	731.96	506
3638	J-2-153	679.12	Zone-2	0.000	731.96	517
3641	J-2-154	678.44	Zone-2	0.000	731.96	524
3643	J-2-155	677.55	Zone-2	0.000	731.96	533
3645	J-2-156	677.53	Zone-2	0.000	731.96	533
3647	J-2-157	677.43	Zone-2	0.000	731.96	534
3629	J-2-158	677.47	Zone-2	0.000	731.96	533

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3627	J-2-159	678.29	Zone-2	0.000	731.96	525
619	J-2-16	693.00	Zone-2	0.386	732.01	382
3625	J-2-160	677.29	Zone-2	0.000	731.96	535
3622	J-2-161	677.25	Zone-2	0.000	731.96	535
2488	J-2-162	677.06	Zone-2	0.000	731.96	537
2514	J-2-163	677.02	Zone-2	0.220	731.96	538
843	J-2-165	679.50	Zone-2	0.000	731.97	513
2343	J-2-166	680.00	Zone-2	0.000	731.97	509
2345	J-2-167	684.89	Zone-2	0.000	731.96	461
2511	J-2-168	686.00	Zone-2	0.000	731.96	450
2509	J-2-169	682.80	Zone-2	0.409	731.96	481
676	J-2-17	694.00	Zone-2	0.000	732.01	372
2505	J-2-170	681.56	Zone-2	0.000	731.96	493
2503	J-2-171	681.97	Zone-2	0.409	731.96	489
2501	J-2-172	682.92	Zone-2	0.439	731.96	480
2480	J-2-173	679.36	Zone-2	0.386	731.96	515
3742	J-2-173A	680.19	Zone-2	0.000	731.96	507
3618	J-2-174	680.02	Zone-2	0.000	731.96	508
2498	J-2-175	679.19	Zone-2	0.485	731.96	516
3613	J-2-176	677.42	Zone-2	0.000	731.96	534
3616	J-2-177	678.17	Zone-2	0.000	731.96	526
2482	J-2-178	677.17	Zone-2	0.393	731.96	536
2484	J-2-179	676.62	Zone-2	0.045	731.96	542
2492	J-2-179A	677.97	Zone-2	0.515	731.96	528
713	J-2-18	694.50	Zone-2	0.000	732.01	367
2495	J-2-180	677.04	Zone-2	0.182	731.96	538
852	J-2-181	677.05	Zone-2	0.159	731.96	537
3651	J-2-182	675.35	Zone-2	0.000	731.96	554
3653	J-2-183	675.23	Zone-2	0.000	731.96	555
3655	J-2-184	675.23	Zone-2	0.000	731.96	555
922	J-2-185	675.20	Zone-2	0.348	731.96	556
3657	J-2-186	675.14	Zone-2	0.000	731.96	556
3659	J-2-187	674.80	Zone-2	0.000	731.96	559
3661	J-2-188	674.70	Zone-2	0.000	731.96	560
3663	J-2-189	674.20	Zone-2	0.000	731.96	565
690	J-2-19	695.60	Zone-2	0.242	732.01	356
3665	J-2-190	674.10	Zone-2	0.000	731.96	566
3046	J-2-191	687.50	Zone-2	0.000	731.97	435
3049	J-2-192	687.00	Zone-2	0.000	731.97	440
2336	J-2-193	690.00	Zone-2	0.000	731.97	411
2339	J-2-194	688.49	Zone-2	0.000	731.97	426
2334	J-2-195	689.74	Zone-2	0.386	731.98	413
2280	J-2-196	686.50	Zone-2	0.000	731.98	445
2282	J-2-197	688.39	Zone-2	0.000	731.98	427
2319	J-2-198	685.00	Zone-2	0.250	731.98	460
2317	J-2-199	682.43	Zone-2	0.000	731.98	485

City of Spuce Grove Water System

FlexTable: Junction Table

Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
701	J-2-2	688.00	Zone-2	0.000	732.01	431
804	J-2-20	695.50	Zone-2	0.174	732.01	357
2286	J-2-200	682.93	Zone-2	0.128	731.98	480
2284	J-2-201	685.67	Zone-2	0.174	731.98	453
2307	J-2-202	688.54	Zone-2	0.189	731.98	425
2305	J-2-203	686.70	Zone-2	0.000	731.98	443
2303	J-2-204	684.90	Zone-2	0.000	731.98	461
2312	J-2-205	684.88	Zone-2	0.454	731.98	461
895	J-2-206	690.31	Zone-2	0.000	731.98	408
2275	J-2-207	691.71	Zone-2	0.061	731.98	394
2272	J-2-208	690.24	Zone-2	0.000	731.98	409
871	J-2-209	687.90	Zone-2	0.000	731.98	431
699	J-2-21	694.70	Zone-2	0.265	732.01	365
608	J-2-210A	691.19	Zone-2	0.030	731.98	399
896	J-2-210B	687.40	Zone-2	0.000	731.98	436
542	J-2-210C	691.41	Zone-2	0.114	731.98	397
2300	J-2-211	685.45	Zone-2	0.000	731.98	455
2325	J-2-212	684.40	Zone-2	0.000	731.98	466
2322	J-2-213	683.47	Zone-2	0.568	731.98	475
2298	J-2-214	683.97	Zone-2	0.000	731.98	470
2296	J-2-215	679.34	Zone-2	0.000	731.98	515
563	J-2-215b	695.00	Zone-2	0.061	732.00	362
698	J-2-215g	692.50	Zone-2	0.000	732.01	387
2294	J-2-216	679.53	Zone-2	0.242	731.98	513
2292	J-2-217	679.66	Zone-2	0.333	731.98	512
2290	J-2-218	679.94	Zone-2	0.355	731.98	509
2288	J-2-219	678.72	Zone-2	0.182	731.98	521
770	J-2-22	695.00	Zone-2	0.288	732.00	362
863	J-2-220	678.00	Zone-2	0.000	731.98	528
3668	J-2-221	678.10	Zone-2	0.000	731.98	527
3670	J-2-222	675.85	Zone-2	0.000	731.98	549
3678	J-2-223	675.66	Zone-2	0.000	731.98	551
3672	J-2-224	676.26	Zone-2	0.000	731.98	545
3674	J-2-225	679.24	Zone-2	0.000	731.98	516
848	J-2-226	678.66	Zone-2	0.000	731.98	522
3683	J-2-227	673.98	Zone-2	0.000	731.98	568
3681	J-2-228	675.14	Zone-2	0.000	731.98	556
592	J-2-23	695.00	Zone-2	0.000	732.00	362
3688	J-2-230	673.73	Zone-2	0.000	731.98	570
3690	J-2-231	674.17	Zone-2	0.000	731.98	566
3692	J-2-232	674.13	Zone-2	0.000	731.98	566
3694	J-2-233	674.13	Zone-2	0.000	731.98	566
3697	J-2-234	673.25	Zone-2	0.000	731.98	575
3701	J-2-235	673.25	Zone-2	0.000	731.98	575
3699	J-2-236	674.44	Zone-2	0.000	731.98	563
2446	J-2-237	691.21	Zone-2	0.000	731.98	399

City of Spuce Grove Water System

FlexTable: Junction Table

Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3686	J-2-237	673.00	Zone-2	0.000	731.98	577
518	J-2-238	688.80	Zone-2	0.000	731.99	423
872	J-2-239	687.63	Zone-2	0.386	731.98	434
741	J-2-24	696.00	Zone-2	0.212	732.00	352
892	J-2-240	685.74	Zone-2	0.469	731.98	453
873	J-2-241	684.72	Zone-2	0.393	731.98	463
899	J-2-242	685.65	Zone-2	0.227	731.98	453
893	J-2-243	686.93	Zone-2	0.643	731.98	441
894	J-2-244	690.24	Zone-2	0.000	731.98	409
2328	J-2-245	683.40	Zone-2	0.000	731.98	475
897	J-2-246	682.65	Zone-2	0.137	731.98	483
874	J-2-247	684.00	Zone-2	0.000	731.99	470
845	J-2-248	677.00	Zone-2	0.000	731.99	538
663	J-2-249	688.80	Zone-2	0.000	731.99	423
756	J-2-25	696.00	Zone-2	0.000	732.00	352
2267	J-2-250	688.72	Zone-2	0.000	731.99	423
2264	J-2-251	685.13	Zone-2	0.114	731.99	459
906	J-2-252	683.72	Zone-2	0.000	731.99	472
907	J-2-253	682.22	Zone-2	0.348	731.99	487
908	J-2-254	682.94	Zone-2	0.204	731.99	480
2262	J-2-255	684.11	Zone-2	0.000	731.99	469
3179	J-2-256	680.44	Zone-2	0.333	731.99	505
3182	J-2-257	681.56	Zone-2	0.099	731.99	494
3184	J-2-258	678.61	Zone-2	0.333	731.99	522
2878	J-2-259	677.60	Zone-2	0.258	731.99	532
564	J-2-26	696.00	Zone-2	0.000	732.00	352
3188	J-2-260	675.57	Zone-2	0.000	731.99	552
2874	J-2-265	676.21	Zone-2	0.166	731.99	546
2255	J-2-266	675.20	Zone-2	0.182	731.99	556
519	J-2-267	680.00	Zone-2	0.159	731.99	509
520	J-2-268	680.90	Zone-2	0.114	731.99	500
732	J-2-269	688.00	Zone-2	0.348	731.99	431
547	J-2-27	696.00	Zone-2	0.280	732.00	352
811	J-2-270	682.50	Zone-2	0.137	732.00	484
752	J-2-271	681.35	Zone-2	0.000	732.00	496
2250	J-2-272	679.30	Zone-2	0.166	732.00	516
557	J-2-273	679.50	Zone-2	0.000	732.00	514
640	J-2-274	680.21	Zone-2	0.151	732.00	507
2253	J-2-275	680.91	Zone-2	0.000	732.00	500
2257	J-2-276	680.58	Zone-2	0.000	731.99	503
2260	J-2-277	681.10	Zone-2	0.000	731.99	498
595	J-2-278	680.07	Zone-2	0.341	732.00	508
800	J-2-279	679.42	Zone-2	0.000	732.00	515
560	J-2-28	696.00	Zone-2	0.000	732.00	352
585	J-2-280	679.74	Zone-2	0.000	732.00	511
795	J-2-281	679.96	Zone-2	0.000	732.00	509

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
702	J-2-282	680.01	Zone-2	0.220	732.00	509
731	J-2-283	684.50	Zone-2	0.000	732.01	465
613	J-2-284	682.87	Zone-2	0.000	732.00	481
680	J-2-285	683.09	Zone-2	0.121	732.00	479
648	J-2-286	681.80	Zone-2	0.000	732.00	491
644	J-2-287	680.50	Zone-2	0.151	732.00	504
588	J-2-288	680.00	Zone-2	0.000	732.00	509
762	J-2-289	682.50	Zone-2	0.106	732.00	484
794	J-2-29	696.00	Zone-2	0.000	732.00	352
816	J-2-290	681.68	Zone-2	0.137	732.00	492
681	J-2-291	679.72	Zone-2	0.000	732.00	512
574	J-2-292	679.11	Zone-2	0.174	732.00	518
817	J-2-293	679.42	Zone-2	0.114	732.00	515
801	J-2-294	677.00	Zone-2	0.189	732.00	538
662	J-2-295	676.38	Zone-2	0.068	732.00	544
2243	J-2-296	676.38	Zone-2	0.295	731.99	544
2246	J-2-297	675.46	Zone-2	0.000	731.99	553
712	J-2-298	676.09	Zone-2	0.137	731.99	547
700	J-2-299	675.42	Zone-2	0.000	731.99	554
787	J-2-3	689.60	Zone-2	0.000	732.01	415
750	J-2-30	696.00	Zone-2	0.000	732.00	352
624	J-2-300	676.40	Zone-2	0.000	731.99	544
2156	J-2-301	676.47	Zone-2	0.000	731.99	543
2173	J-2-302	676.10	Zone-2	0.000	731.99	547
2175	J-2-303	675.65	Zone-2	0.000	731.99	551
2158	J-2-304	674.68	Zone-2	0.348	731.99	561
2160	J-2-305	673.14	Zone-2	0.000	731.99	576
2170	J-2-306	671.27	Zone-2	0.197	731.99	594
2168	J-2-307	670.44	Zone-2	0.000	731.99	602
2166	J-2-308	670.91	Zone-2	0.182	731.99	598
2164	J-2-309	671.34	Zone-2	0.000	731.99	594
570	J-2-31	695.00	Zone-2	0.114	732.01	362
2162	J-2-310	671.71	Zone-2	0.053	731.99	590
844	J-2-311	672.46	Zone-2	0.348	731.99	583
2415	J-2-312	673.33	Zone-2	0.348	731.99	574
2417	J-2-313	674.13	Zone-2	0.000	731.99	566
2419	J-2-314	674.34	Zone-2	0.000	731.99	564
847	J-2-315	674.01	Zone-2	0.355	731.99	567
3173	J-2-316	675.09	Zone-2	0.000	731.99	557
3175	J-2-317	675.62	Zone-2	0.128	731.99	552
2876	J-2-318	675.25	Zone-2	0.288	731.99	555
798	J-2-319	674.65	Zone-2	0.227	731.99	561
697	J-2-32	696.50	Zone-2	0.000	732.00	347
767	J-2-320	686.91	Zone-2	0.000	732.01	441
810	J-2-321	686.91	Zone-2	0.000	732.01	441
779	J-2-322	688.14	Zone-2	0.272	732.01	429

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
562	J-2-323	686.09	Zone-2	0.159	732.00	449
806	J-2-324	685.47	Zone-2	0.121	732.00	455
723	J-2-325	682.68	Zone-2	0.000	732.00	483
671	J-2-326	682.09	Zone-2	0.212	732.00	488
735	J-2-327	680.20	Zone-2	0.000	732.00	507
809	J-2-328	679.16	Zone-2	0.083	732.00	517
839	J-2-328	692.50	Zone-2	0.000	731.98	386
556	J-2-329	677.50	Zone-2	0.068	731.99	533
840	J-2-329	690.30	Zone-2	0.310	731.97	408
724	J-2-33	696.00	Zone-2	0.227	732.00	352
578	J-2-330	677.21	Zone-2	0.000	731.99	536
612	J-2-331	676.50	Zone-2	0.272	731.99	543
696	J-2-332	676.51	Zone-2	0.000	731.99	543
584	J-2-333	677.00	Zone-2	0.197	731.99	538
580	J-2-334	675.05	Zone-2	0.076	731.99	557
709	J-2-335	675.05	Zone-2	0.000	731.99	557
775	J-2-336	672.89	Zone-2	0.114	731.99	578
837	J-2-337	671.08	Zone-2	0.333	731.99	596
2238	J-2-338	670.87	Zone-2	0.000	731.99	598
2241	J-2-339	671.65	Zone-2	0.000	731.99	591
545	J-2-34	695.50	Zone-2	0.000	732.00	357
2222	J-2-340	670.73	Zone-2	0.000	731.99	600
2234	J-2-341	672.33	Zone-2	0.000	731.99	584
2231	J-2-342	671.56	Zone-2	0.189	731.99	591
2229	J-2-343	671.92	Zone-2	0.000	731.99	588
2226	J-2-344	671.92	Zone-2	0.182	731.99	588
838	J-2-345	672.01	Zone-2	0.114	731.99	587
2224	J-2-346	671.65	Zone-2	0.189	731.99	591
2236	J-2-347	672.61	Zone-2	0.000	731.99	581
715	J-2-348	674.08	Zone-2	0.000	731.99	567
543	J-2-349	674.46	Zone-2	0.227	731.99	563
637	J-2-35	695.00	Zone-2	0.144	732.00	362
757	J-2-350	674.84	Zone-2	0.000	731.99	559
617	J-2-351	675.83	Zone-2	0.000	731.99	550
862	J-2-351	693.41	Zone-2	0.000	731.98	377
707	J-2-352	676.90	Zone-2	0.000	731.99	539
737	J-2-353	676.90	Zone-2	0.000	731.99	539
678	J-2-354	677.49	Zone-2	0.000	731.99	533
805	J-2-355	677.22	Zone-2	0.250	731.99	536
780	J-2-356	687.50	Zone-2	0.393	732.01	436
596	J-2-357	681.80	Zone-2	0.000	732.01	491
769	J-2-358	679.89	Zone-2	0.000	732.00	510
781	J-2-359	679.57	Zone-2	0.000	732.00	513
720	J-2-36	695.50	Zone-2	0.000	732.01	357
590	J-2-360	680.00	Zone-2	0.409	732.00	509
734	J-2-361	680.33	Zone-2	0.000	732.00	506

City of Spuce Grove Water System

FlexTable: Junction Table

Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
673	J-2-362	681.46	Zone-2	0.204	732.00	495
561	J-2-363	680.95	Zone-2	0.000	732.00	500
813	J-2-364	680.23	Zone-2	0.000	732.00	507
745	J-2-365	679.88	Zone-2	0.000	732.00	510
635	J-2-366	679.17	Zone-2	0.469	732.00	517
792	J-2-367	679.45	Zone-2	0.537	732.00	514
639	J-2-368	678.76	Zone-2	0.000	732.00	521
765	J-2-369	678.40	Zone-2	0.000	732.00	525
660	J-2-37	693.90	Zone-2	0.000	732.01	373
643	J-2-370	677.80	Zone-2	0.234	732.00	530
517	J-2-371	678.39	Zone-2	0.121	732.00	525
796	J-2-372	679.64	Zone-2	0.000	732.00	512
552	J-2-373	680.50	Zone-2	0.121	732.00	504
675	J-2-374	680.50	Zone-2	0.000	732.00	504
738	J-2-375	680.20	Zone-2	0.000	732.00	507
620	J-2-376	680.40	Zone-2	0.000	732.00	505
868	J-2-377	677.45	Zone-2	0.114	731.99	534
2185	J-2-378	674.83	Zone-2	0.212	731.99	559
2206	J-2-379	676.34	Zone-2	0.000	731.99	545
763	J-2-38	693.00	Zone-2	0.000	732.01	382
870	J-2-380	676.40	Zone-2	0.076	731.99	544
869	J-2-381	677.50	Zone-2	0.197	731.99	533
2183	J-2-381	678.86	Zone-2	0.000	731.99	520
2181	J-2-382	677.74	Zone-2	0.000	731.99	531
2178	J-2-383	676.29	Zone-2	0.280	731.99	545
830	J-2-384	675.98	Zone-2	0.000	731.99	548
2187	J-2-385	673.66	Zone-2	0.371	731.99	571
2208	J-2-386	674.15	Zone-2	0.091	731.99	566
2216	J-2-387	674.03	Zone-2	0.000	731.99	567
2189	J-2-388	673.07	Zone-2	0.424	731.99	577
2191	J-2-389	673.11	Zone-2	0.000	731.99	576
634	J-2-39	692.50	Zone-2	0.000	732.01	387
2203	J-2-390	673.71	Zone-2	0.364	731.99	570
2220	J-2-391	670.00	Zone-2	0.000	731.99	607
2201	J-2-392	672.85	Zone-2	0.000	731.99	579
2199	J-2-393	672.27	Zone-2	0.234	731.99	584
2193	J-2-394	672.19	Zone-2	0.151	731.99	585
900	J-2-395	690.83	Zone-2	0.227	731.98	403
2195	J-2-395	672.00	Zone-2	0.310	731.99	587
901	J-2-396	691.00	Zone-2	0.068	731.97	401
2197	J-2-396	672.86	Zone-2	0.416	731.99	579
902	J-2-397	691.07	Zone-2	0.000	731.97	400
2474	J-2-397	673.84	Zone-2	0.000	731.99	569
903	J-2-398	691.95	Zone-2	0.099	731.97	392
2212	J-2-398	673.62	Zone-2	0.000	731.99	571
778	J-2-4	690.00	Zone-2	0.000	732.01	411

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
729	J-2-40	692.00	Zone-2	0.000	732.01	392
3143	J-2-404	678.50	Zone-2	0.295	731.99	524
2458	J-2-405	677.50	Zone-2	0.416	731.99	533
3140	J-2-409	670.00	Zone-2	0.386	731.99	607
815	J-2-41	692.50	Zone-2	0.764	732.01	387
3147	J-2-410	676.20	Zone-2	0.000	731.99	546
733	J-2-411a	692.17	Zone-2	0.000	732.01	390
610	J-2-412	682.50	Zone-2	0.000	732.01	485
566	J-2-413	682.00	Zone-2	0.303	732.01	489
575	J-2-415	684.00	Zone-2	0.197	732.01	470
679	J-2-416	682.50	Zone-2	0.000	732.01	485
912	J-2-417	682.50	Zone-2	0.288	732.01	485
913	J-2-418	681.50	Zone-2	0.000	732.01	494
2027	J-2-419	682.30	Zone-2	0.000	732.01	486
645	J-2-42	692.50	Zone-2	0.000	732.01	387
2048	J-2-420	682.60	Zone-2	0.000	732.01	484
2029	J-2-421	680.25	Zone-2	0.371	732.01	507
2044	J-2-422	680.30	Zone-2	0.000	732.01	506
2046	J-2-423	677.25	Zone-2	0.000	732.01	536
2031	J-2-424	677.15	Zone-2	0.106	732.01	537
2054	J-2-425	676.30	Zone-2	0.000	732.01	545
2033	J-2-426	676.35	Zone-2	0.106	732.01	545
2035	J-2-427	677.80	Zone-2	0.000	732.01	531
2037	J-2-428	675.00	Zone-2	0.326	732.01	558
829	J-2-429	676.70	Zone-2	0.333	732.01	541
717	J-2-43	692.50	Zone-2	0.000	732.01	387
2039	J-2-430	677.00	Zone-2	0.318	732.01	538
2050	J-2-431	676.50	Zone-2	0.000	732.01	543
785	J-2-431c	682.27	Zone-2	0.000	732.01	487
2041	J-2-432	676.55	Zone-2	0.000	732.01	543
728	J-2-433	682.50	Zone-2	0.121	732.01	485
652	J-2-434	681.54	Zone-2	0.000	732.01	494
587	J-2-435	681.84	Zone-2	0.174	732.01	491
594	J-2-436	682.11	Zone-2	0.189	732.01	488
758	J-2-437	682.60	Zone-2	0.000	732.01	484
591	J-2-438	682.50	Zone-2	0.000	732.01	485
609	J-2-439	681.00	Zone-2	0.212	732.01	499
691	J-2-439	681.56	Zone-2	0.000	732.01	494
630	J-2-44	692.00	Zone-2	0.166	732.00	392
632	J-2-441	681.80	Zone-2	0.137	732.01	491
623	J-2-442	681.20	Zone-2	0.000	732.01	497
725	J-2-443	680.86	Zone-2	0.000	732.01	501
625	J-2-444	682.12	Zone-2	0.220	732.01	488
759	J-2-445	681.50	Zone-2	0.000	732.01	494
827	J-2-446	680.00	Zone-2	0.106	732.01	509
802	J-2-448	682.00	Zone-2	0.000	732.01	489

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
875	J-2-449	680.60	Zone-2	0.000	732.01	503
605	J-2-45	690.00	Zone-2	0.000	732.00	411
876	J-2-450	681.50	Zone-2	0.099	732.01	494
880	J-2-451	680.75	Zone-2	0.204	732.01	502
882	J-2-452	680.75	Zone-2	0.000	732.00	502
881	J-2-453	680.64	Zone-2	0.295	732.00	503
879	J-2-454	680.64	Zone-2	0.151	732.00	503
878	J-2-455	680.64	Zone-2	0.128	732.00	503
877	J-2-456	680.42	Zone-2	0.128	732.00	505
885	J-2-457	681.26	Zone-2	0.000	732.00	497
883	J-2-458	681.00	Zone-2	0.000	732.00	499
650	J-2-459	681.70	Zone-2	0.000	732.01	492
627	J-2-46	690.00	Zone-2	0.083	732.00	411
884	J-2-460	681.10	Zone-2	0.234	732.00	498
3725	J-2-461	681.60	Zone-2	0.000	732.00	493
1969	J-2-462	682.27	Zone-2	0.114	732.00	487
1977	J-2-463	681.00	Zone-2	0.000	732.00	499
1980	J-2-464	680.09	Zone-2	0.121	732.00	508
1982	J-2-465	680.91	Zone-2	0.000	732.00	500
1975	J-2-466	681.11	Zone-2	0.000	732.00	498
2368	J-2-467	683.50	Zone-2	0.000	732.00	475
603	J-2-47	688.50	Zone-2	0.242	732.00	426
3084	J-2-471	684.78	Zone-2	0.000	732.00	462
1955	J-2-472	686.60	Zone-2	0.000	732.01	444
1957	J-2-473	686.70	Zone-2	0.288	732.00	443
1959	J-2-474	686.70	Zone-2	0.106	732.00	443
2020	J-2-475	686.70	Zone-2	0.144	732.00	443
2018	J-2-476	684.96	Zone-2	0.227	732.00	460
2023	J-2-477	684.96	Zone-2	0.000	732.00	460
2025	J-2-478	683.89	Zone-2	0.000	732.00	471
2016	J-2-479	683.89	Zone-2	0.227	732.00	471
667	J-2-48	688.10	Zone-2	0.144	732.00	430
910	J-2-480	682.60	Zone-2	0.393	732.00	484
911	J-2-481	683.24	Zone-2	0.000	732.00	477
1994	J-2-482	681.71	Zone-2	0.000	732.00	492
909	J-2-483	682.10	Zone-2	0.393	732.00	488
1961	J-2-484	685.85	Zone-2	0.000	732.00	452
1984	J-2-485	685.30	Zone-2	0.000	732.00	457
1986	J-2-486	684.63	Zone-2	0.220	732.00	464
1988	J-2-487	685.50	Zone-2	0.000	732.00	455
1992	J-2-488	683.81	Zone-2	0.000	732.00	472
1990	J-2-489	682.80	Zone-2	0.182	732.00	482
692	J-2-49	690.00	Zone-2	0.000	732.00	411
2014	J-2-490	684.50	Zone-2	0.000	732.00	465
2012	J-2-491	682.00	Zone-2	0.204	732.00	489
1973	J-2-492	683.50	Zone-2	0.303	732.00	475

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
1971	J-2-493	683.92	Zone-2	0.182	732.00	471
2004	J-2-494	684.50	Zone-2	0.000	732.00	465
2002	J-2-495	684.26	Zone-2	0.454	732.00	467
1998	J-2-496	684.16	Zone-2	0.355	732.00	468
2000	J-2-497	684.20	Zone-2	0.288	732.00	468
2006	J-2-498	684.42	Zone-2	0.061	732.00	466
2008	J-2-499	684.79	Zone-2	0.212	732.00	462
784	J-2-5	693.00	Zone-2	0.000	732.01	382
576	J-2-50	692.00	Zone-2	0.174	732.00	392
2010	J-2-500	685.28	Zone-2	0.000	732.00	457
3076	J-2-501	684.98	Zone-2	0.053	732.00	460
3074	J-2-502	684.38	Zone-2	0.166	732.00	466
3364	J-2-503	684.63	Zone-2	0.507	732.00	464
3366	J-2-504	684.73	Zone-2	0.000	732.00	463
3081	J-2-505	684.07	Zone-2	0.402	732.00	469
824	J-2-506	683.62	Zone-2	0.341	732.00	474
825	J-2-507	683.78	Zone-2	0.242	732.00	472
3071	J-2-508	683.95	Zone-2	0.182	732.00	470
3132	J-2-509	684.58	Zone-2	0.174	732.00	464
739	J-2-51	692.00	Zone-2	0.000	732.00	392
3134	J-2-510	685.79	Zone-2	0.159	732.00	452
3137	J-2-511	687.00	Zone-2	0.000	732.00	440
1967	J-2-512	687.27	Zone-2	0.371	732.00	438
1965	J-2-513	689.10	Zone-2	0.000	732.01	420
3714	J-2-514	689.10	Zone-2	0.000	732.09	421
3164	J-2-515	689.74	Zone-2	0.000	732.09	414
3166	J-2-516	690.81	Zone-2	0.000	732.09	404
3168	J-2-518	690.00	Zone-2	0.000	732.09	412
3170	J-2-519	690.53	Zone-2	0.371	732.09	407
664	J-2-52	692.50	Zone-2	0.000	732.00	387
2676	J-2-520	692.69	Zone-2	0.083	732.09	386
2076	J-2-521	691.50	Zone-2	0.000	732.24	399
3064	J-2-521	694.90	Zone-2	0.000	732.18	365
3062	J-2-522	692.69	Zone-2	0.355	732.17	386
2358	J-2-523	691.60	Zone-2	0.166	732.16	397
2062	J-2-524	694.32	Zone-2	0.333	732.14	370
2064	J-2-525	692.52	Zone-2	0.272	732.11	387
2360	J-2-526	691.00	Zone-2	0.076	732.10	402
2362	J-2-527	691.99	Zone-2	0.106	732.10	393
2364	J-2-528	689.50	Zone-2	0.137	732.09	417
891	J-2-529	688.53	Zone-2	0.280	732.09	426
3056	J-2-530	689.45	Zone-2	0.137	732.08	417
3054	J-2-531	688.61	Zone-2	0.174	732.07	425
3052	J-2-532	688.41	Zone-2	0.099	732.07	427
2366	J-2-533	689.11	Zone-2	0.166	732.06	420
653	J-2-54	692.20	Zone-2	0.182	732.00	390

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
886	J-2-544	688.00	Zone-2	0.326	732.06	431
887	J-2-545	685.00	Zone-2	0.197	732.05	460
822	J-2-546	688.50	Zone-2	0.182	732.06	426
888	J-2-547	689.32	Zone-2	0.151	732.07	418
889	J-2-548	691.20	Zone-2	0.137	732.08	400
890	J-2-549	691.58	Zone-2	0.402	732.09	397
740	J-2-55	691.44	Zone-2	0.227	732.00	397
649	J-2-550	688.00	Zone-2	0.151	732.03	431
864	J-2-551	687.73	Zone-2	0.000	732.02	433
2149	J-2-552	686.82	Zone-2	0.204	732.02	442
2151	J-2-553	686.16	Zone-2	0.204	732.02	449
2153	J-2-554	686.04	Zone-2	0.182	732.02	450
865	J-2-555	685.10	Zone-2	0.000	732.01	459
516	J-2-556	686.47	Zone-2	0.000	732.02	446
475	J-2-557	686.36	Zone-2	0.000	732.01	447
760	J-2-558	684.25	Zone-2	0.326	732.01	467
764	J-2-559	683.00	Zone-2	0.000	732.01	480
615	J-2-56	689.50	Zone-2	0.000	732.00	416
581	J-2-560	684.00	Zone-2	0.144	732.01	470
727	J-2-561	686.00	Zone-2	0.000	732.01	450
782	J-2-562	684.00	Zone-2	0.371	732.01	470
761	J-2-563	682.50	Zone-2	0.000	732.01	485
559	J-2-564	682.30	Zone-2	0.000	732.01	486
548	J-2-565	685.00	Zone-2	0.000	732.01	460
799	J-2-566	684.74	Zone-2	0.000	732.01	463
687	J-2-567	684.47	Zone-2	0.000	732.01	465
808	J-2-568	684.00	Zone-2	0.310	732.01	470
814	J-2-57	689.00	Zone-2	0.000	732.00	421
646	J-2-570	683.00	Zone-2	0.159	732.01	480
573	J-2-571	683.88	Zone-2	0.000	732.01	471
743	J-2-572	682.87	Zone-2	0.560	732.01	481
577	J-2-573	683.60	Zone-2	0.000	732.01	474
746	J-2-574	684.55	Zone-2	0.121	732.01	464
551	J-2-575	684.35	Zone-2	0.000	732.01	466
636	J-2-576	683.00	Zone-2	0.000	732.01	480
721	J-2-578	683.50	Zone-2	0.000	732.01	475
568	J-2-579	683.00	Zone-2	0.000	732.01	480
719	J-2-58	692.00	Zone-2	0.000	732.00	392
682	J-2-580	682.70	Zone-2	0.000	732.01	483
600	J-2-581	682.50	Zone-2	0.000	732.01	485
647	J-2-582	682.50	Zone-2	0.000	732.01	485
704	J-2-583	682.50	Zone-2	0.000	732.01	485
711	J-2-584	681.50	Zone-2	0.000	732.01	494
674	J-2-585	681.00	Zone-2	0.000	732.01	499
2278	J-2-585-1	692.21	Zone-2	0.121	731.98	389
567	J-2-586	682.60	Zone-2	0.151	732.01	484

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
705	J-2-587	681.39	Zone-2	0.083	732.01	495
744	J-2-588	681.76	Zone-2	0.000	732.01	492
661	J-2-589	682.28	Zone-2	0.000	732.01	487
789	J-2-59	691.50	Zone-2	0.144	732.00	396
771	J-2-590	683.13	Zone-2	0.121	732.01	478
586	J-2-591	683.85	Zone-2	0.159	732.01	471
621	J-2-592	682.81	Zone-2	0.220	732.01	481
791	J-2-593	683.56	Zone-2	0.189	732.01	474
776	J-2-594	684.69	Zone-2	0.166	732.01	463
598	J-2-595	685.27	Zone-2	0.000	732.01	457
788	J-2-596	686.64	Zone-2	0.114	732.01	444
803	J-2-597	691.70	Zone-2	0.204	732.01	395
656	J-2-598	687.50	Zone-2	0.000	732.01	436
714	J-2-599	685.10	Zone-2	0.000	732.01	459
694	J-2-6	693.60	Zone-2	0.439	732.01	376
641	J-2-60	691.50	Zone-2	0.182	732.00	396
718	J-2-600	694.00	Zone-2	0.000	732.01	372
655	J-2-601	692.50	Zone-2	0.189	732.01	387
783	J-2-602	692.50	Zone-2	0.000	732.01	387
742	J-2-603	688.00	Zone-2	0.128	732.01	431
666	J-2-604	686.50	Zone-2	0.000	732.01	445
706	J-2-605	685.22	Zone-2	0.272	732.01	458
710	J-2-606	684.23	Zone-2	0.099	732.01	468
684	J-2-607	685.00	Zone-2	0.250	732.00	460
753	J-2-608	687.69	Zone-2	0.000	732.00	434
569	J-2-609	683.54	Zone-2	0.000	732.00	474
631	J-2-61	689.90	Zone-2	0.326	732.00	412
593	J-2-610	689.49	Zone-2	0.242	732.00	416
722	J-2-611	689.98	Zone-2	0.250	732.00	411
565	J-2-612	691.68	Zone-2	0.159	732.00	395
766	J-2-613	692.14	Zone-2	0.144	732.00	390
602	J-2-614	688.54	Zone-2	0.242	732.01	425
686	J-2-615	687.50	Zone-2	0.000	732.01	436
677	J-2-616	690.00	Zone-2	0.272	732.01	411
633	J-2-617	693.00	Zone-2	0.000	732.01	382
604	J-2-618	694.00	Zone-2	0.000	732.01	372
589	J-2-619	687.50	Zone-2	0.159	732.01	436
628	J-2-62	690.00	Zone-2	0.000	732.00	411
571	J-2-620	689.50	Zone-2	0.000	732.01	416
546	J-2-621	692.50	Zone-2	0.000	732.01	387
777	J-2-622	691.68	Zone-2	0.000	732.00	395
726	J-2-623	695.00	Zone-2	0.000	732.00	362
629	J-2-624	695.50	Zone-2	0.000	732.00	357
607	J-2-625	694.50	Zone-2	0.000	732.00	367
665	J-2-626	695.00	Zone-2	0.000	732.00	362
550	J-2-63	692.00	Zone-2	0.287	732.00	391

City of Spuce Grove Water System

FlexTable: Junction Table

Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
755	J-2-64	690.50	Zone-2	0.204	731.99	406
2486	J-2-646	677.13	Zone-2	0.121	731.96	537
768	J-2-65	692.50	Zone-2	0.083	731.99	387
693	J-2-66	694.00	Zone-2	0.272	731.99	372
790	J-2-67	692.50	Zone-2	0.000	732.00	387
614	J-2-68	692.50	Zone-2	0.000	732.00	387
597	J-2-69	694.50	Zone-2	0.326	732.00	367
572	J-2-7	692.50	Zone-2	0.000	732.01	387
554	J-2-70	694.00	Zone-2	0.000	732.00	372
797	J-2-71	694.76	Zone-2	0.242	732.00	364
582	J-2-72	691.89	Zone-2	0.165	732.00	393
638	J-2-73	693.00	Zone-2	0.174	732.00	382
730	J-2-74	693.77	Zone-2	0.258	732.00	374
601	J-2-75	696.80	Zone-2	0.227	732.00	345
558	J-2-76	698.57	Zone-2	0.258	732.01	327
583	J-2-77	695.20	Zone-2	0.295	732.01	360
695	J-2-78	694.15	Zone-2	0.000	732.01	370
555	J-2-79	693.17	Zone-2	0.121	732.00	380
708	J-2-8	690.20	Zone-2	0.045	732.01	409
774	J-2-80	692.50	Zone-2	0.000	732.00	387
659	J-2-81	698.00	Zone-2	0.000	732.00	333
670	J-2-82	700.17	Zone-2	0.280	732.00	311
657	J-2-83	699.45	Zone-2	0.159	731.99	318
683	J-2-84	696.16	Zone-2	0.000	731.99	351
544	J-2-85	694.50	Zone-2	0.000	731.99	367
622	J-2-86	692.50	Zone-2	0.174	731.99	386
688	J-2-87	693.00	Zone-2	0.000	731.99	382
812	J-2-88	692.50	Zone-2	0.000	731.99	386
807	J-2-89	692.19	Zone-2	0.000	731.99	389
749	J-2-9	688.00	Zone-2	0.281	732.01	431
642	J-2-90	691.90	Zone-2	0.272	731.99	392
3606	J-2-91	693.74	Zone-2	0.000	731.99	374
3608	J-2-92	694.52	Zone-2	0.000	731.99	367
329	J-2-93	697.08	Zone-2	0.000	732.00	342
672	J-2-93	693.29	Zone-2	0.166	731.98	379
754	J-2-94	693.40	Zone-2	0.114	731.98	378
654	J-2-95	698.61	Zone-2	0.137	731.99	327
541	J-2-96	699.88	Zone-2	0.227	731.98	314
618	J-2-97	700.17	Zone-2	0.053	731.98	311
751	J-2-98	695.72	Zone-2	0.250	731.98	355
747	J-2-99	695.86	Zone-2	0.000	731.98	354
3636	J-12	682.11	Zone-2	0.787	731.96	488
3729	J-49	687.89	Zone-2	0.000	731.98	432
3732	J-50	686.49	Zone-2	0.000	731.98	445
3735	J-51	686.31	Zone-2	0.000	731.98	447
3738	J-52	675.03	Zone-2	0.000	731.98	557

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: ADD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3766	J-62	696.70	Zone-2	0.000	732.00	345
3769	J-63	696.00	Zone-2	0.000	731.99	352
3772	J-64	700.87	<None>	0.000	731.98	305
3774	J-65	688.17	Zone-2	0.000	731.97	429
4182	J-208	690.44	Zone-2	0.000	732.09	408
4279	J-245	690.23	Zone-2	0.000	732.09	410
4285	J-247	690.54	Zone-2	0.000	732.09	407
4448	J-252	673.70	<None>	0.000	731.99	570
1953	J-444	686.80	Zone-2	0.000	732.01	442
2560	J-659	686.50	Zone-2	0.121	732.02	445
2562	J-660	687.00	Zone-2	0.114	732.02	441
2564	J-661	688.10	Zone-2	0.137	732.02	430
2567	J-662	686.30	Zone-2	0.220	732.02	447
2569	J-663	686.50	Zone-2	0.000	732.02	445
2571	J-664	685.20	Zone-2	0.000	732.02	458
2573	J-665	687.20	Zone-2	0.000	732.02	439
2575	J-666	684.50	Zone-2	0.000	732.02	465

APPENDIX F

Maximum Day Demand - 2020

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
2781	J-1-1	710.78	Zone-1	0.000	756.40	446
2893	J-1-10	692.50	Zone-1	0.000	755.64	618
323	J-1-100	700.00	Zone-1	0.000	755.48	543
331	J-1-101	695.60	Zone-1	0.644	755.47	586
326	J-1-102	698.50	Zone-1	0.265	755.40	557
327	J-1-103	700.17	Zone-1	1.098	755.40	540
3030	J-1-104	701.02	Zone-1	0.000	755.40	532
3032	J-1-105	701.76	Zone-1	0.000	755.40	525
328	J-1-106	701.60	Zone-1	0.000	755.40	526
310	J-1-107	701.80	Zone-1	0.000	755.66	527
253	J-1-108	704.24	Zone-1	0.681	755.66	503
254	J-1-109	706.00	Zone-1	0.189	755.66	486
2709	J-1-11	707.80	Zone-1	0.000	756.18	474
256	J-1-110	705.20	Zone-1	0.000	755.66	494
255	J-1-111	705.90	Zone-1	0.738	755.66	487
252	J-1-112	706.25	Zone-1	0.436	755.67	484
423	J-1-113	705.46	Zone-1	0.568	755.66	491
424	J-1-114	706.30	Zone-1	0.549	755.66	483
263	J-1-115	704.15	Zone-1	0.531	755.64	504
434	J-1-116	701.65	Zone-1	0.605	755.63	528
262	J-1-117	697.35	Zone-1	0.397	755.62	570
265	J-1-118	698.57	Zone-1	0.586	755.63	558
425	J-1-119	701.80	Zone-1	0.492	755.63	527
2713	J-1-12	708.40	Zone-1	0.000	756.18	468
435	J-1-120	702.40	Zone-1	0.284	755.65	521
264	J-1-121	700.70	Zone-1	0.455	755.65	538
267	J-1-122	702.40	Zone-1	0.000	755.65	521
266	J-1-123	702.35	Zone-1	0.000	755.65	522
251	J-1-124	705.41	Zone-1	0.000	755.68	492
257	J-1-125	704.75	Zone-1	0.473	755.67	498
258	J-1-126	704.00	Zone-1	0.000	755.67	506
259	J-1-127	701.25	Zone-1	0.341	755.66	533
260	J-1-128	699.65	Zone-1	0.000	755.65	548
261	J-1-129	698.54	Zone-1	0.815	755.64	559
2711	J-1-13	707.50	Zone-1	0.000	756.18	476
426	J-1-130	698.75	Zone-1	0.000	755.64	557
268	J-1-131	700.95	Zone-1	0.473	755.66	535
269	J-1-132	700.10	Zone-1	0.455	755.67	544
427	J-1-132	701.30	Zone-1	0.000	755.67	532
270	J-1-133	700.03	Zone-1	0.000	755.67	545
250	J-1-134	707.00	Zone-1	0.000	755.71	477
248	J-1-135	705.60	Zone-1	0.000	755.78	491
246	J-1-136	705.00	Zone-1	0.000	755.84	498
438	J-1-137	705.90	Zone-1	0.000	755.93	490
241	J-1-138	708.50	Zone-1	1.833	755.99	465
242	J-1-139	708.35	Zone-1	0.000	755.96	466

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
412	J-1-14	711.50	Zone-1	1.008	756.12	437
243	J-1-140	708.05	Zone-1	0.948	755.86	468
3024	J-1-142	707.08	Zone-1	0.000	755.87	478
408	J-1-143	708.70	Zone-1	0.000	755.88	462
407	J-1-144	709.70	Zone-1	0.000	755.91	452
301	J-1-145	708.23	Zone-1	1.495	755.83	466
302	J-1-146	706.28	Zone-1	0.000	755.86	485
303	J-1-147	706.37	Zone-1	0.862	755.84	484
442	J-1-148	705.19	Zone-1	0.000	755.81	495
278	J-1-149	705.90	Zone-1	1.000	755.80	488
342	J-1-15	712.40	Zone-1	1.008	756.12	428
244	J-1-150	706.71	Zone-1	0.909	755.80	480
245	J-1-151	705.85	Zone-1	0.000	755.81	489
283	J-1-152	704.63	Zone-1	2.810	755.75	500
277	J-1-153	704.10	Zone-1	0.901	755.76	506
280	J-1-154	704.82	Zone-1	1.076	755.76	499
444	J-1-155	704.70	Zone-1	0.000	755.76	500
446	J-1-156	705.00	Zone-1	0.000	755.75	497
299	J-1-157	705.86	Zone-1	0.963	755.74	488
298	J-1-158	706.53	Zone-1	1.695	755.74	482
443	J-1-159	707.10	Zone-1	0.000	755.76	476
341	J-1-16	712.10	Zone-1	1.008	756.10	431
300	J-1-160	708.50	Zone-1	0.000	755.77	463
285	J-1-161	705.30	Zone-1	0.963	755.74	494
397	J-1-161	707.40	Zone-1	0.000	755.75	473
276	J-1-162	702.69	Zone-1	0.000	755.73	519
282	J-1-163	704.25	Zone-1	0.378	755.72	504
284	J-1-164	704.25	Zone-1	1.076	755.71	504
271	J-1-165	701.80	Zone-1	1.504	755.68	527
272	J-1-166	698.80	Zone-1	0.829	755.64	556
273	J-1-167	699.60	Zone-1	0.553	755.68	549
274	J-1-168	700.40	Zone-1	0.909	755.69	541
275	J-1-169	700.30	Zone-1	1.195	755.71	542
345	J-1-17	710.50	Zone-1	1.008	756.10	446
286	J-1-170	705.37	Zone-1	1.004	755.72	493
287	J-1-171	701.77	Zone-1	0.901	755.71	528
3717	J-1-172	700.49	Zone-1	0.000	755.71	540
3721	J-1-173	696.90	Zone-1	0.000	755.72	576
474	J-1-174	699.50	Zone-1	1.304	755.72	550
288	J-1-175	701.40	Zone-1	0.315	755.74	532
2935	J-1-176	703.83	Zone-1	0.000	755.74	508
2932	J-1-177	699.44	Zone-1	0.000	755.74	551
410	J-1-178	697.90	Zone-1	0.261	755.74	566
304	J-1-179	698.70	Zone-1	0.000	755.62	557
346	J-1-18	709.30	Zone-1	2.016	756.11	458
305	J-1-180	698.46	Zone-1	0.000	755.61	559

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
307	J-1-181	698.30	Zone-1	0.000	755.60	561
306	J-1-182	697.89	Zone-1	0.000	755.60	565
309	J-1-183	698.00	Zone-1	2.680	755.58	564
308	J-1-184	695.00	Zone-1	0.000	755.31	590
2386	J-1-185	701.16	Zone-1	0.000	755.78	535
289	J-1-186	700.10	Zone-1	0.000	755.76	545
296	J-1-187	705.89	Zone-1	0.000	755.74	488
439	J-1-188	706.53	Zone-1	0.000	755.74	482
297	J-1-189	706.53	Zone-1	0.000	755.74	482
2130	J-1-19	709.00	Zone-1	1.008	756.11	461
295	J-1-190	707.00	Zone-1	0.000	755.73	477
413	J-1-191	705.31	Zone-1	0.000	755.73	493
294	J-1-192	704.70	Zone-1	0.000	755.73	499
293	J-1-193	702.72	Zone-1	0.000	755.73	519
432	J-1-194	702.10	Zone-1	0.000	755.73	525
292	J-1-195	700.60	Zone-1	0.000	755.74	540
290	J-1-196	698.20	Zone-1	0.000	755.74	563
401	J-1-197	700.03	Zone-1	0.000	755.75	545
400	J-1-198	700.00	Zone-1	0.455	755.70	545
402	J-1-199	700.90	Zone-1	0.000	755.70	536
447	J-1-2	709.00	Zone-1	0.000	756.33	463
403	J-1-200	701.51	Zone-1	0.000	755.70	530
399	J-1-201	699.94	Zone-1	0.000	755.64	545
398	J-1-202	700.86	Zone-1	0.000	755.61	536
404	J-1-203	702.39	Zone-1	1.212	755.59	521
429	J-1-204	704.20	Zone-1	0.000	755.59	503
405	J-1-205	705.75	Zone-1	0.568	755.58	488
393	J-1-206	704.10	Zone-1	0.000	755.58	504
396	J-1-207	705.50	Zone-1	0.000	755.73	492
395	J-1-208	705.10	Zone-1	0.000	755.67	495
394	J-1-209	704.60	Zone-1	0.000	755.59	499
485	J-1-21	708.96	Zone-1	0.000	756.12	462
361	J-1-210	704.50	Zone-1	0.000	755.55	500
366	J-1-211	703.30	Zone-1	0.000	755.55	511
384	J-1-212	703.50	Zone-1	0.000	755.54	509
383	J-1-213	703.00	Zone-1	0.000	755.54	514
367	J-1-214	703.23	Zone-1	0.000	755.54	512
387	J-1-215	702.50	Zone-1	0.378	755.57	519
391	J-1-216	702.30	Zone-1	0.000	755.58	521
390	J-1-217	701.50	Zone-1	0.644	755.60	529
389	J-1-218	699.60	Zone-1	0.510	755.58	548
428	J-1-219	696.80	Zone-1	0.000	755.58	575
480	J-1-22	709.88	Zone-1	0.000	756.13	453
388	J-1-220	700.25	Zone-1	0.531	755.58	541
368	J-1-221	700.51	Zone-1	0.302	755.53	538
371	J-1-222	698.22	Zone-1	0.378	755.52	561

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
372	J-1-223	698.70	Zone-1	0.000	755.52	556
431	J-1-224	696.77	Zone-1	0.247	755.52	575
370	J-1-225	697.57	Zone-1	0.265	755.51	567
373	J-1-226	696.70	Zone-1	0.000	755.51	576
369	J-1-227	696.99	Zone-1	0.000	755.51	573
374	J-1-228	697.42	Zone-1	0.208	755.52	569
386	J-1-229	697.60	Zone-1	0.000	755.52	567
2137	J-1-23	708.17	Zone-1	0.000	756.14	469
385	J-1-230	699.30	Zone-1	0.000	755.52	550
375	J-1-231	698.87	Zone-1	0.000	755.52	554
376	J-1-232	702.40	Zone-1	0.568	755.53	520
377	J-1-233	702.50	Zone-1	0.436	755.53	519
381	J-1-234	703.70	Zone-1	0.000	755.53	507
378	J-1-235	701.50	Zone-1	0.510	755.53	529
380	J-1-236	701.20	Zone-1	0.000	755.53	532
379	J-1-237	702.10	Zone-1	0.000	755.53	523
359	J-1-238	702.50	Zone-1	0.000	755.53	519
360	J-1-239	704.30	Zone-1	0.000	755.54	501
2135	J-1-24	708.54	Zone-1	1.008	756.13	466
357	J-1-240	703.30	Zone-1	0.000	755.53	511
358	J-1-241	703.30	Zone-1	0.000	755.53	511
356	J-1-242	705.00	Zone-1	0.000	755.56	495
353	J-1-243	705.70	Zone-1	1.008	755.59	488
354	J-1-244	706.70	Zone-1	1.008	755.82	481
355	J-1-245	707.10	Zone-1	1.008	755.88	477
2390	J-1-246	708.00	Zone-1	0.000	755.92	469
351	J-1-247	703.75	Zone-1	1.008	755.58	507
350	J-1-248	703.90	Zone-1	1.008	755.60	506
436	J-1-249	705.30	Zone-1	1.008	755.59	492
3710	J-1-25	709.40	Zone-1	0.000	756.12	457
411	J-1-250	702.80	Zone-1	1.008	755.57	516
352	J-1-251	705.65	Zone-1	1.008	755.56	488
448	J-1-252	705.00	Zone-1	0.000	755.55	495
451	J-1-253	705.00	Zone-1	1.008	755.55	495
450	J-1-254	705.00	Zone-1	1.008	755.55	495
449	J-1-255	705.00	Zone-1	1.008	755.55	495
452	J-1-256	705.00	Zone-1	1.008	755.55	495
453	J-1-257	705.00	Zone-1	1.008	755.54	495
456	J-1-258	705.00	Zone-1	0.000	755.52	494
364	J-1-259	704.31	Zone-1	0.000	755.50	501
3708	J-1-26	709.50	Zone-1	0.000	756.11	456
363	J-1-260	704.00	Zone-1	0.000	755.49	504
362	J-1-261	701.75	Zone-1	0.000	755.49	526
2106	J-1-262	701.78	Zone-1	0.000	755.49	526
365	J-1-263	700.00	Zone-1	0.000	755.49	543
459	J-1-264	698.25	Zone-1	0.000	755.45	560

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
920	J-1-266	698.29	Zone-1	0.000	755.45	559
918	J-1-267	696.65	Zone-1	0.000	755.45	575
2072	J-1-268	698.29	Zone-1	0.000	755.45	559
2067	J-1-269	698.13	Zone-1	0.000	755.45	561
2139	J-1-27	709.27	Zone-1	0.000	756.18	459
917	J-1-270	696.76	Zone-1	0.000	755.45	574
2069	J-1-271	696.95	Zone-1	0.000	755.45	573
915	J-1-272	695.00	Zone-1	0.000	755.45	592
462	J-1-273	694.94	Zone-1	0.000	755.45	592
512	J-1-274	692.00	Zone-1	0.000	755.43	621
2080	J-1-275	693.53	Zone-1	0.000	755.45	606
2092	J-1-276	694.01	Zone-1	0.000	755.45	601
2095	J-1-277	693.00	Zone-1	0.775	755.46	611
2101	J-1-278	694.20	Zone-1	0.000	755.46	600
2103	J-1-279	694.00	Zone-1	0.000	755.46	602
2141	J-1-28	713.00	Zone-1	0.000	756.29	424
2099	J-1-280	695.00	Zone-1	0.000	755.46	592
2097	J-1-281	694.50	Zone-1	1.098	755.46	597
2583	J-1-282	694.94	Zone-1	0.152	755.46	592
2110	J-1-283	695.43	Zone-1	0.644	755.47	588
2113	J-1-284	693.50	Zone-1	0.000	755.47	607
2115	J-1-285	693.30	Zone-1	0.000	755.48	609
2117	J-1-286	696.05	Zone-1	0.644	755.48	582
2586	J-1-287	692.20	Zone-1	0.171	755.46	619
3092	J-1-288	690.20	Zone-1	0.189	755.45	639
409	J-1-29	713.40	Zone-1	1.008	756.32	420
2592	J-1-290	687.40	Zone-1	0.889	755.44	666
919	J-1-291	697.00	Zone-1	0.000	755.45	572
916	J-1-292	696.46	Zone-1	0.000	755.45	577
2083	J-1-295	690.00	Zone-1	1.172	755.44	640
2089	J-1-296	690.00	Zone-1	0.000	755.44	640
2087	J-1-297	689.70	Zone-1	1.022	755.44	643
2085	J-1-298	690.15	Zone-1	0.000	755.44	639
3211	J-1-299	688.45	Zone-1	0.000	755.44	656
2812	J-1-3	708.56	Zone-1	0.000	756.18	466
3705	J-1-30	712.31	Zone-1	0.000	756.32	431
3213	J-1-300	688.10	Zone-1	0.000	755.44	659
2577	J-1-301	689.55	Zone-1	0.889	755.44	645
2581	J-1-302	689.75	Zone-1	0.000	755.44	643
2579	J-1-303	688.40	Zone-1	0.000	755.43	656
440	J-1-304	690.70	Zone-1	0.000	755.43	634
2056	J-1-305	691.00	Zone-1	0.000	755.37	630
2058	J-1-306	691.00	Zone-1	0.000	755.31	629
2060	J-1-307	691.50	Zone-1	0.000	755.23	624
454	J-1-308	705.00	Zone-1	1.008	755.59	495
455	J-1-309	703.40	Zone-1	0.000	755.67	512

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
339	J-1-31	714.40	Zone-1	1.008	756.37	411
421	J-1-310	702.50	Zone-1	1.008	755.67	520
349	J-1-311	703.75	Zone-1	1.008	755.68	508
347	J-1-312	703.60	Zone-1	1.008	755.85	511
420	J-1-313	701.69	Zone-1	1.008	755.87	530
348	J-1-314	702.95	Zone-1	1.008	755.74	517
2121	J-1-315	702.06	Zone-1	0.000	755.97	528
2122	J-1-316	702.62	Zone-1	0.000	756.02	523
2133	J-1-317	703.48	Zone-1	0.000	756.02	514
473	J-1-32	711.71	Zone-1	1.008	756.17	435
2124	J-1-320	703.24	Zone-1	1.008	756.05	517
2126	J-1-321	703.12	Zone-1	1.008	756.08	518
344	J-1-322	705.00	Zone-1	1.008	755.99	499
2128	J-1-323	706.83	Zone-1	1.008	756.10	482
486	J-1-325	707.14	Zone-1	0.000	756.11	479
422	J-1-326	709.50	Zone-1	1.008	756.06	456
247	J-1-327	704.50	Zone-1	0.189	755.78	502
249	J-1-328	705.50	Zone-1	0.226	755.71	491
279	J-1-329	705.10	Zone-1	0.000	755.78	496
482	J-1-32a	715.56	Zone-1	0.000	756.17	397
476	J-1-33	713.23	Zone-1	0.000	756.17	420
281	J-1-330	704.63	Zone-1	0.247	755.75	500
382	J-1-331	702.50	Zone-1	0.302	755.54	519
392	J-1-332	703.10	Zone-1	0.189	755.58	514
406	J-1-333	703.75	Zone-1	0.000	755.58	507
430	J-1-334	703.20	Zone-1	0.720	755.58	513
437	J-1-335	705.19	Zone-1	1.195	755.80	495
338	J-1-35	709.60	Zone-1	1.008	756.16	456
337	J-1-37	713.90	Zone-1	1.008	756.26	415
340	J-1-38	714.40	Zone-1	1.008	756.24	410
3453	J-1-39	713.00	Zone-1	0.000	756.24	423
533	J-1-4	708.00	Zone-1	0.000	755.98	470
343	J-1-40	711.50	Zone-1	1.008	756.24	438
240	J-1-41	711.50	Zone-1	0.000	756.31	439
441	J-1-41	707.87	Zone-1	2.328	755.87	470
417	J-1-42	713.00	Zone-1	0.000	756.32	424
418	J-1-43	713.00	Zone-1	0.000	756.33	424
414	J-1-44	712.20	Zone-1	0.000	756.33	432
336	J-1-46	712.60	Zone-1	0.000	756.32	428
335	J-1-47	711.00	Zone-1	1.008	756.25	443
334	J-1-48	708.60	Zone-1	1.008	756.05	464
415	J-1-49	706.10	Zone-1	1.008	755.79	486
536	J-1-5	708.23	Zone-1	0.000	755.93	467
3396	J-1-50	704.66	Zone-1	0.000	755.75	500
3399	J-1-51	698.00	Zone-1	0.000	755.75	565
3401	J-1-52	698.00	Zone-1	0.000	755.75	565

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3403	J-1-53	696.00	Zone-1	0.000	755.75	585
333	J-1-56	702.80	Zone-1	0.000	755.69	518
461	J-1-57	702.00	Zone-1	0.000	755.69	525
2351	J-1-58	702.00	Zone-1	0.000	755.63	525
311	J-1-59	700.91	Zone-1	0.397	755.61	535
535	J-1-6	707.50	Zone-1	0.000	755.90	474
312	J-1-60	696.50	Zone-1	0.000	755.55	578
2354	J-1-61	696.90	Zone-1	0.000	755.63	575
526	J-1-62	696.00	Zone-1	0.000	755.53	583
921	J-1-7	706.00	Zone-1	0.000	755.85	488
320	J-1-75	701.15	Zone-1	0.455	755.60	533
318	J-1-76	701.19	Zone-1	0.247	755.58	532
319	J-1-77	701.79	Zone-1	0.284	755.59	526
419	J-1-78	701.56	Zone-1	0.000	755.59	529
317	J-1-79	701.08	Zone-1	0.549	755.56	533
534	J-1-8	701.40	Zone-1	3.108	755.79	532
316	J-1-80	696.70	Zone-1	0.720	755.52	576
315	J-1-81	695.30	Zone-1	0.415	755.52	589
314	J-1-82	695.69	Zone-1	0.492	755.53	586
313	J-1-83	696.25	Zone-1	0.000	755.54	580
433	J-1-84	698.40	Zone-1	0.000	755.54	559
525	J-1-85	695.70	Zone-1	0.946	755.53	586
524	J-1-86	694.60	Zone-1	0.321	755.51	596
529	J-1-87	695.30	Zone-1	0.000	755.51	589
522	J-1-88	694.83	Zone-1	0.625	755.51	594
523	J-1-89	695.78	Zone-1	0.265	755.51	585
923	J-1-9	697.90	Zone-1	0.000	755.77	566
527	J-1-90	695.35	Zone-1	1.154	755.52	589
528	J-1-91	694.60	Zone-1	0.000	755.51	596
530	J-1-92	694.65	Zone-1	0.720	755.51	596
531	J-1-93	696.30	Zone-1	0.455	755.51	580
2693	J-1-94	695.00	Zone-1	0.000	755.51	592
445	J-1-95	695.00	Zone-1	0.681	755.48	592
330	J-1-96	696.80	Zone-1	0.000	755.47	574
324	J-1-97	699.60	Zone-1	0.302	755.46	547
325	J-1-98	700.50	Zone-1	0.000	755.46	538
322	J-1-99	698.35	Zone-1	0.000	755.48	559
3748	J-56	695.10	Zone-1	0.000	755.52	591
3751	J-57	695.10	Zone-1	0.000	755.52	591
3754	J-58	694.60	Zone-1	0.000	755.52	596
3757	J-59	694.92	Zone-1	0.000	755.51	593
3760	J-60	694.45	Zone-1	0.000	755.51	598
3763	J-61	696.30	Zone-1	0.000	755.47	579
3910	J-119	712.61	Zone-1	0.000	756.18	426
4257	J-237	705.00	Zone-1	0.000	755.57	495
4398	J-249	707.70	<None>	0.000	755.99	473

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
685	J-2-1	692.50	Zone-2	0.000	732.01	387
716	J-2-10	689.00	Zone-2	0.000	731.95	420
611	J-2-100	694.34	Zone-2	0.000	731.82	367
668	J-2-101	691.89	Zone-2	0.738	731.82	391
579	J-2-102	694.76	Zone-2	0.415	731.82	363
689	J-2-103	690.90	Zone-2	0.378	731.82	400
658	J-2-104	695.13	Zone-2	0.794	731.83	359
736	J-2-105	693.81	Zone-2	0.000	731.83	372
553	J-2-106	695.70	Zone-2	0.510	731.84	354
703	J-2-107	696.00	Zone-2	0.644	731.86	351
3610	J-2-108	695.90	Zone-2	0.000	731.86	352
793	J-2-109	695.53	Zone-2	0.000	731.87	356
773	J-2-11	685.90	Zone-2	0.000	731.95	451
748	J-2-110	695.18	Zone-2	0.000	731.90	359
549	J-2-111	696.42	Zone-2	0.436	731.92	347
3198	J-2-112	690.20	Zone-2	0.000	731.79	407
3203	J-2-113	686.58	Zone-2	0.000	731.78	442
3201	J-2-114	687.00	Zone-2	0.000	731.78	438
3196	J-2-115	690.50	Zone-2	0.000	731.78	404
3194	J-2-116	688.25	Zone-2	0.000	731.77	426
3086	J-2-117	689.28	Zone-2	0.000	731.75	416
842	J-2-118	688.85	Zone-2	0.000	731.74	420
2679	J-2-119	687.41	Zone-2	0.000	731.73	434
786	J-2-12	685.37	Zone-2	0.946	731.95	456
2684	J-2-120	689.20	Zone-2	0.000	731.73	416
2800	J-2-123	691.00	Zone-2	0.000	731.75	399
856	J-2-126	685.22	Zone-2	0.000	731.72	455
2610	J-2-127	685.10	Zone-2	0.000	731.72	456
2617	J-2-128	685.58	Zone-2	0.397	731.71	451
3208	J-2-129	686.72	Zone-2	0.247	731.71	440
772	J-2-13	684.40	Zone-2	0.321	731.95	465
3206	J-2-130	686.70	Zone-2	0.132	731.71	441
2619	J-2-131	685.37	Zone-2	0.492	731.71	454
2869	J-2-133	687.53	Zone-2	0.681	731.71	432
2871	J-2-134F	686.46	Zone-2	0.000	731.71	443
616	J-2-14	687.00	Zone-2	0.000	731.95	440
599	J-2-15	687.50	Zone-2	0.000	731.95	435
2520	J-2-150	683.02	Zone-2	0.000	731.72	477
853	J-2-151	683.76	Zone-2	5.200	731.72	469
3633	J-2-152	680.27	Zone-2	0.000	731.72	503
3638	J-2-153	679.12	Zone-2	0.000	731.72	515
3641	J-2-154	678.44	Zone-2	0.000	731.72	521
3643	J-2-155	677.55	Zone-2	0.000	731.71	530
3645	J-2-156	677.53	Zone-2	0.000	731.71	530
3647	J-2-157	677.43	Zone-2	0.000	731.71	531
3629	J-2-158	677.47	Zone-2	0.000	731.71	531

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3627	J-2-159	678.29	Zone-2	0.000	731.71	523
619	J-2-16	693.00	Zone-2	0.965	731.95	381
3625	J-2-160	677.29	Zone-2	0.000	731.71	533
3622	J-2-161	677.25	Zone-2	0.000	731.71	533
2488	J-2-162	677.06	Zone-2	0.000	731.71	535
2514	J-2-163	677.02	Zone-2	0.549	731.71	535
843	J-2-165	679.50	Zone-2	0.000	731.72	511
2343	J-2-166	680.00	Zone-2	0.000	731.73	506
2345	J-2-167	684.89	Zone-2	0.000	731.72	458
2511	J-2-168	686.00	Zone-2	0.000	731.72	447
2509	J-2-169	682.80	Zone-2	1.022	731.72	479
676	J-2-17	694.00	Zone-2	0.000	731.96	371
2505	J-2-170	681.56	Zone-2	0.000	731.72	491
2503	J-2-171	681.97	Zone-2	1.022	731.72	487
2501	J-2-172	682.92	Zone-2	1.098	731.72	478
2480	J-2-173	679.36	Zone-2	0.965	731.72	512
3742	J-2-173A	680.19	Zone-2	0.000	731.71	504
3618	J-2-174	680.02	Zone-2	0.000	731.71	506
2498	J-2-175	679.19	Zone-2	1.212	731.71	514
3613	J-2-176	677.42	Zone-2	0.000	731.71	531
3616	J-2-177	678.17	Zone-2	0.000	731.71	524
2482	J-2-178	677.17	Zone-2	0.983	731.71	534
2484	J-2-179	676.62	Zone-2	0.113	731.71	539
2492	J-2-179A	677.97	Zone-2	1.288	731.71	526
713	J-2-18	694.50	Zone-2	0.000	731.96	367
2495	J-2-180	677.04	Zone-2	0.455	731.71	535
852	J-2-181	677.05	Zone-2	0.397	731.71	535
3651	J-2-182	675.35	Zone-2	0.000	731.71	552
3653	J-2-183	675.23	Zone-2	0.000	731.71	553
3655	J-2-184	675.23	Zone-2	0.000	731.71	553
922	J-2-185	675.20	Zone-2	0.870	731.71	553
3657	J-2-186	675.14	Zone-2	0.000	731.71	554
3659	J-2-187	674.80	Zone-2	0.000	731.71	557
3661	J-2-188	674.70	Zone-2	0.000	731.71	558
3663	J-2-189	674.20	Zone-2	0.000	731.71	563
690	J-2-19	695.60	Zone-2	0.605	731.95	356
3665	J-2-190	674.10	Zone-2	0.000	731.71	564
3046	J-2-191	687.50	Zone-2	0.000	731.74	433
3049	J-2-192	687.00	Zone-2	0.000	731.74	438
2336	J-2-193	690.00	Zone-2	0.000	731.76	409
2339	J-2-194	688.49	Zone-2	0.000	731.77	424
2334	J-2-195	689.74	Zone-2	0.965	731.78	411
2280	J-2-196	686.50	Zone-2	0.000	731.78	443
2282	J-2-197	688.39	Zone-2	0.000	731.78	425
2319	J-2-198	685.00	Zone-2	0.625	731.78	458
2317	J-2-199	682.43	Zone-2	0.000	731.79	483

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
701	J-2-2	688.00	Zone-2	0.000	732.00	431
804	J-2-20	695.50	Zone-2	0.436	731.95	357
2286	J-2-200	682.93	Zone-2	0.321	731.79	478
2284	J-2-201	685.67	Zone-2	0.436	731.79	451
2307	J-2-202	688.54	Zone-2	0.473	731.79	423
2305	J-2-203	686.70	Zone-2	0.000	731.79	441
2303	J-2-204	684.90	Zone-2	0.000	731.79	459
2312	J-2-205	684.88	Zone-2	1.135	731.79	459
895	J-2-206	690.31	Zone-2	0.000	731.80	406
2275	J-2-207	691.71	Zone-2	0.152	731.81	392
2272	J-2-208	690.24	Zone-2	0.000	731.81	407
871	J-2-209	687.90	Zone-2	0.000	731.80	430
699	J-2-21	694.70	Zone-2	0.662	731.95	365
608	J-2-210A	691.19	Zone-2	0.076	731.80	397
896	J-2-210B	687.40	Zone-2	0.000	731.80	435
542	J-2-210C	691.41	Zone-2	0.284	731.81	395
2300	J-2-211	685.45	Zone-2	0.000	731.80	454
2325	J-2-212	684.40	Zone-2	0.000	731.80	464
2322	J-2-213	683.47	Zone-2	1.419	731.80	473
2298	J-2-214	683.97	Zone-2	0.000	731.80	468
2296	J-2-215	679.34	Zone-2	0.000	731.80	513
563	J-2-215b	695.00	Zone-2	0.152	731.95	362
698	J-2-215g	692.50	Zone-2	0.000	731.96	386
2294	J-2-216	679.53	Zone-2	0.605	731.79	511
2292	J-2-217	679.66	Zone-2	0.833	731.79	510
2290	J-2-218	679.94	Zone-2	0.889	731.79	507
2288	J-2-219	678.72	Zone-2	0.455	731.79	519
770	J-2-22	695.00	Zone-2	0.720	731.95	362
863	J-2-220	678.00	Zone-2	0.000	731.79	526
3668	J-2-221	678.10	Zone-2	0.000	731.79	525
3670	J-2-222	675.85	Zone-2	0.000	731.79	547
3678	J-2-223	675.66	Zone-2	0.000	731.79	549
3672	J-2-224	676.26	Zone-2	0.000	731.79	543
3674	J-2-225	679.24	Zone-2	0.000	731.79	514
848	J-2-226	678.66	Zone-2	0.000	731.79	520
3683	J-2-227	673.98	Zone-2	0.000	731.79	566
3681	J-2-228	675.14	Zone-2	0.000	731.79	554
592	J-2-23	695.00	Zone-2	0.000	731.95	362
3688	J-2-230	673.73	Zone-2	0.000	731.79	568
3690	J-2-231	674.17	Zone-2	0.000	731.79	564
3692	J-2-232	674.13	Zone-2	0.000	731.79	564
3694	J-2-233	674.13	Zone-2	0.000	731.79	564
3697	J-2-234	673.25	Zone-2	0.000	731.79	573
3701	J-2-235	673.25	Zone-2	0.000	731.79	573
3699	J-2-236	674.44	Zone-2	0.000	731.79	561
2446	J-2-237	691.21	Zone-2	0.000	731.82	397

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3686	J-2-237	673.00	Zone-2	0.000	731.79	575
518	J-2-238	688.80	Zone-2	0.000	731.83	421
872	J-2-239	687.63	Zone-2	0.965	731.82	432
741	J-2-24	696.00	Zone-2	0.531	731.95	352
892	J-2-240	685.74	Zone-2	1.172	731.81	451
873	J-2-241	684.72	Zone-2	0.983	731.81	461
899	J-2-242	685.65	Zone-2	0.568	731.81	452
893	J-2-243	686.93	Zone-2	1.608	731.80	439
894	J-2-244	690.24	Zone-2	0.000	731.81	407
2328	J-2-245	683.40	Zone-2	0.000	731.81	474
897	J-2-246	682.65	Zone-2	0.341	731.82	481
874	J-2-247	684.00	Zone-2	0.000	731.82	468
845	J-2-248	677.00	Zone-2	0.000	731.83	537
663	J-2-249	688.80	Zone-2	0.000	731.86	421
756	J-2-25	696.00	Zone-2	0.000	731.95	352
2267	J-2-250	688.72	Zone-2	0.000	731.87	422
2264	J-2-251	685.13	Zone-2	0.284	731.87	457
906	J-2-252	683.72	Zone-2	0.000	731.87	471
907	J-2-253	682.22	Zone-2	0.870	731.87	486
908	J-2-254	682.94	Zone-2	0.510	731.87	479
2262	J-2-255	684.11	Zone-2	0.000	731.87	467
3179	J-2-256	680.44	Zone-2	0.833	731.86	503
3182	J-2-257	681.56	Zone-2	0.247	731.86	492
3184	J-2-258	678.61	Zone-2	0.833	731.86	521
2878	J-2-259	677.60	Zone-2	0.644	731.86	531
564	J-2-26	696.00	Zone-2	0.000	731.95	352
3188	J-2-260	675.57	Zone-2	0.000	731.85	551
2874	J-2-265	676.21	Zone-2	0.415	731.85	545
2255	J-2-266	675.20	Zone-2	0.455	731.86	555
519	J-2-267	680.00	Zone-2	0.397	731.88	508
520	J-2-268	680.90	Zone-2	0.284	731.88	499
732	J-2-269	688.00	Zone-2	0.870	731.89	430
547	J-2-27	696.00	Zone-2	0.699	731.95	352
811	J-2-270	682.50	Zone-2	0.341	731.93	484
752	J-2-271	681.35	Zone-2	0.000	731.91	495
2250	J-2-272	679.30	Zone-2	0.415	731.91	515
557	J-2-273	679.50	Zone-2	0.000	731.90	513
640	J-2-274	680.21	Zone-2	0.378	731.90	506
2253	J-2-275	680.91	Zone-2	0.000	731.90	499
2257	J-2-276	680.58	Zone-2	0.000	731.88	502
2260	J-2-277	681.10	Zone-2	0.000	731.88	497
595	J-2-278	680.07	Zone-2	0.852	731.91	507
800	J-2-279	679.42	Zone-2	0.000	731.90	514
560	J-2-28	696.00	Zone-2	0.000	731.95	352
585	J-2-280	679.74	Zone-2	0.000	731.90	510
795	J-2-281	679.96	Zone-2	0.000	731.90	508

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
702	J-2-282	680.01	Zone-2	0.549	731.90	508
731	J-2-283	684.50	Zone-2	0.000	731.95	464
613	J-2-284	682.87	Zone-2	0.000	731.94	480
680	J-2-285	683.09	Zone-2	0.302	731.93	478
648	J-2-286	681.80	Zone-2	0.000	731.93	491
644	J-2-287	680.50	Zone-2	0.378	731.92	503
588	J-2-288	680.00	Zone-2	0.000	731.92	508
762	J-2-289	682.50	Zone-2	0.265	731.92	484
794	J-2-29	696.00	Zone-2	0.000	731.95	352
816	J-2-290	681.68	Zone-2	0.341	731.92	492
681	J-2-291	679.72	Zone-2	0.000	731.92	511
574	J-2-292	679.11	Zone-2	0.436	731.92	517
817	J-2-293	679.42	Zone-2	0.284	731.91	514
801	J-2-294	677.00	Zone-2	0.473	731.88	537
662	J-2-295	676.38	Zone-2	0.171	731.86	543
2243	J-2-296	676.38	Zone-2	0.738	731.86	543
2246	J-2-297	675.46	Zone-2	0.000	731.86	552
712	J-2-298	676.09	Zone-2	0.341	731.84	546
700	J-2-299	675.42	Zone-2	0.000	731.83	552
787	J-2-3	689.60	Zone-2	0.000	732.00	415
750	J-2-30	696.00	Zone-2	0.000	731.95	352
624	J-2-300	676.40	Zone-2	0.000	731.83	543
2156	J-2-301	676.47	Zone-2	0.000	731.83	542
2173	J-2-302	676.10	Zone-2	0.000	731.83	545
2175	J-2-303	675.65	Zone-2	0.000	731.83	550
2158	J-2-304	674.68	Zone-2	0.870	731.83	559
2160	J-2-305	673.14	Zone-2	0.000	731.83	574
2170	J-2-306	671.27	Zone-2	0.492	731.83	593
2168	J-2-307	670.44	Zone-2	0.000	731.83	601
2166	J-2-308	670.91	Zone-2	0.455	731.83	596
2164	J-2-309	671.34	Zone-2	0.000	731.83	592
570	J-2-31	695.00	Zone-2	0.284	731.95	362
2162	J-2-310	671.71	Zone-2	0.132	731.83	588
844	J-2-311	672.46	Zone-2	0.870	731.83	581
2415	J-2-312	673.33	Zone-2	0.870	731.83	573
2417	J-2-313	674.13	Zone-2	0.000	731.83	565
2419	J-2-314	674.34	Zone-2	0.000	731.83	563
847	J-2-315	674.01	Zone-2	0.889	731.84	566
3173	J-2-316	675.09	Zone-2	0.000	731.84	555
3175	J-2-317	675.62	Zone-2	0.321	731.85	550
2876	J-2-318	675.25	Zone-2	0.720	731.84	554
798	J-2-319	674.65	Zone-2	0.568	731.82	560
697	J-2-32	696.50	Zone-2	0.000	731.95	347
767	J-2-320	686.91	Zone-2	0.000	731.97	441
810	J-2-321	686.91	Zone-2	0.000	731.95	441
779	J-2-322	688.14	Zone-2	0.681	731.95	429

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
562	J-2-323	686.09	Zone-2	0.397	731.91	448
806	J-2-324	685.47	Zone-2	0.302	731.89	454
723	J-2-325	682.68	Zone-2	0.000	731.86	481
671	J-2-326	682.09	Zone-2	0.531	731.85	487
735	J-2-327	680.20	Zone-2	0.000	731.85	505
809	J-2-328	679.16	Zone-2	0.208	731.84	516
839	J-2-328	692.50	Zone-2	0.000	731.80	385
556	J-2-329	677.50	Zone-2	0.171	731.83	532
840	J-2-329	690.30	Zone-2	0.775	731.77	406
724	J-2-33	696.00	Zone-2	0.568	731.95	352
578	J-2-330	677.21	Zone-2	0.000	731.82	534
612	J-2-331	676.50	Zone-2	0.681	731.80	541
696	J-2-332	676.51	Zone-2	0.000	731.81	541
584	J-2-333	677.00	Zone-2	0.492	731.81	536
580	J-2-334	675.05	Zone-2	0.189	731.81	555
709	J-2-335	675.05	Zone-2	0.000	731.81	556
775	J-2-336	672.89	Zone-2	0.284	731.81	577
837	J-2-337	671.08	Zone-2	0.833	731.80	594
2238	J-2-338	670.87	Zone-2	0.000	731.80	596
2241	J-2-339	671.65	Zone-2	0.000	731.80	589
545	J-2-34	695.50	Zone-2	0.000	731.95	357
2222	J-2-340	670.73	Zone-2	0.000	731.80	598
2234	J-2-341	672.33	Zone-2	0.000	731.80	582
2231	J-2-342	671.56	Zone-2	0.473	731.80	590
2229	J-2-343	671.92	Zone-2	0.000	731.80	586
2226	J-2-344	671.92	Zone-2	0.455	731.80	586
838	J-2-345	672.01	Zone-2	0.284	731.80	585
2224	J-2-346	671.65	Zone-2	0.473	731.80	589
2236	J-2-347	672.61	Zone-2	0.000	731.80	579
715	J-2-348	674.08	Zone-2	0.000	731.80	565
543	J-2-349	674.46	Zone-2	0.568	731.80	561
637	J-2-35	695.00	Zone-2	0.360	731.95	362
757	J-2-350	674.84	Zone-2	0.000	731.80	557
617	J-2-351	675.83	Zone-2	0.000	731.80	548
862	J-2-351	693.41	Zone-2	0.000	731.80	376
707	J-2-352	676.90	Zone-2	0.000	731.80	537
737	J-2-353	676.90	Zone-2	0.000	731.80	537
678	J-2-354	677.49	Zone-2	0.000	731.80	532
805	J-2-355	677.22	Zone-2	0.625	731.77	534
780	J-2-356	687.50	Zone-2	0.983	731.99	435
596	J-2-357	681.80	Zone-2	0.000	731.95	491
769	J-2-358	679.89	Zone-2	0.000	731.95	509
781	J-2-359	679.57	Zone-2	0.000	731.94	513
720	J-2-36	695.50	Zone-2	0.000	731.95	357
590	J-2-360	680.00	Zone-2	1.022	731.94	508
734	J-2-361	680.33	Zone-2	0.000	731.94	505

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
673	J-2-362	681.46	Zone-2	0.510	731.94	494
561	J-2-363	680.95	Zone-2	0.000	731.94	499
813	J-2-364	680.23	Zone-2	0.000	731.94	506
745	J-2-365	679.88	Zone-2	0.000	731.94	510
635	J-2-366	679.17	Zone-2	1.172	731.94	516
792	J-2-367	679.45	Zone-2	1.343	731.94	514
639	J-2-368	678.76	Zone-2	0.000	731.94	520
765	J-2-369	678.40	Zone-2	0.000	731.94	524
660	J-2-37	693.90	Zone-2	0.000	731.96	372
643	J-2-370	677.80	Zone-2	0.586	731.95	530
517	J-2-371	678.39	Zone-2	0.302	731.95	524
796	J-2-372	679.64	Zone-2	0.000	731.95	512
552	J-2-373	680.50	Zone-2	0.302	731.95	504
675	J-2-374	680.50	Zone-2	0.000	731.95	504
738	J-2-375	680.20	Zone-2	0.000	731.95	506
620	J-2-376	680.40	Zone-2	0.000	731.95	504
868	J-2-377	677.45	Zone-2	0.284	731.71	531
2185	J-2-378	674.83	Zone-2	0.531	731.71	557
2206	J-2-379	676.34	Zone-2	0.000	731.72	542
763	J-2-38	693.00	Zone-2	0.000	731.97	381
870	J-2-380	676.40	Zone-2	0.189	731.72	541
869	J-2-381	677.50	Zone-2	0.492	731.72	531
2183	J-2-381	678.86	Zone-2	0.000	731.73	517
2181	J-2-382	677.74	Zone-2	0.000	731.73	528
2178	J-2-383	676.29	Zone-2	0.699	731.73	543
830	J-2-384	675.98	Zone-2	0.000	731.74	546
2187	J-2-385	673.66	Zone-2	0.928	731.72	568
2208	J-2-386	674.15	Zone-2	0.226	731.72	563
2216	J-2-387	674.03	Zone-2	0.000	731.71	565
2189	J-2-388	673.07	Zone-2	1.059	731.71	574
2191	J-2-389	673.11	Zone-2	0.000	731.71	573
634	J-2-39	692.50	Zone-2	0.000	731.99	386
2203	J-2-390	673.71	Zone-2	0.909	731.71	568
2220	J-2-391	670.00	Zone-2	0.000	731.71	604
2201	J-2-392	672.85	Zone-2	0.000	731.71	576
2199	J-2-393	672.27	Zone-2	0.586	731.71	582
2193	J-2-394	672.19	Zone-2	0.378	731.71	582
900	J-2-395	690.83	Zone-2	0.568	731.78	401
2195	J-2-395	672.00	Zone-2	0.775	731.71	584
901	J-2-396	691.00	Zone-2	0.171	731.77	399
2197	J-2-396	672.86	Zone-2	1.041	731.71	576
902	J-2-397	691.07	Zone-2	0.000	731.77	398
2474	J-2-397	673.84	Zone-2	0.000	731.71	566
903	J-2-398	691.95	Zone-2	0.247	731.77	390
2212	J-2-398	673.62	Zone-2	0.000	731.71	569
778	J-2-4	690.00	Zone-2	0.000	732.00	411

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
729	J-2-40	692.00	Zone-2	0.000	731.97	391
3143	J-2-404	678.50	Zone-2	0.738	731.71	521
2458	J-2-405	677.50	Zone-2	1.041	731.71	531
3140	J-2-409	670.00	Zone-2	0.965	731.71	604
815	J-2-41	692.50	Zone-2	1.911	731.96	386
3147	J-2-410	676.20	Zone-2	0.000	731.71	543
733	J-2-411a	692.17	Zone-2	0.000	731.97	389
610	J-2-412	682.50	Zone-2	0.000	731.87	483
566	J-2-413	682.00	Zone-2	0.757	731.86	488
575	J-2-415	684.00	Zone-2	0.492	731.84	468
679	J-2-416	682.50	Zone-2	0.000	731.86	483
912	J-2-417	682.50	Zone-2	0.720	731.84	483
913	J-2-418	681.50	Zone-2	0.000	731.84	493
2027	J-2-419	682.30	Zone-2	0.000	731.84	485
645	J-2-42	692.50	Zone-2	0.000	731.96	386
2048	J-2-420	682.60	Zone-2	0.000	731.84	482
2029	J-2-421	680.25	Zone-2	0.928	731.84	505
2044	J-2-422	680.30	Zone-2	0.000	731.84	504
2046	J-2-423	677.25	Zone-2	0.000	731.83	534
2031	J-2-424	677.15	Zone-2	0.265	731.83	535
2054	J-2-425	676.30	Zone-2	0.000	731.83	543
2033	J-2-426	676.35	Zone-2	0.265	731.83	543
2035	J-2-427	677.80	Zone-2	0.000	731.83	529
2037	J-2-428	675.00	Zone-2	0.815	731.83	556
829	J-2-429	676.70	Zone-2	0.833	731.83	540
717	J-2-43	692.50	Zone-2	0.000	731.96	386
2039	J-2-430	677.00	Zone-2	0.794	731.83	537
2050	J-2-431	676.50	Zone-2	0.000	731.84	542
785	J-2-431c	682.27	Zone-2	0.000	731.86	485
2041	J-2-432	676.55	Zone-2	0.000	731.84	541
728	J-2-433	682.50	Zone-2	0.302	731.84	483
652	J-2-434	681.54	Zone-2	0.000	731.84	492
587	J-2-435	681.84	Zone-2	0.436	731.84	489
594	J-2-436	682.11	Zone-2	0.473	731.84	487
758	J-2-437	682.60	Zone-2	0.000	731.84	482
591	J-2-438	682.50	Zone-2	0.000	731.85	483
609	J-2-439	681.00	Zone-2	0.531	731.84	498
691	J-2-439	681.56	Zone-2	0.000	731.84	492
630	J-2-44	692.00	Zone-2	0.415	731.95	391
632	J-2-441	681.80	Zone-2	0.341	731.84	490
623	J-2-442	681.20	Zone-2	0.000	731.84	496
725	J-2-443	680.86	Zone-2	0.000	731.84	499
625	J-2-444	682.12	Zone-2	0.549	731.84	487
759	J-2-445	681.50	Zone-2	0.000	731.84	493
827	J-2-446	680.00	Zone-2	0.265	731.84	507
802	J-2-448	682.00	Zone-2	0.000	731.81	488

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
875	J-2-449	680.60	Zone-2	0.000	731.81	501
605	J-2-45	690.00	Zone-2	0.000	731.95	411
876	J-2-450	681.50	Zone-2	0.247	731.80	492
880	J-2-451	680.75	Zone-2	0.510	731.79	500
882	J-2-452	680.75	Zone-2	0.000	731.79	500
881	J-2-453	680.64	Zone-2	0.738	731.79	501
879	J-2-454	680.64	Zone-2	0.378	731.79	501
878	J-2-455	680.64	Zone-2	0.321	731.79	501
877	J-2-456	680.42	Zone-2	0.321	731.79	503
885	J-2-457	681.26	Zone-2	0.000	731.79	495
883	J-2-458	681.00	Zone-2	0.000	731.79	497
650	J-2-459	681.70	Zone-2	0.000	731.80	490
627	J-2-46	690.00	Zone-2	0.208	731.95	411
884	J-2-460	681.10	Zone-2	0.586	731.79	496
3725	J-2-461	681.60	Zone-2	0.000	731.79	491
1969	J-2-462	682.27	Zone-2	0.284	731.78	485
1977	J-2-463	681.00	Zone-2	0.000	731.78	497
1980	J-2-464	680.09	Zone-2	0.302	731.78	506
1982	J-2-465	680.91	Zone-2	0.000	731.78	498
1975	J-2-466	681.11	Zone-2	0.000	731.78	496
2368	J-2-467	683.50	Zone-2	0.000	731.78	473
603	J-2-47	688.50	Zone-2	0.605	731.94	425
3084	J-2-471	684.78	Zone-2	0.000	731.78	460
1955	J-2-472	686.60	Zone-2	0.000	731.80	442
1957	J-2-473	686.70	Zone-2	0.720	731.79	441
1959	J-2-474	686.70	Zone-2	0.265	731.78	441
2020	J-2-475	686.70	Zone-2	0.360	731.78	441
2018	J-2-476	684.96	Zone-2	0.568	731.78	458
2023	J-2-477	684.96	Zone-2	0.000	731.78	458
2025	J-2-478	683.89	Zone-2	0.000	731.78	469
2016	J-2-479	683.89	Zone-2	0.568	731.78	469
667	J-2-48	688.10	Zone-2	0.360	731.94	429
910	J-2-480	682.60	Zone-2	0.983	731.78	481
911	J-2-481	683.24	Zone-2	0.000	731.78	475
1994	J-2-482	681.71	Zone-2	0.000	731.78	490
909	J-2-483	682.10	Zone-2	0.983	731.78	486
1961	J-2-484	685.85	Zone-2	0.000	731.78	450
1984	J-2-485	685.30	Zone-2	0.000	731.78	455
1986	J-2-486	684.63	Zone-2	0.549	731.78	461
1988	J-2-487	685.50	Zone-2	0.000	731.78	453
1992	J-2-488	683.81	Zone-2	0.000	731.78	470
1990	J-2-489	682.80	Zone-2	0.455	731.78	479
692	J-2-49	690.00	Zone-2	0.000	731.94	410
2014	J-2-490	684.50	Zone-2	0.000	731.78	463
2012	J-2-491	682.00	Zone-2	0.510	731.78	487
1973	J-2-492	683.50	Zone-2	0.757	731.78	473

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
1971	J-2-493	683.92	Zone-2	0.455	731.78	468
2004	J-2-494	684.50	Zone-2	0.000	731.78	463
2002	J-2-495	684.26	Zone-2	1.135	731.78	465
1998	J-2-496	684.16	Zone-2	0.889	731.78	466
2000	J-2-497	684.20	Zone-2	0.720	731.78	466
2006	J-2-498	684.42	Zone-2	0.152	731.78	464
2008	J-2-499	684.79	Zone-2	0.531	731.78	460
784	J-2-5	693.00	Zone-2	0.000	731.97	381
576	J-2-50	692.00	Zone-2	0.436	731.94	391
2010	J-2-500	685.28	Zone-2	0.000	731.78	455
3076	J-2-501	684.98	Zone-2	0.132	731.78	458
3074	J-2-502	684.38	Zone-2	0.415	731.78	464
3364	J-2-503	684.63	Zone-2	1.267	731.78	461
3366	J-2-504	684.73	Zone-2	0.000	731.78	460
3081	J-2-505	684.07	Zone-2	1.004	731.78	467
824	J-2-506	683.62	Zone-2	0.852	731.78	471
825	J-2-507	683.78	Zone-2	0.605	731.78	470
3071	J-2-508	683.95	Zone-2	0.455	731.78	468
3132	J-2-509	684.58	Zone-2	0.436	731.78	462
739	J-2-51	692.00	Zone-2	0.000	731.95	391
3134	J-2-510	685.79	Zone-2	0.397	731.78	450
3137	J-2-511	687.00	Zone-2	0.000	731.79	438
1967	J-2-512	687.27	Zone-2	0.928	731.79	436
1965	J-2-513	689.10	Zone-2	0.000	731.80	418
3714	J-2-514	689.10	Zone-2	0.000	731.85	418
3164	J-2-515	689.74	Zone-2	0.000	731.85	412
3166	J-2-516	690.81	Zone-2	0.000	731.85	402
3168	J-2-518	690.00	Zone-2	0.000	731.85	410
3170	J-2-519	690.53	Zone-2	0.928	731.85	404
664	J-2-52	692.50	Zone-2	0.000	731.96	386
2676	J-2-520	692.69	Zone-2	0.208	731.85	383
2076	J-2-521	691.50	Zone-2	0.000	731.99	396
3064	J-2-521	694.90	Zone-2	0.000	731.94	362
3062	J-2-522	692.69	Zone-2	0.889	731.91	384
2358	J-2-523	691.60	Zone-2	0.415	731.91	394
2062	J-2-524	694.32	Zone-2	0.833	731.90	368
2064	J-2-525	692.52	Zone-2	0.681	731.87	385
2360	J-2-526	691.00	Zone-2	0.189	731.85	400
2362	J-2-527	691.99	Zone-2	0.265	731.85	390
2364	J-2-528	689.50	Zone-2	0.341	731.85	414
891	J-2-529	688.53	Zone-2	0.699	731.85	424
3056	J-2-530	689.45	Zone-2	0.341	731.84	415
3054	J-2-531	688.61	Zone-2	0.436	731.84	423
3052	J-2-532	688.41	Zone-2	0.247	731.84	425
2366	J-2-533	689.11	Zone-2	0.415	731.84	418
653	J-2-54	692.20	Zone-2	0.455	731.96	389

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
886	J-2-544	688.00	Zone-2	0.815	731.84	429
887	J-2-545	685.00	Zone-2	0.492	731.83	458
822	J-2-546	688.50	Zone-2	0.455	731.84	424
888	J-2-547	689.32	Zone-2	0.378	731.84	416
889	J-2-548	691.20	Zone-2	0.341	731.85	398
890	J-2-549	691.58	Zone-2	1.004	731.86	394
740	J-2-55	691.44	Zone-2	0.568	731.94	396
649	J-2-550	688.00	Zone-2	0.378	731.84	429
864	J-2-551	687.73	Zone-2	0.000	731.84	432
2149	J-2-552	686.82	Zone-2	0.510	731.84	441
2151	J-2-553	686.16	Zone-2	0.510	731.84	447
2153	J-2-554	686.04	Zone-2	0.455	731.84	448
865	J-2-555	685.10	Zone-2	0.000	731.84	457
516	J-2-556	686.47	Zone-2	0.000	731.84	444
475	J-2-557	686.36	Zone-2	0.000	731.84	445
760	J-2-558	684.25	Zone-2	0.815	731.84	466
764	J-2-559	683.00	Zone-2	0.000	731.84	478
615	J-2-56	689.50	Zone-2	0.000	731.93	415
581	J-2-560	684.00	Zone-2	0.360	731.84	468
727	J-2-561	686.00	Zone-2	0.000	731.84	449
782	J-2-562	684.00	Zone-2	0.928	731.84	468
761	J-2-563	682.50	Zone-2	0.000	731.84	483
559	J-2-564	682.30	Zone-2	0.000	731.84	485
548	J-2-565	685.00	Zone-2	0.000	731.84	458
799	J-2-566	684.74	Zone-2	0.000	731.84	461
687	J-2-567	684.47	Zone-2	0.000	731.84	464
808	J-2-568	684.00	Zone-2	0.775	731.85	468
814	J-2-57	689.00	Zone-2	0.000	731.94	420
646	J-2-570	683.00	Zone-2	0.397	731.84	478
573	J-2-571	683.88	Zone-2	0.000	731.85	469
743	J-2-572	682.87	Zone-2	1.401	731.85	479
577	J-2-573	683.60	Zone-2	0.000	731.85	472
746	J-2-574	684.55	Zone-2	0.302	731.85	463
551	J-2-575	684.35	Zone-2	0.000	731.85	465
636	J-2-576	683.00	Zone-2	0.000	731.85	478
721	J-2-578	683.50	Zone-2	0.000	731.85	473
568	J-2-579	683.00	Zone-2	0.000	731.85	478
719	J-2-58	692.00	Zone-2	0.000	731.94	391
682	J-2-580	682.70	Zone-2	0.000	731.85	481
600	J-2-581	682.50	Zone-2	0.000	731.86	483
647	J-2-582	682.50	Zone-2	0.000	731.86	483
704	J-2-583	682.50	Zone-2	0.000	731.86	483
711	J-2-584	681.50	Zone-2	0.000	731.86	493
674	J-2-585	681.00	Zone-2	0.000	731.86	498
2278	J-2-585-1	692.21	Zone-2	0.302	731.79	387
567	J-2-586	682.60	Zone-2	0.378	731.95	483

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
705	J-2-587	681.39	Zone-2	0.208	731.95	495
744	J-2-588	681.76	Zone-2	0.000	731.95	491
661	J-2-589	682.28	Zone-2	0.000	731.95	486
789	J-2-59	691.50	Zone-2	0.360	731.93	396
771	J-2-590	683.13	Zone-2	0.302	731.95	478
586	J-2-591	683.85	Zone-2	0.397	731.95	471
621	J-2-592	682.81	Zone-2	0.549	731.95	481
791	J-2-593	683.56	Zone-2	0.473	731.95	474
776	J-2-594	684.69	Zone-2	0.415	731.95	463
598	J-2-595	685.27	Zone-2	0.000	731.96	457
788	J-2-596	686.64	Zone-2	0.284	731.96	444
803	J-2-597	691.70	Zone-2	0.510	731.97	394
656	J-2-598	687.50	Zone-2	0.000	731.98	435
714	J-2-599	685.10	Zone-2	0.000	731.97	459
694	J-2-6	693.60	Zone-2	1.098	731.96	375
641	J-2-60	691.50	Zone-2	0.455	731.92	396
718	J-2-600	694.00	Zone-2	0.000	731.97	372
655	J-2-601	692.50	Zone-2	0.473	731.97	386
783	J-2-602	692.50	Zone-2	0.000	731.97	386
742	J-2-603	688.00	Zone-2	0.321	731.96	430
666	J-2-604	686.50	Zone-2	0.000	731.95	445
706	J-2-605	685.22	Zone-2	0.681	731.95	457
710	J-2-606	684.23	Zone-2	0.247	731.95	467
684	J-2-607	685.00	Zone-2	0.625	731.95	459
753	J-2-608	687.69	Zone-2	0.000	731.95	433
569	J-2-609	683.54	Zone-2	0.000	731.95	474
631	J-2-61	689.90	Zone-2	0.815	731.92	411
593	J-2-610	689.49	Zone-2	0.605	731.95	416
722	J-2-611	689.98	Zone-2	0.625	731.95	411
565	J-2-612	691.68	Zone-2	0.397	731.95	394
766	J-2-613	692.14	Zone-2	0.360	731.95	390
602	J-2-614	688.54	Zone-2	0.605	731.95	425
686	J-2-615	687.50	Zone-2	0.000	731.95	435
677	J-2-616	690.00	Zone-2	0.681	731.95	411
633	J-2-617	693.00	Zone-2	0.000	731.95	381
604	J-2-618	694.00	Zone-2	0.000	731.95	371
589	J-2-619	687.50	Zone-2	0.397	731.95	435
628	J-2-62	690.00	Zone-2	0.000	731.91	410
571	J-2-620	689.50	Zone-2	0.000	731.96	416
546	J-2-621	692.50	Zone-2	0.000	731.97	386
777	J-2-622	691.68	Zone-2	0.000	731.95	394
726	J-2-623	695.00	Zone-2	0.000	731.95	362
629	J-2-624	695.50	Zone-2	0.000	731.95	357
607	J-2-625	694.50	Zone-2	0.000	731.95	367
665	J-2-626	695.00	Zone-2	0.000	731.95	362
550	J-2-63	692.00	Zone-2	0.718	731.91	391

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
755	J-2-64	690.50	Zone-2	0.510	731.90	405
2486	J-2-646	677.13	Zone-2	0.302	731.71	534
768	J-2-65	692.50	Zone-2	0.208	731.89	386
693	J-2-66	694.00	Zone-2	0.681	731.90	371
790	J-2-67	692.50	Zone-2	0.000	731.91	386
614	J-2-68	692.50	Zone-2	0.000	731.91	386
597	J-2-69	694.50	Zone-2	0.815	731.91	366
572	J-2-7	692.50	Zone-2	0.000	731.96	386
554	J-2-70	694.00	Zone-2	0.000	731.90	371
797	J-2-71	694.76	Zone-2	0.605	731.91	364
582	J-2-72	691.89	Zone-2	0.413	731.93	392
638	J-2-73	693.00	Zone-2	0.436	731.94	381
730	J-2-74	693.77	Zone-2	0.644	731.95	374
601	J-2-75	696.80	Zone-2	0.568	731.96	344
558	J-2-76	698.57	Zone-2	0.644	731.97	327
583	J-2-77	695.20	Zone-2	0.738	731.99	360
695	J-2-78	694.15	Zone-2	0.000	731.97	370
555	J-2-79	693.17	Zone-2	0.302	731.96	380
708	J-2-8	690.20	Zone-2	0.113	731.95	409
774	J-2-80	692.50	Zone-2	0.000	731.96	386
659	J-2-81	698.00	Zone-2	0.000	731.91	332
670	J-2-82	700.17	Zone-2	0.699	731.91	311
657	J-2-83	699.45	Zone-2	0.397	731.87	317
683	J-2-84	696.16	Zone-2	0.000	731.86	349
544	J-2-85	694.50	Zone-2	0.000	731.86	366
622	J-2-86	692.50	Zone-2	0.436	731.86	385
688	J-2-87	693.00	Zone-2	0.000	731.88	380
812	J-2-88	692.50	Zone-2	0.000	731.86	385
807	J-2-89	692.19	Zone-2	0.000	731.85	388
749	J-2-9	688.00	Zone-2	0.701	731.95	430
642	J-2-90	691.90	Zone-2	0.681	731.83	391
3606	J-2-91	693.74	Zone-2	0.000	731.83	373
3608	J-2-92	694.52	Zone-2	0.000	731.83	365
329	J-2-93	697.08	Zone-2	0.000	731.94	341
672	J-2-93	693.29	Zone-2	0.415	731.82	377
754	J-2-94	693.40	Zone-2	0.284	731.83	376
654	J-2-95	698.61	Zone-2	0.341	731.84	325
541	J-2-96	699.88	Zone-2	0.568	731.84	313
618	J-2-97	700.17	Zone-2	0.132	731.83	310
751	J-2-98	695.72	Zone-2	0.625	731.83	353
747	J-2-99	695.86	Zone-2	0.000	731.83	352
3636	J-12	682.11	Zone-2	1.968	731.72	485
3729	J-49	687.89	Zone-2	0.000	731.81	430
3732	J-50	686.49	Zone-2	0.000	731.82	444
3735	J-51	686.31	Zone-2	0.000	731.79	445
3738	J-52	675.03	Zone-2	0.000	731.79	555

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: MDD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3766	J-62	696.70	Zone-2	0.000	731.91	345
3769	J-63	696.00	Zone-2	0.000	731.88	351
3772	J-64	700.87	<None>	0.000	731.84	303
3774	J-65	688.17	Zone-2	0.000	731.73	426
4182	J-208	690.44	Zone-2	0.000	731.85	405
4279	J-245	690.23	Zone-2	0.000	731.85	407
4285	J-247	690.54	Zone-2	0.000	731.85	404
4448	J-252	673.70	<None>	0.000	731.84	569
1953	J-444	686.80	Zone-2	0.000	731.80	440
2560	J-659	686.50	Zone-2	0.302	731.83	444
2562	J-660	687.00	Zone-2	0.284	731.83	439
2564	J-661	688.10	Zone-2	0.341	731.83	428
2567	J-662	686.30	Zone-2	0.549	731.83	446
2569	J-663	686.50	Zone-2	0.000	731.83	444
2571	J-664	685.20	Zone-2	0.000	731.83	456
2573	J-665	687.20	Zone-2	0.000	731.83	437
2575	J-666	684.50	Zone-2	0.000	731.83	463

APPENDIX G

Peak Hour Demand - 2020

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
2781	J-1-1	710.78	Zone-1	0.000	756.40	446
2893	J-1-10	692.50	Zone-1	0.000	756.07	622
323	J-1-100	700.00	Zone-1	0.000	754.89	537
331	J-1-101	695.60	Zone-1	0.788	754.88	580
326	J-1-102	698.50	Zone-1	0.325	754.73	550
327	J-1-103	700.17	Zone-1	1.344	754.73	534
3030	J-1-104	701.02	Zone-1	0.000	754.73	526
3032	J-1-105	701.76	Zone-1	0.000	754.73	518
328	J-1-106	701.60	Zone-1	0.000	754.73	520
310	J-1-107	701.80	Zone-1	0.000	755.21	523
253	J-1-108	704.24	Zone-1	0.833	755.20	499
254	J-1-109	706.00	Zone-1	0.232	755.20	482
2709	J-1-11	707.80	Zone-1	0.000	756.23	474
256	J-1-110	705.20	Zone-1	0.000	755.20	489
255	J-1-111	705.90	Zone-1	0.904	755.20	482
252	J-1-112	706.25	Zone-1	0.534	755.23	479
423	J-1-113	705.46	Zone-1	0.695	755.20	487
424	J-1-114	706.30	Zone-1	0.672	755.20	479
263	J-1-115	704.15	Zone-1	0.650	755.17	499
434	J-1-116	701.65	Zone-1	0.740	755.14	524
262	J-1-117	697.35	Zone-1	0.486	755.12	565
265	J-1-118	698.57	Zone-1	0.718	755.15	554
425	J-1-119	701.80	Zone-1	0.602	755.15	522
2713	J-1-12	708.40	Zone-1	0.000	756.22	468
435	J-1-120	702.40	Zone-1	0.347	755.19	517
264	J-1-121	700.70	Zone-1	0.556	755.18	533
267	J-1-122	702.40	Zone-1	0.000	755.19	517
266	J-1-123	702.35	Zone-1	0.000	755.19	517
251	J-1-124	705.41	Zone-1	0.000	755.25	488
257	J-1-125	704.75	Zone-1	0.579	755.23	494
258	J-1-126	704.00	Zone-1	0.000	755.23	501
259	J-1-127	701.25	Zone-1	0.418	755.21	528
260	J-1-128	699.65	Zone-1	0.000	755.18	543
261	J-1-129	698.54	Zone-1	0.997	755.17	554
2711	J-1-13	707.50	Zone-1	0.000	756.22	477
426	J-1-130	698.75	Zone-1	0.000	755.18	552
268	J-1-131	700.95	Zone-1	0.579	755.22	531
269	J-1-132	700.10	Zone-1	0.556	755.23	540
427	J-1-132	701.30	Zone-1	0.000	755.22	528
270	J-1-133	700.03	Zone-1	0.000	755.23	540
250	J-1-134	707.00	Zone-1	0.000	755.31	473
248	J-1-135	705.60	Zone-1	0.000	755.46	488
246	J-1-136	705.00	Zone-1	0.000	755.58	495
438	J-1-137	705.90	Zone-1	0.000	755.78	488
241	J-1-138	708.50	Zone-1	2.243	755.88	464
242	J-1-139	708.35	Zone-1	0.000	755.85	465

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
412	J-1-14	711.50	Zone-1	1.234	756.09	436
243	J-1-140	708.05	Zone-1	1.161	755.75	467
3024	J-1-142	707.08	Zone-1	0.000	755.88	478
408	J-1-143	708.70	Zone-1	0.000	755.88	462
407	J-1-144	709.70	Zone-1	0.000	755.89	452
301	J-1-145	708.23	Zone-1	1.830	755.78	465
302	J-1-146	706.28	Zone-1	0.000	755.83	485
303	J-1-147	706.37	Zone-1	1.055	755.76	483
442	J-1-148	705.19	Zone-1	0.000	755.64	494
278	J-1-149	705.90	Zone-1	1.224	755.60	486
342	J-1-15	712.40	Zone-1	1.234	756.06	427
244	J-1-150	706.71	Zone-1	1.113	755.60	478
245	J-1-151	705.85	Zone-1	0.000	755.60	487
283	J-1-152	704.63	Zone-1	3.439	755.45	497
277	J-1-153	704.10	Zone-1	1.103	755.50	503
280	J-1-154	704.82	Zone-1	1.317	755.54	496
444	J-1-155	704.70	Zone-1	0.000	755.58	498
446	J-1-156	705.00	Zone-1	0.000	755.63	495
299	J-1-157	705.86	Zone-1	1.178	755.65	487
298	J-1-158	706.53	Zone-1	2.075	755.66	481
443	J-1-159	707.10	Zone-1	0.000	755.68	475
341	J-1-16	712.10	Zone-1	1.234	756.01	430
300	J-1-160	708.50	Zone-1	0.000	755.70	462
285	J-1-161	705.30	Zone-1	1.178	755.47	491
397	J-1-161	707.40	Zone-1	0.000	755.68	472
276	J-1-162	702.69	Zone-1	0.000	755.44	516
282	J-1-163	704.25	Zone-1	0.463	755.39	500
284	J-1-164	704.25	Zone-1	1.317	755.35	500
271	J-1-165	701.80	Zone-1	1.840	755.24	523
272	J-1-166	698.80	Zone-1	1.015	755.10	551
273	J-1-167	699.60	Zone-1	0.677	755.27	545
274	J-1-168	700.40	Zone-1	1.113	755.33	538
275	J-1-169	700.30	Zone-1	1.463	755.39	539
345	J-1-17	710.50	Zone-1	1.234	756.00	445
286	J-1-170	705.37	Zone-1	1.229	755.42	490
287	J-1-171	701.77	Zone-1	1.103	755.39	525
3717	J-1-172	700.49	Zone-1	0.000	755.46	538
3721	J-1-173	696.90	Zone-1	0.000	755.53	574
474	J-1-174	699.50	Zone-1	1.596	755.61	549
288	J-1-175	701.40	Zone-1	0.385	755.69	531
2935	J-1-176	703.83	Zone-1	0.000	755.68	507
2932	J-1-177	699.44	Zone-1	0.000	755.69	551
410	J-1-178	697.90	Zone-1	0.320	755.69	566
304	J-1-179	698.70	Zone-1	0.000	755.05	552
346	J-1-18	709.30	Zone-1	2.467	756.00	457
305	J-1-180	698.46	Zone-1	0.000	754.98	553

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
307	J-1-181	698.30	Zone-1	0.000	754.98	555
306	J-1-182	697.89	Zone-1	0.000	754.97	559
309	J-1-183	698.00	Zone-1	3.280	754.94	557
308	J-1-184	695.00	Zone-1	0.000	753.76	575
2386	J-1-185	701.16	Zone-1	0.000	756.02	537
289	J-1-186	700.10	Zone-1	0.000	755.85	546
296	J-1-187	705.89	Zone-1	0.000	755.69	487
439	J-1-188	706.53	Zone-1	0.000	755.67	481
297	J-1-189	706.53	Zone-1	0.000	755.67	481
2130	J-1-19	709.00	Zone-1	1.234	756.00	460
295	J-1-190	707.00	Zone-1	0.000	755.65	476
413	J-1-191	705.31	Zone-1	0.000	755.65	493
294	J-1-192	704.70	Zone-1	0.000	755.67	499
293	J-1-193	702.72	Zone-1	0.000	755.69	518
432	J-1-194	702.10	Zone-1	0.000	755.69	525
292	J-1-195	700.60	Zone-1	0.000	755.70	539
290	J-1-196	698.20	Zone-1	0.000	755.71	563
401	J-1-197	700.03	Zone-1	0.000	755.92	547
400	J-1-198	700.00	Zone-1	0.556	755.76	546
402	J-1-199	700.90	Zone-1	0.000	755.76	537
447	J-1-2	709.00	Zone-1	0.000	756.35	463
403	J-1-200	701.51	Zone-1	0.000	755.76	531
399	J-1-201	699.94	Zone-1	0.000	755.56	544
398	J-1-202	700.86	Zone-1	0.000	755.45	534
404	J-1-203	702.39	Zone-1	1.483	755.38	519
429	J-1-204	704.20	Zone-1	0.000	755.38	501
405	J-1-205	705.75	Zone-1	0.695	755.37	486
393	J-1-206	704.10	Zone-1	0.000	755.36	502
396	J-1-207	705.50	Zone-1	0.000	755.65	491
395	J-1-208	705.10	Zone-1	0.000	755.53	494
394	J-1-209	704.60	Zone-1	0.000	755.35	497
485	J-1-21	708.96	Zone-1	0.000	756.01	461
361	J-1-210	704.50	Zone-1	0.000	755.23	497
366	J-1-211	703.30	Zone-1	0.000	755.23	508
384	J-1-212	703.50	Zone-1	0.000	755.22	506
383	J-1-213	703.00	Zone-1	0.000	755.21	511
367	J-1-214	703.23	Zone-1	0.000	755.22	509
387	J-1-215	702.50	Zone-1	0.463	755.33	517
391	J-1-216	702.30	Zone-1	0.000	755.35	519
390	J-1-217	701.50	Zone-1	0.788	755.41	528
389	J-1-218	699.60	Zone-1	0.624	755.36	546
428	J-1-219	696.80	Zone-1	0.000	755.35	573
480	J-1-22	709.88	Zone-1	0.000	756.03	452
388	J-1-220	700.25	Zone-1	0.650	755.34	539
368	J-1-221	700.51	Zone-1	0.370	755.17	535
371	J-1-222	698.22	Zone-1	0.463	755.16	557

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
372	J-1-223	698.70	Zone-1	0.000	755.16	553
431	J-1-224	696.77	Zone-1	0.302	755.15	571
370	J-1-225	697.57	Zone-1	0.325	755.14	563
373	J-1-226	696.70	Zone-1	0.000	755.14	572
369	J-1-227	696.99	Zone-1	0.000	755.14	569
374	J-1-228	697.42	Zone-1	0.254	755.14	565
386	J-1-229	697.60	Zone-1	0.000	755.14	563
2137	J-1-23	708.17	Zone-1	0.000	756.04	469
385	J-1-230	699.30	Zone-1	0.000	755.15	547
375	J-1-231	698.87	Zone-1	0.000	755.15	551
376	J-1-232	702.40	Zone-1	0.695	755.16	516
377	J-1-233	702.50	Zone-1	0.534	755.16	515
381	J-1-234	703.70	Zone-1	0.000	755.16	504
378	J-1-235	701.50	Zone-1	0.624	755.16	525
380	J-1-236	701.20	Zone-1	0.000	755.16	528
379	J-1-237	702.10	Zone-1	0.000	755.17	519
359	J-1-238	702.50	Zone-1	0.000	755.17	515
360	J-1-239	704.30	Zone-1	0.000	755.20	498
2135	J-1-24	708.54	Zone-1	1.234	756.02	465
357	J-1-240	703.30	Zone-1	0.000	755.18	508
358	J-1-241	703.30	Zone-1	0.000	755.18	508
356	J-1-242	705.00	Zone-1	0.000	755.23	492
353	J-1-243	705.70	Zone-1	1.234	755.28	485
354	J-1-244	706.70	Zone-1	1.234	755.83	481
355	J-1-245	707.10	Zone-1	1.234	755.98	478
2390	J-1-246	708.00	Zone-1	0.000	756.08	471
351	J-1-247	703.75	Zone-1	1.234	755.27	504
350	J-1-248	703.90	Zone-1	1.234	755.29	503
436	J-1-249	705.30	Zone-1	1.234	755.28	489
3710	J-1-25	709.40	Zone-1	0.000	756.02	456
411	J-1-250	702.80	Zone-1	1.234	755.23	513
352	J-1-251	705.65	Zone-1	1.234	755.20	485
448	J-1-252	705.00	Zone-1	0.000	755.18	491
451	J-1-253	705.00	Zone-1	1.234	755.17	491
450	J-1-254	705.00	Zone-1	1.234	755.17	491
449	J-1-255	705.00	Zone-1	1.234	755.17	491
452	J-1-256	705.00	Zone-1	1.234	755.17	491
453	J-1-257	705.00	Zone-1	1.234	755.15	491
456	J-1-258	705.00	Zone-1	0.000	755.12	490
364	J-1-259	704.31	Zone-1	0.000	755.08	497
3708	J-1-26	709.50	Zone-1	0.000	756.01	455
363	J-1-260	704.00	Zone-1	0.000	755.05	500
362	J-1-261	701.75	Zone-1	0.000	755.05	522
2106	J-1-262	701.78	Zone-1	0.000	755.05	521
365	J-1-263	700.00	Zone-1	0.000	755.03	539
459	J-1-264	698.25	Zone-1	0.000	754.95	555

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
920	J-1-266	698.29	Zone-1	0.000	754.95	555
918	J-1-267	696.65	Zone-1	0.000	754.95	571
2072	J-1-268	698.29	Zone-1	0.000	754.95	555
2067	J-1-269	698.13	Zone-1	0.000	754.95	556
2139	J-1-27	709.27	Zone-1	0.000	756.09	458
917	J-1-270	696.76	Zone-1	0.000	754.95	569
2069	J-1-271	696.95	Zone-1	0.000	754.95	568
915	J-1-272	695.00	Zone-1	0.000	754.95	587
462	J-1-273	694.94	Zone-1	0.000	754.93	587
512	J-1-274	692.00	Zone-1	0.000	754.90	616
2080	J-1-275	693.53	Zone-1	0.000	754.94	601
2092	J-1-276	694.01	Zone-1	0.000	754.97	597
2095	J-1-277	693.00	Zone-1	0.949	754.98	607
2101	J-1-278	694.20	Zone-1	0.000	754.98	595
2103	J-1-279	694.00	Zone-1	0.000	754.98	597
2141	J-1-28	713.00	Zone-1	0.000	756.24	423
2099	J-1-280	695.00	Zone-1	0.000	754.99	587
2097	J-1-281	694.50	Zone-1	1.344	754.99	592
2583	J-1-282	694.94	Zone-1	0.186	754.99	588
2110	J-1-283	695.43	Zone-1	0.788	755.02	583
2113	J-1-284	693.50	Zone-1	0.000	755.03	602
2115	J-1-285	693.30	Zone-1	0.000	755.03	604
2117	J-1-286	696.05	Zone-1	0.788	755.04	577
2586	J-1-287	692.20	Zone-1	0.209	754.98	614
3092	J-1-288	690.20	Zone-1	0.232	754.97	634
409	J-1-29	713.40	Zone-1	1.234	756.29	420
2592	J-1-290	687.40	Zone-1	1.088	754.95	661
919	J-1-291	697.00	Zone-1	0.000	754.95	567
916	J-1-292	696.46	Zone-1	0.000	754.95	572
2083	J-1-295	690.00	Zone-1	1.435	754.93	635
2089	J-1-296	690.00	Zone-1	0.000	754.93	635
2087	J-1-297	689.70	Zone-1	1.251	754.93	638
2085	J-1-298	690.15	Zone-1	0.000	754.93	634
3211	J-1-299	688.45	Zone-1	0.000	754.93	651
2812	J-1-3	708.56	Zone-1	0.000	756.23	467
3705	J-1-30	712.31	Zone-1	0.000	756.29	430
3213	J-1-300	688.10	Zone-1	0.000	754.93	654
2577	J-1-301	689.55	Zone-1	1.088	754.92	640
2581	J-1-302	689.75	Zone-1	0.000	754.92	638
2579	J-1-303	688.40	Zone-1	0.000	754.91	651
440	J-1-304	690.70	Zone-1	0.000	754.90	628
2056	J-1-305	691.00	Zone-1	0.000	754.71	624
2058	J-1-306	691.00	Zone-1	0.000	754.51	622
2060	J-1-307	691.50	Zone-1	0.000	754.27	614
454	J-1-308	705.00	Zone-1	1.234	755.25	492
455	J-1-309	703.40	Zone-1	0.000	755.36	509

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
339	J-1-31	714.40	Zone-1	1.234	756.35	411
421	J-1-310	702.50	Zone-1	1.234	755.37	517
349	J-1-311	703.75	Zone-1	1.234	755.39	505
347	J-1-312	703.60	Zone-1	1.234	755.64	509
420	J-1-313	701.69	Zone-1	1.234	755.66	528
348	J-1-314	702.95	Zone-1	1.234	755.47	514
2121	J-1-315	702.06	Zone-1	0.000	755.80	526
2122	J-1-316	702.62	Zone-1	0.000	755.87	521
2133	J-1-317	703.48	Zone-1	0.000	755.87	513
473	J-1-32	711.71	Zone-1	1.234	756.06	434
2124	J-1-320	703.24	Zone-1	1.234	755.92	516
2126	J-1-321	703.12	Zone-1	1.234	755.96	517
344	J-1-322	705.00	Zone-1	1.234	755.84	498
2128	J-1-323	706.83	Zone-1	1.234	755.99	481
486	J-1-325	707.14	Zone-1	0.000	756.00	478
422	J-1-326	709.50	Zone-1	1.234	755.95	455
247	J-1-327	704.50	Zone-1	0.232	755.46	499
249	J-1-328	705.50	Zone-1	0.277	755.31	488
279	J-1-329	705.10	Zone-1	0.000	755.57	494
482	J-1-32a	715.56	Zone-1	0.000	756.07	397
476	J-1-33	713.23	Zone-1	0.000	756.06	419
281	J-1-330	704.63	Zone-1	0.302	755.45	497
382	J-1-331	702.50	Zone-1	0.370	755.19	516
392	J-1-332	703.10	Zone-1	0.232	755.35	511
406	J-1-333	703.75	Zone-1	0.000	755.35	505
430	J-1-334	703.20	Zone-1	0.881	755.35	510
437	J-1-335	705.19	Zone-1	1.463	755.64	494
338	J-1-35	709.60	Zone-1	1.234	756.06	455
337	J-1-37	713.90	Zone-1	1.234	756.20	414
340	J-1-38	714.40	Zone-1	1.234	756.20	409
3453	J-1-39	713.00	Zone-1	0.000	756.20	423
533	J-1-4	708.00	Zone-1	0.000	756.12	471
343	J-1-40	711.50	Zone-1	1.234	756.21	438
240	J-1-41	711.50	Zone-1	0.000	756.30	438
441	J-1-41	707.87	Zone-1	2.850	755.85	470
417	J-1-42	713.00	Zone-1	0.000	756.31	424
418	J-1-43	713.00	Zone-1	0.000	756.32	424
414	J-1-44	712.20	Zone-1	0.000	756.32	432
336	J-1-46	712.60	Zone-1	0.000	756.31	428
335	J-1-47	711.00	Zone-1	1.234	756.18	442
334	J-1-48	708.60	Zone-1	1.234	755.85	462
415	J-1-49	706.10	Zone-1	1.234	755.43	483
536	J-1-5	708.23	Zone-1	0.000	756.09	468
3396	J-1-50	704.66	Zone-1	0.000	755.35	496
3399	J-1-51	698.00	Zone-1	0.000	755.35	561
3401	J-1-52	698.00	Zone-1	0.000	755.35	561

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3403	J-1-53	696.00	Zone-1	0.000	755.35	581
333	J-1-56	702.80	Zone-1	0.000	755.26	513
461	J-1-57	702.00	Zone-1	0.000	755.26	521
2351	J-1-58	702.00	Zone-1	0.000	755.15	520
311	J-1-59	700.91	Zone-1	0.486	755.12	531
535	J-1-6	707.50	Zone-1	0.000	756.09	476
312	J-1-60	696.50	Zone-1	0.000	755.01	573
2354	J-1-61	696.90	Zone-1	0.000	755.15	570
526	J-1-62	696.00	Zone-1	0.000	754.99	577
921	J-1-7	706.00	Zone-1	0.000	756.08	490
320	J-1-75	701.15	Zone-1	0.556	755.09	528
318	J-1-76	701.19	Zone-1	0.302	755.07	527
319	J-1-77	701.79	Zone-1	0.347	755.08	521
419	J-1-78	701.56	Zone-1	0.000	755.08	524
317	J-1-79	701.08	Zone-1	0.672	755.04	528
534	J-1-8	701.40	Zone-1	3.804	756.07	535
316	J-1-80	696.70	Zone-1	0.881	754.96	570
315	J-1-81	695.30	Zone-1	0.509	754.96	584
314	J-1-82	695.69	Zone-1	0.602	754.98	580
313	J-1-83	696.25	Zone-1	0.000	755.00	575
433	J-1-84	698.40	Zone-1	0.000	754.99	554
525	J-1-85	695.70	Zone-1	1.158	754.97	580
524	J-1-86	694.60	Zone-1	0.393	754.95	591
529	J-1-87	695.30	Zone-1	0.000	754.95	584
522	J-1-88	694.83	Zone-1	0.765	754.94	588
523	J-1-89	695.78	Zone-1	0.325	754.94	579
923	J-1-9	697.90	Zone-1	0.000	756.07	569
527	J-1-90	695.35	Zone-1	1.412	754.96	583
528	J-1-91	694.60	Zone-1	0.000	754.95	591
530	J-1-92	694.65	Zone-1	0.881	754.95	590
531	J-1-93	696.30	Zone-1	0.556	754.95	574
2693	J-1-94	695.00	Zone-1	0.000	754.95	587
445	J-1-95	695.00	Zone-1	0.833	754.88	586
330	J-1-96	696.80	Zone-1	0.000	754.87	568
324	J-1-97	699.60	Zone-1	0.370	754.85	541
325	J-1-98	700.50	Zone-1	0.000	754.85	532
322	J-1-99	698.35	Zone-1	0.000	754.89	553
3748	J-56	695.10	Zone-1	0.000	754.96	586
3751	J-57	695.10	Zone-1	0.000	754.95	586
3754	J-58	694.60	Zone-1	0.000	754.95	591
3757	J-59	694.92	Zone-1	0.000	754.95	588
3760	J-60	694.45	Zone-1	0.000	754.95	592
3763	J-61	696.30	Zone-1	0.000	754.87	573
3910	J-119	712.61	Zone-1	0.000	756.09	425
4257	J-237	705.00	Zone-1	0.000	755.20	491
4398	J-249	707.70	<None>	0.000	755.87	471

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
685	J-2-1	692.50	Zone-2	0.000	731.51	382
716	J-2-10	689.00	Zone-2	0.000	731.48	416
611	J-2-100	694.34	Zone-2	0.000	731.69	365
668	J-2-101	691.89	Zone-2	0.904	731.69	389
579	J-2-102	694.76	Zone-2	0.509	731.71	362
689	J-2-103	690.90	Zone-2	0.463	731.66	399
658	J-2-104	695.13	Zone-2	0.972	731.69	358
736	J-2-105	693.81	Zone-2	0.000	731.69	371
553	J-2-106	695.70	Zone-2	0.624	731.71	352
703	J-2-107	696.00	Zone-2	0.788	731.73	350
3610	J-2-108	695.90	Zone-2	0.000	731.74	351
793	J-2-109	695.53	Zone-2	0.000	731.75	354
773	J-2-11	685.90	Zone-2	0.000	731.47	446
748	J-2-110	695.18	Zone-2	0.000	731.80	358
549	J-2-111	696.42	Zone-2	0.534	731.84	347
3198	J-2-112	690.20	Zone-2	0.000	731.52	404
3203	J-2-113	686.58	Zone-2	0.000	731.46	439
3201	J-2-114	687.00	Zone-2	0.000	731.43	435
3196	J-2-115	690.50	Zone-2	0.000	731.46	401
3194	J-2-116	688.25	Zone-2	0.000	731.41	422
3086	J-2-117	689.28	Zone-2	0.000	731.26	411
842	J-2-118	688.85	Zone-2	0.000	731.24	415
2679	J-2-119	687.41	Zone-2	0.000	731.21	429
786	J-2-12	685.37	Zone-2	1.158	731.47	451
2684	J-2-120	689.20	Zone-2	0.000	731.21	411
2800	J-2-123	691.00	Zone-2	0.000	731.26	394
856	J-2-126	685.22	Zone-2	0.000	731.18	450
2610	J-2-127	685.10	Zone-2	0.000	731.18	451
2617	J-2-128	685.58	Zone-2	0.486	731.18	446
3208	J-2-129	686.72	Zone-2	0.302	731.18	435
772	J-2-13	684.40	Zone-2	0.393	731.47	461
3206	J-2-130	686.70	Zone-2	0.161	731.18	435
2619	J-2-131	685.37	Zone-2	0.602	731.18	448
2869	J-2-133	687.53	Zone-2	0.833	731.17	427
2871	J-2-134F	686.46	Zone-2	0.000	731.18	438
616	J-2-14	687.00	Zone-2	0.000	731.48	435
599	J-2-15	687.50	Zone-2	0.000	731.48	430
2520	J-2-150	683.02	Zone-2	0.000	731.18	471
853	J-2-151	683.76	Zone-2	6.365	731.19	464
3633	J-2-152	680.27	Zone-2	0.000	731.18	498
3638	J-2-153	679.12	Zone-2	0.000	731.18	510
3641	J-2-154	678.44	Zone-2	0.000	731.18	516
3643	J-2-155	677.55	Zone-2	0.000	731.18	525
3645	J-2-156	677.53	Zone-2	0.000	731.18	525
3647	J-2-157	677.43	Zone-2	0.000	731.18	526
3629	J-2-158	677.47	Zone-2	0.000	731.18	526

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3627	J-2-159	678.29	Zone-2	0.000	731.18	518
619	J-2-16	693.00	Zone-2	1.181	731.52	377
3625	J-2-160	677.29	Zone-2	0.000	731.18	527
3622	J-2-161	677.25	Zone-2	0.000	731.18	528
2488	J-2-162	677.06	Zone-2	0.000	731.18	530
2514	J-2-163	677.02	Zone-2	0.672	731.18	530
843	J-2-165	679.50	Zone-2	0.000	731.19	506
2343	J-2-166	680.00	Zone-2	0.000	731.20	501
2345	J-2-167	684.89	Zone-2	0.000	731.19	453
2511	J-2-168	686.00	Zone-2	0.000	731.19	442
2509	J-2-169	682.80	Zone-2	1.251	731.19	474
676	J-2-17	694.00	Zone-2	0.000	731.51	367
2505	J-2-170	681.56	Zone-2	0.000	731.19	486
2503	J-2-171	681.97	Zone-2	1.251	731.18	482
2501	J-2-172	682.92	Zone-2	1.344	731.19	472
2480	J-2-173	679.36	Zone-2	1.181	731.18	507
3742	J-2-173A	680.19	Zone-2	0.000	731.18	499
3618	J-2-174	680.02	Zone-2	0.000	731.18	501
2498	J-2-175	679.19	Zone-2	1.483	731.18	509
3613	J-2-176	677.42	Zone-2	0.000	731.18	526
3616	J-2-177	678.17	Zone-2	0.000	731.18	519
2482	J-2-178	677.17	Zone-2	1.203	731.18	529
2484	J-2-179	676.62	Zone-2	0.138	731.18	534
2492	J-2-179A	677.97	Zone-2	1.576	731.18	521
713	J-2-18	694.50	Zone-2	0.000	731.50	362
2495	J-2-180	677.04	Zone-2	0.556	731.18	530
852	J-2-181	677.05	Zone-2	0.486	731.18	530
3651	J-2-182	675.35	Zone-2	0.000	731.18	546
3653	J-2-183	675.23	Zone-2	0.000	731.18	548
3655	J-2-184	675.23	Zone-2	0.000	731.18	548
922	J-2-185	675.20	Zone-2	1.065	731.18	548
3657	J-2-186	675.14	Zone-2	0.000	731.18	548
3659	J-2-187	674.80	Zone-2	0.000	731.18	552
3661	J-2-188	674.70	Zone-2	0.000	731.18	553
3663	J-2-189	674.20	Zone-2	0.000	731.18	558
690	J-2-19	695.60	Zone-2	0.740	731.51	351
3665	J-2-190	674.10	Zone-2	0.000	731.18	559
3046	J-2-191	687.50	Zone-2	0.000	731.22	428
3049	J-2-192	687.00	Zone-2	0.000	731.22	433
2336	J-2-193	690.00	Zone-2	0.000	731.22	403
2339	J-2-194	688.49	Zone-2	0.000	731.23	418
2334	J-2-195	689.74	Zone-2	1.181	731.24	406
2280	J-2-196	686.50	Zone-2	0.000	731.24	438
2282	J-2-197	688.39	Zone-2	0.000	731.24	419
2319	J-2-198	685.00	Zone-2	0.765	731.24	453
2317	J-2-199	682.43	Zone-2	0.000	731.24	478

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
701	J-2-2	688.00	Zone-2	0.000	731.50	426
804	J-2-20	695.50	Zone-2	0.534	731.53	353
2286	J-2-200	682.93	Zone-2	0.393	731.24	473
2284	J-2-201	685.67	Zone-2	0.534	731.24	446
2307	J-2-202	688.54	Zone-2	0.579	731.25	418
2305	J-2-203	686.70	Zone-2	0.000	731.25	436
2303	J-2-204	684.90	Zone-2	0.000	731.25	454
2312	J-2-205	684.88	Zone-2	1.390	731.25	454
895	J-2-206	690.31	Zone-2	0.000	731.26	401
2275	J-2-207	691.71	Zone-2	0.186	731.27	387
2272	J-2-208	690.24	Zone-2	0.000	731.28	402
871	J-2-209	687.90	Zone-2	0.000	731.27	424
699	J-2-21	694.70	Zone-2	0.811	731.56	361
608	J-2-210A	691.19	Zone-2	0.093	731.24	392
896	J-2-210B	687.40	Zone-2	0.000	731.27	429
542	J-2-210C	691.41	Zone-2	0.347	731.24	390
2300	J-2-211	685.45	Zone-2	0.000	731.26	448
2325	J-2-212	684.40	Zone-2	0.000	731.26	459
2322	J-2-213	683.47	Zone-2	1.737	731.27	468
2298	J-2-214	683.97	Zone-2	0.000	731.26	463
2296	J-2-215	679.34	Zone-2	0.000	731.26	508
563	J-2-215b	695.00	Zone-2	0.186	731.56	358
698	J-2-215g	692.50	Zone-2	0.000	731.75	384
2294	J-2-216	679.53	Zone-2	0.740	731.25	506
2292	J-2-217	679.66	Zone-2	1.020	731.25	505
2290	J-2-218	679.94	Zone-2	1.088	731.25	502
2288	J-2-219	678.72	Zone-2	0.556	731.24	514
770	J-2-22	695.00	Zone-2	0.881	731.53	358
863	J-2-220	678.00	Zone-2	0.000	731.24	521
3668	J-2-221	678.10	Zone-2	0.000	731.24	520
3670	J-2-222	675.85	Zone-2	0.000	731.24	542
3678	J-2-223	675.66	Zone-2	0.000	731.24	544
3672	J-2-224	676.26	Zone-2	0.000	731.24	538
3674	J-2-225	679.24	Zone-2	0.000	731.24	509
848	J-2-226	678.66	Zone-2	0.000	731.24	515
3683	J-2-227	673.98	Zone-2	0.000	731.24	560
3681	J-2-228	675.14	Zone-2	0.000	731.24	549
592	J-2-23	695.00	Zone-2	0.000	731.53	358
3688	J-2-230	673.73	Zone-2	0.000	731.24	563
3690	J-2-231	674.17	Zone-2	0.000	731.24	559
3692	J-2-232	674.13	Zone-2	0.000	731.24	559
3694	J-2-233	674.13	Zone-2	0.000	731.24	559
3697	J-2-234	673.25	Zone-2	0.000	731.24	568
3701	J-2-235	673.25	Zone-2	0.000	731.24	568
3699	J-2-236	674.44	Zone-2	0.000	731.24	556
2446	J-2-237	691.21	Zone-2	0.000	731.29	392

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3686	J-2-237	673.00	Zone-2	0.000	731.24	570
518	J-2-238	688.80	Zone-2	0.000	731.32	416
872	J-2-239	687.63	Zone-2	1.181	731.30	427
741	J-2-24	696.00	Zone-2	0.650	731.53	348
892	J-2-240	685.74	Zone-2	1.435	731.28	446
873	J-2-241	684.72	Zone-2	1.203	731.28	456
899	J-2-242	685.65	Zone-2	0.695	731.28	447
893	J-2-243	686.93	Zone-2	1.969	731.27	434
894	J-2-244	690.24	Zone-2	0.000	731.28	402
2328	J-2-245	683.40	Zone-2	0.000	731.28	469
897	J-2-246	682.65	Zone-2	0.418	731.30	476
874	J-2-247	684.00	Zone-2	0.000	731.31	463
845	J-2-248	677.00	Zone-2	0.000	731.33	532
663	J-2-249	688.80	Zone-2	0.000	731.37	417
756	J-2-25	696.00	Zone-2	0.000	731.53	348
2267	J-2-250	688.72	Zone-2	0.000	731.37	417
2264	J-2-251	685.13	Zone-2	0.347	731.37	453
906	J-2-252	683.72	Zone-2	0.000	731.37	466
907	J-2-253	682.22	Zone-2	1.065	731.37	481
908	J-2-254	682.94	Zone-2	0.624	731.37	474
2262	J-2-255	684.11	Zone-2	0.000	731.37	463
3179	J-2-256	680.44	Zone-2	1.020	731.37	498
3182	J-2-257	681.56	Zone-2	0.302	731.36	487
3184	J-2-258	678.61	Zone-2	1.020	731.36	516
2878	J-2-259	677.60	Zone-2	0.788	731.37	526
564	J-2-26	696.00	Zone-2	0.000	731.53	348
3188	J-2-260	675.57	Zone-2	0.000	731.36	546
2874	J-2-265	676.21	Zone-2	0.509	731.36	540
2255	J-2-266	675.20	Zone-2	0.556	731.37	550
519	J-2-267	680.00	Zone-2	0.486	731.39	503
520	J-2-268	680.90	Zone-2	0.347	731.39	494
732	J-2-269	688.00	Zone-2	1.065	731.40	425
547	J-2-27	696.00	Zone-2	0.856	731.53	348
811	J-2-270	682.50	Zone-2	0.418	731.45	479
752	J-2-271	681.35	Zone-2	0.000	731.44	490
2250	J-2-272	679.30	Zone-2	0.509	731.43	510
557	J-2-273	679.50	Zone-2	0.000	731.42	508
640	J-2-274	680.21	Zone-2	0.463	731.41	501
2253	J-2-275	680.91	Zone-2	0.000	731.41	494
2257	J-2-276	680.58	Zone-2	0.000	731.40	497
2260	J-2-277	681.10	Zone-2	0.000	731.40	492
595	J-2-278	680.07	Zone-2	1.042	731.42	503
800	J-2-279	679.42	Zone-2	0.000	731.42	509
560	J-2-28	696.00	Zone-2	0.000	731.54	348
585	J-2-280	679.74	Zone-2	0.000	731.42	506
795	J-2-281	679.96	Zone-2	0.000	731.42	504

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
702	J-2-282	680.01	Zone-2	0.672	731.41	503
731	J-2-283	684.50	Zone-2	0.000	731.47	460
613	J-2-284	682.87	Zone-2	0.000	731.45	475
680	J-2-285	683.09	Zone-2	0.370	731.45	473
648	J-2-286	681.80	Zone-2	0.000	731.44	486
644	J-2-287	680.50	Zone-2	0.463	731.44	499
588	J-2-288	680.00	Zone-2	0.000	731.44	503
762	J-2-289	682.50	Zone-2	0.325	731.44	479
794	J-2-29	696.00	Zone-2	0.000	731.55	348
816	J-2-290	681.68	Zone-2	0.418	731.44	487
681	J-2-291	679.72	Zone-2	0.000	731.44	506
574	J-2-292	679.11	Zone-2	0.534	731.44	512
817	J-2-293	679.42	Zone-2	0.347	731.43	509
801	J-2-294	677.00	Zone-2	0.579	731.40	532
662	J-2-295	676.38	Zone-2	0.209	731.38	538
2243	J-2-296	676.38	Zone-2	0.904	731.37	538
2246	J-2-297	675.46	Zone-2	0.000	731.37	547
712	J-2-298	676.09	Zone-2	0.418	731.36	541
700	J-2-299	675.42	Zone-2	0.000	731.36	547
787	J-2-3	689.60	Zone-2	0.000	731.50	410
750	J-2-30	696.00	Zone-2	0.000	731.56	348
624	J-2-300	676.40	Zone-2	0.000	731.35	538
2156	J-2-301	676.47	Zone-2	0.000	731.35	537
2173	J-2-302	676.10	Zone-2	0.000	731.35	541
2175	J-2-303	675.65	Zone-2	0.000	731.35	545
2158	J-2-304	674.68	Zone-2	1.065	731.35	555
2160	J-2-305	673.14	Zone-2	0.000	731.35	570
2170	J-2-306	671.27	Zone-2	0.602	731.35	588
2168	J-2-307	670.44	Zone-2	0.000	731.35	596
2166	J-2-308	670.91	Zone-2	0.556	731.35	591
2164	J-2-309	671.34	Zone-2	0.000	731.35	587
570	J-2-31	695.00	Zone-2	0.347	731.58	358
2162	J-2-310	671.71	Zone-2	0.161	731.35	584
844	J-2-311	672.46	Zone-2	1.065	731.34	576
2415	J-2-312	673.33	Zone-2	1.065	731.34	568
2417	J-2-313	674.13	Zone-2	0.000	731.34	560
2419	J-2-314	674.34	Zone-2	0.000	731.34	558
847	J-2-315	674.01	Zone-2	1.088	731.34	561
3173	J-2-316	675.09	Zone-2	0.000	731.35	551
3175	J-2-317	675.62	Zone-2	0.393	731.35	545
2876	J-2-318	675.25	Zone-2	0.881	731.35	549
798	J-2-319	674.65	Zone-2	0.695	731.35	555
697	J-2-32	696.50	Zone-2	0.000	731.54	343
767	J-2-320	686.91	Zone-2	0.000	731.48	436
810	J-2-321	686.91	Zone-2	0.000	731.47	436
779	J-2-322	688.14	Zone-2	0.833	731.46	424

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
562	J-2-323	686.09	Zone-2	0.486	731.43	444
806	J-2-324	685.47	Zone-2	0.370	731.41	450
723	J-2-325	682.68	Zone-2	0.000	731.39	477
671	J-2-326	682.09	Zone-2	0.650	731.39	482
735	J-2-327	680.20	Zone-2	0.000	731.38	501
809	J-2-328	679.16	Zone-2	0.254	731.38	511
839	J-2-328	692.50	Zone-2	0.000	731.25	379
556	J-2-329	677.50	Zone-2	0.209	731.37	527
840	J-2-329	690.30	Zone-2	0.949	731.23	401
724	J-2-33	696.00	Zone-2	0.695	731.53	348
578	J-2-330	677.21	Zone-2	0.000	731.36	530
612	J-2-331	676.50	Zone-2	0.833	731.35	537
696	J-2-332	676.51	Zone-2	0.000	731.35	537
584	J-2-333	677.00	Zone-2	0.602	731.35	532
580	J-2-334	675.05	Zone-2	0.232	731.35	551
709	J-2-335	675.05	Zone-2	0.000	731.35	551
775	J-2-336	672.89	Zone-2	0.347	731.35	572
837	J-2-337	671.08	Zone-2	1.020	731.35	590
2238	J-2-338	670.87	Zone-2	0.000	731.35	592
2241	J-2-339	671.65	Zone-2	0.000	731.35	584
545	J-2-34	695.50	Zone-2	0.000	731.51	352
2222	J-2-340	670.73	Zone-2	0.000	731.35	593
2234	J-2-341	672.33	Zone-2	0.000	731.35	578
2231	J-2-342	671.56	Zone-2	0.579	731.35	585
2229	J-2-343	671.92	Zone-2	0.000	731.35	582
2226	J-2-344	671.92	Zone-2	0.556	731.35	582
838	J-2-345	672.01	Zone-2	0.347	731.35	581
2224	J-2-346	671.65	Zone-2	0.579	731.35	584
2236	J-2-347	672.61	Zone-2	0.000	731.35	575
715	J-2-348	674.08	Zone-2	0.000	731.35	560
543	J-2-349	674.46	Zone-2	0.695	731.35	557
637	J-2-35	695.00	Zone-2	0.441	731.51	357
757	J-2-350	674.84	Zone-2	0.000	731.35	553
617	J-2-351	675.83	Zone-2	0.000	731.35	543
862	J-2-351	693.41	Zone-2	0.000	731.25	370
707	J-2-352	676.90	Zone-2	0.000	731.35	533
737	J-2-353	676.90	Zone-2	0.000	731.35	533
678	J-2-354	677.49	Zone-2	0.000	731.35	527
805	J-2-355	677.22	Zone-2	0.765	731.35	530
780	J-2-356	687.50	Zone-2	1.203	731.49	431
596	J-2-357	681.80	Zone-2	0.000	731.44	486
769	J-2-358	679.89	Zone-2	0.000	731.40	504
781	J-2-359	679.57	Zone-2	0.000	731.40	507
720	J-2-36	695.50	Zone-2	0.000	731.51	352
590	J-2-360	680.00	Zone-2	1.251	731.39	503
734	J-2-361	680.33	Zone-2	0.000	731.39	500

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
673	J-2-362	681.46	Zone-2	0.624	731.39	489
561	J-2-363	680.95	Zone-2	0.000	731.39	494
813	J-2-364	680.23	Zone-2	0.000	731.39	501
745	J-2-365	679.88	Zone-2	0.000	731.37	504
635	J-2-366	679.17	Zone-2	1.435	731.37	511
792	J-2-367	679.45	Zone-2	1.644	731.37	508
639	J-2-368	678.76	Zone-2	0.000	731.37	515
765	J-2-369	678.40	Zone-2	0.000	731.37	518
660	J-2-37	693.90	Zone-2	0.000	731.63	369
643	J-2-370	677.80	Zone-2	0.718	731.37	524
517	J-2-371	678.39	Zone-2	0.370	731.38	519
796	J-2-372	679.64	Zone-2	0.000	731.40	507
552	J-2-373	680.50	Zone-2	0.370	731.40	498
675	J-2-374	680.50	Zone-2	0.000	731.40	498
738	J-2-375	680.20	Zone-2	0.000	731.40	501
620	J-2-376	680.40	Zone-2	0.000	731.40	499
868	J-2-377	677.45	Zone-2	0.347	731.36	528
2185	J-2-378	674.83	Zone-2	0.650	731.35	553
2206	J-2-379	676.34	Zone-2	0.000	731.35	538
763	J-2-38	693.00	Zone-2	0.000	731.74	379
870	J-2-380	676.40	Zone-2	0.232	731.35	538
869	J-2-381	677.50	Zone-2	0.602	731.35	527
2183	J-2-381	678.86	Zone-2	0.000	731.35	514
2181	J-2-382	677.74	Zone-2	0.000	731.35	525
2178	J-2-383	676.29	Zone-2	0.856	731.35	539
830	J-2-384	675.98	Zone-2	0.000	731.35	542
2187	J-2-385	673.66	Zone-2	1.135	731.34	565
2208	J-2-386	674.15	Zone-2	0.277	731.34	560
2216	J-2-387	674.03	Zone-2	0.000	731.34	561
2189	J-2-388	673.07	Zone-2	1.297	731.34	570
2191	J-2-389	673.11	Zone-2	0.000	731.34	570
634	J-2-39	692.50	Zone-2	0.000	731.91	386
2203	J-2-390	673.71	Zone-2	1.113	731.34	564
2220	J-2-391	670.00	Zone-2	0.000	731.34	600
2201	J-2-392	672.85	Zone-2	0.000	731.34	572
2199	J-2-393	672.27	Zone-2	0.718	731.34	578
2193	J-2-394	672.19	Zone-2	0.463	731.34	579
900	J-2-395	690.83	Zone-2	0.695	731.23	395
2195	J-2-395	672.00	Zone-2	0.949	731.34	581
901	J-2-396	691.00	Zone-2	0.209	731.23	394
2197	J-2-396	672.86	Zone-2	1.274	731.34	572
902	J-2-397	691.07	Zone-2	0.000	731.23	393
2474	J-2-397	673.84	Zone-2	0.000	731.34	563
903	J-2-398	691.95	Zone-2	0.302	731.23	384
2212	J-2-398	673.62	Zone-2	0.000	731.34	565
778	J-2-4	690.00	Zone-2	0.000	731.50	406

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
729	J-2-40	692.00	Zone-2	0.000	731.79	389
3143	J-2-404	678.50	Zone-2	0.904	731.34	517
2458	J-2-405	677.50	Zone-2	1.274	731.34	527
3140	J-2-409	670.00	Zone-2	1.181	731.34	600
815	J-2-41	692.50	Zone-2	2.339	731.75	384
3147	J-2-410	676.20	Zone-2	0.000	731.34	540
733	J-2-411a	692.17	Zone-2	0.000	731.87	389
610	J-2-412	682.50	Zone-2	0.000	731.37	478
566	J-2-413	682.00	Zone-2	0.926	731.37	483
575	J-2-415	684.00	Zone-2	0.602	731.35	463
679	J-2-416	682.50	Zone-2	0.000	731.37	478
912	J-2-417	682.50	Zone-2	0.881	731.35	478
913	J-2-418	681.50	Zone-2	0.000	731.35	488
2027	J-2-419	682.30	Zone-2	0.000	731.35	480
645	J-2-42	692.50	Zone-2	0.000	731.75	384
2048	J-2-420	682.60	Zone-2	0.000	731.35	477
2029	J-2-421	680.25	Zone-2	1.135	731.35	500
2044	J-2-422	680.30	Zone-2	0.000	731.35	500
2046	J-2-423	677.25	Zone-2	0.000	731.34	529
2031	J-2-424	677.15	Zone-2	0.325	731.34	530
2054	J-2-425	676.30	Zone-2	0.000	731.34	539
2033	J-2-426	676.35	Zone-2	0.325	731.34	538
2035	J-2-427	677.80	Zone-2	0.000	731.34	524
2037	J-2-428	675.00	Zone-2	0.997	731.34	551
829	J-2-429	676.70	Zone-2	1.020	731.34	535
717	J-2-43	692.50	Zone-2	0.000	731.74	384
2039	J-2-430	677.00	Zone-2	0.972	731.34	532
2050	J-2-431	676.50	Zone-2	0.000	731.35	537
785	J-2-431c	682.27	Zone-2	0.000	731.37	480
2041	J-2-432	676.55	Zone-2	0.000	731.35	536
728	J-2-433	682.50	Zone-2	0.370	731.35	478
652	J-2-434	681.54	Zone-2	0.000	731.35	487
587	J-2-435	681.84	Zone-2	0.534	731.35	485
594	J-2-436	682.11	Zone-2	0.579	731.35	482
758	J-2-437	682.60	Zone-2	0.000	731.35	477
591	J-2-438	682.50	Zone-2	0.000	731.36	478
609	J-2-439	681.00	Zone-2	0.650	731.35	493
691	J-2-439	681.56	Zone-2	0.000	731.35	487
630	J-2-44	692.00	Zone-2	0.509	731.66	388
632	J-2-441	681.80	Zone-2	0.418	731.35	485
623	J-2-442	681.20	Zone-2	0.000	731.35	491
725	J-2-443	680.86	Zone-2	0.000	731.35	494
625	J-2-444	682.12	Zone-2	0.672	731.35	482
759	J-2-445	681.50	Zone-2	0.000	731.35	488
827	J-2-446	680.00	Zone-2	0.325	731.35	503
802	J-2-448	682.00	Zone-2	0.000	731.33	483

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
875	J-2-449	680.60	Zone-2	0.000	731.32	496
605	J-2-45	690.00	Zone-2	0.000	731.67	408
876	J-2-450	681.50	Zone-2	0.302	731.31	487
880	J-2-451	680.75	Zone-2	0.624	731.30	495
882	J-2-452	680.75	Zone-2	0.000	731.30	495
881	J-2-453	680.64	Zone-2	0.904	731.30	496
879	J-2-454	680.64	Zone-2	0.463	731.30	496
878	J-2-455	680.64	Zone-2	0.393	731.30	496
877	J-2-456	680.42	Zone-2	0.393	731.30	498
885	J-2-457	681.26	Zone-2	0.000	731.30	490
883	J-2-458	681.00	Zone-2	0.000	731.30	492
650	J-2-459	681.70	Zone-2	0.000	731.31	486
627	J-2-46	690.00	Zone-2	0.254	731.67	408
884	J-2-460	681.10	Zone-2	0.718	731.30	491
3725	J-2-461	681.60	Zone-2	0.000	731.29	486
1969	J-2-462	682.27	Zone-2	0.347	731.29	480
1977	J-2-463	681.00	Zone-2	0.000	731.29	492
1980	J-2-464	680.09	Zone-2	0.370	731.29	501
1982	J-2-465	680.91	Zone-2	0.000	731.29	493
1975	J-2-466	681.11	Zone-2	0.000	731.29	491
2368	J-2-467	683.50	Zone-2	0.000	731.29	468
603	J-2-47	688.50	Zone-2	0.740	731.68	423
3084	J-2-471	684.78	Zone-2	0.000	731.29	455
1955	J-2-472	686.60	Zone-2	0.000	731.31	438
1957	J-2-473	686.70	Zone-2	0.881	731.29	436
1959	J-2-474	686.70	Zone-2	0.325	731.29	436
2020	J-2-475	686.70	Zone-2	0.441	731.29	436
2018	J-2-476	684.96	Zone-2	0.695	731.29	453
2023	J-2-477	684.96	Zone-2	0.000	731.29	453
2025	J-2-478	683.89	Zone-2	0.000	731.29	464
2016	J-2-479	683.89	Zone-2	0.695	731.29	464
667	J-2-48	688.10	Zone-2	0.441	731.69	427
910	J-2-480	682.60	Zone-2	1.203	731.29	476
911	J-2-481	683.24	Zone-2	0.000	731.29	470
1994	J-2-482	681.71	Zone-2	0.000	731.29	485
909	J-2-483	682.10	Zone-2	1.203	731.29	481
1961	J-2-484	685.85	Zone-2	0.000	731.29	445
1984	J-2-485	685.30	Zone-2	0.000	731.29	450
1986	J-2-486	684.63	Zone-2	0.672	731.29	457
1988	J-2-487	685.50	Zone-2	0.000	731.29	448
1992	J-2-488	683.81	Zone-2	0.000	731.29	465
1990	J-2-489	682.80	Zone-2	0.556	731.29	475
692	J-2-49	690.00	Zone-2	0.000	731.75	409
2014	J-2-490	684.50	Zone-2	0.000	731.29	458
2012	J-2-491	682.00	Zone-2	0.624	731.29	482
1973	J-2-492	683.50	Zone-2	0.926	731.29	468

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
1971	J-2-493	683.92	Zone-2	0.556	731.29	464
2004	J-2-494	684.50	Zone-2	0.000	731.29	458
2002	J-2-495	684.26	Zone-2	1.390	731.29	460
1998	J-2-496	684.16	Zone-2	1.088	731.29	461
2000	J-2-497	684.20	Zone-2	0.881	731.29	461
2006	J-2-498	684.42	Zone-2	0.186	731.29	459
2008	J-2-499	684.79	Zone-2	0.650	731.29	455
784	J-2-5	693.00	Zone-2	0.000	731.50	377
576	J-2-50	692.00	Zone-2	0.534	731.77	389
2010	J-2-500	685.28	Zone-2	0.000	731.29	450
3076	J-2-501	684.98	Zone-2	0.161	731.29	453
3074	J-2-502	684.38	Zone-2	0.509	731.29	459
3364	J-2-503	684.63	Zone-2	1.551	731.29	457
3366	J-2-504	684.73	Zone-2	0.000	731.29	456
3081	J-2-505	684.07	Zone-2	1.229	731.29	462
824	J-2-506	683.62	Zone-2	1.042	731.29	467
825	J-2-507	683.78	Zone-2	0.740	731.29	465
3071	J-2-508	683.95	Zone-2	0.556	731.29	463
3132	J-2-509	684.58	Zone-2	0.534	731.29	457
739	J-2-51	692.00	Zone-2	0.000	731.79	389
3134	J-2-510	685.79	Zone-2	0.486	731.29	445
3137	J-2-511	687.00	Zone-2	0.000	731.29	434
1967	J-2-512	687.27	Zone-2	1.135	731.30	431
1965	J-2-513	689.10	Zone-2	0.000	731.31	413
3714	J-2-514	689.10	Zone-2	0.000	731.49	415
3164	J-2-515	689.74	Zone-2	0.000	731.49	409
3166	J-2-516	690.81	Zone-2	0.000	731.49	398
3168	J-2-518	690.00	Zone-2	0.000	731.49	406
3170	J-2-519	690.53	Zone-2	1.135	731.49	401
664	J-2-52	692.50	Zone-2	0.000	731.82	385
2676	J-2-520	692.69	Zone-2	0.254	731.49	380
2076	J-2-521	691.50	Zone-2	0.000	731.95	396
3064	J-2-521	694.90	Zone-2	0.000	731.77	361
3062	J-2-522	692.69	Zone-2	1.088	731.71	382
2358	J-2-523	691.60	Zone-2	0.509	731.69	392
2062	J-2-524	694.32	Zone-2	1.020	731.65	365
2064	J-2-525	692.52	Zone-2	0.833	731.56	382
2360	J-2-526	691.00	Zone-2	0.232	731.51	396
2362	J-2-527	691.99	Zone-2	0.325	731.51	387
2364	J-2-528	689.50	Zone-2	0.418	731.49	411
891	J-2-529	688.53	Zone-2	0.856	731.49	420
3056	J-2-530	689.45	Zone-2	0.418	731.47	411
3054	J-2-531	688.61	Zone-2	0.534	731.45	419
3052	J-2-532	688.41	Zone-2	0.302	731.44	421
2366	J-2-533	689.11	Zone-2	0.509	731.44	414
653	J-2-54	692.20	Zone-2	0.556	731.86	388

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
886	J-2-544	688.00	Zone-2	0.997	731.43	425
887	J-2-545	685.00	Zone-2	0.602	731.41	454
822	J-2-546	688.50	Zone-2	0.556	731.43	420
888	J-2-547	689.32	Zone-2	0.463	731.46	412
889	J-2-548	691.20	Zone-2	0.418	731.48	394
890	J-2-549	691.58	Zone-2	1.229	731.51	391
740	J-2-55	691.44	Zone-2	0.695	731.83	395
649	J-2-550	688.00	Zone-2	0.463	731.39	425
864	J-2-551	687.73	Zone-2	0.000	731.37	427
2149	J-2-552	686.82	Zone-2	0.624	731.37	436
2151	J-2-553	686.16	Zone-2	0.624	731.36	442
2153	J-2-554	686.04	Zone-2	0.556	731.36	444
865	J-2-555	685.10	Zone-2	0.000	731.36	453
516	J-2-556	686.47	Zone-2	0.000	731.36	439
475	J-2-557	686.36	Zone-2	0.000	731.36	440
760	J-2-558	684.25	Zone-2	0.997	731.36	461
764	J-2-559	683.00	Zone-2	0.000	731.35	473
615	J-2-56	689.50	Zone-2	0.000	731.78	414
581	J-2-560	684.00	Zone-2	0.441	731.35	463
727	J-2-561	686.00	Zone-2	0.000	731.35	444
782	J-2-562	684.00	Zone-2	1.135	731.35	463
761	J-2-563	682.50	Zone-2	0.000	731.35	478
559	J-2-564	682.30	Zone-2	0.000	731.35	480
548	J-2-565	685.00	Zone-2	0.000	731.36	454
799	J-2-566	684.74	Zone-2	0.000	731.36	456
687	J-2-567	684.47	Zone-2	0.000	731.36	459
808	J-2-568	684.00	Zone-2	0.949	731.36	463
814	J-2-57	689.00	Zone-2	0.000	731.76	419
646	J-2-570	683.00	Zone-2	0.486	731.36	473
573	J-2-571	683.88	Zone-2	0.000	731.36	465
743	J-2-572	682.87	Zone-2	1.715	731.36	475
577	J-2-573	683.60	Zone-2	0.000	731.36	467
746	J-2-574	684.55	Zone-2	0.370	731.36	458
551	J-2-575	684.35	Zone-2	0.000	731.36	460
636	J-2-576	683.00	Zone-2	0.000	731.36	473
721	J-2-578	683.50	Zone-2	0.000	731.36	468
568	J-2-579	683.00	Zone-2	0.000	731.36	473
719	J-2-58	692.00	Zone-2	0.000	731.77	389
682	J-2-580	682.70	Zone-2	0.000	731.37	476
600	J-2-581	682.50	Zone-2	0.000	731.37	478
647	J-2-582	682.50	Zone-2	0.000	731.37	478
704	J-2-583	682.50	Zone-2	0.000	731.37	478
711	J-2-584	681.50	Zone-2	0.000	731.37	488
674	J-2-585	681.00	Zone-2	0.000	731.37	493
2278	J-2-585-1	692.21	Zone-2	0.370	731.24	382
567	J-2-586	682.60	Zone-2	0.463	731.45	478

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
705	J-2-587	681.39	Zone-2	0.254	731.45	490
744	J-2-588	681.76	Zone-2	0.000	731.45	486
661	J-2-589	682.28	Zone-2	0.000	731.45	481
789	J-2-59	691.50	Zone-2	0.441	731.82	395
771	J-2-590	683.13	Zone-2	0.370	731.45	473
586	J-2-591	683.85	Zone-2	0.486	731.46	466
621	J-2-592	682.81	Zone-2	0.672	731.45	476
791	J-2-593	683.56	Zone-2	0.579	731.45	469
776	J-2-594	684.69	Zone-2	0.509	731.45	458
598	J-2-595	685.27	Zone-2	0.000	731.45	452
788	J-2-596	686.64	Zone-2	0.347	731.45	439
803	J-2-597	691.70	Zone-2	0.624	731.47	389
656	J-2-598	687.50	Zone-2	0.000	731.48	430
714	J-2-599	685.10	Zone-2	0.000	731.46	454
694	J-2-6	693.60	Zone-2	1.344	731.50	371
641	J-2-60	691.50	Zone-2	0.556	731.79	394
718	J-2-600	694.00	Zone-2	0.000	731.50	367
655	J-2-601	692.50	Zone-2	0.579	731.50	382
783	J-2-602	692.50	Zone-2	0.000	731.49	382
742	J-2-603	688.00	Zone-2	0.393	731.48	426
666	J-2-604	686.50	Zone-2	0.000	731.48	440
706	J-2-605	685.22	Zone-2	0.833	731.47	453
710	J-2-606	684.23	Zone-2	0.302	731.47	462
684	J-2-607	685.00	Zone-2	0.765	731.47	455
753	J-2-608	687.69	Zone-2	0.000	731.48	429
569	J-2-609	683.54	Zone-2	0.000	731.48	469
631	J-2-61	689.90	Zone-2	0.997	731.78	410
593	J-2-610	689.49	Zone-2	0.740	731.48	411
722	J-2-611	689.98	Zone-2	0.765	731.48	406
565	J-2-612	691.68	Zone-2	0.486	731.48	390
766	J-2-613	692.14	Zone-2	0.441	731.48	385
602	J-2-614	688.54	Zone-2	0.740	731.48	420
686	J-2-615	687.50	Zone-2	0.000	731.48	430
677	J-2-616	690.00	Zone-2	0.833	731.48	406
633	J-2-617	693.00	Zone-2	0.000	731.49	377
604	J-2-618	694.00	Zone-2	0.000	731.50	367
589	J-2-619	687.50	Zone-2	0.486	731.47	430
628	J-2-62	690.00	Zone-2	0.000	731.77	409
571	J-2-620	689.50	Zone-2	0.000	731.49	411
546	J-2-621	692.50	Zone-2	0.000	731.49	382
777	J-2-622	691.68	Zone-2	0.000	731.49	390
726	J-2-623	695.00	Zone-2	0.000	731.50	357
629	J-2-624	695.50	Zone-2	0.000	731.50	352
607	J-2-625	694.50	Zone-2	0.000	731.50	362
665	J-2-626	695.00	Zone-2	0.000	731.50	357
550	J-2-63	692.00	Zone-2	0.879	731.77	389

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
755	J-2-64	690.50	Zone-2	0.624	731.77	404
2486	J-2-646	677.13	Zone-2	0.370	731.18	529
768	J-2-65	692.50	Zone-2	0.254	731.77	384
693	J-2-66	694.00	Zone-2	0.833	731.78	370
790	J-2-67	692.50	Zone-2	0.000	731.79	385
614	J-2-68	692.50	Zone-2	0.000	731.79	385
597	J-2-69	694.50	Zone-2	0.997	731.79	365
572	J-2-7	692.50	Zone-2	0.000	731.50	382
554	J-2-70	694.00	Zone-2	0.000	731.78	370
797	J-2-71	694.76	Zone-2	0.740	731.81	363
582	J-2-72	691.89	Zone-2	0.506	731.82	391
638	J-2-73	693.00	Zone-2	0.534	731.84	380
730	J-2-74	693.77	Zone-2	0.788	731.86	373
601	J-2-75	696.80	Zone-2	0.695	731.89	343
558	J-2-76	698.57	Zone-2	0.788	731.91	326
583	J-2-77	695.20	Zone-2	0.904	731.97	360
695	J-2-78	694.15	Zone-2	0.000	731.90	369
555	J-2-79	693.17	Zone-2	0.370	731.87	379
708	J-2-8	690.20	Zone-2	0.138	731.50	404
774	J-2-80	692.50	Zone-2	0.000	731.87	385
659	J-2-81	698.00	Zone-2	0.000	731.81	331
670	J-2-82	700.17	Zone-2	0.856	731.81	310
657	J-2-83	699.45	Zone-2	0.486	731.76	316
683	J-2-84	696.16	Zone-2	0.000	731.75	348
544	J-2-85	694.50	Zone-2	0.000	731.75	365
622	J-2-86	692.50	Zone-2	0.534	731.74	384
688	J-2-87	693.00	Zone-2	0.000	731.76	379
812	J-2-88	692.50	Zone-2	0.000	731.75	384
807	J-2-89	692.19	Zone-2	0.000	731.74	387
749	J-2-9	688.00	Zone-2	0.859	731.48	426
642	J-2-90	691.90	Zone-2	0.833	731.73	390
3606	J-2-91	693.74	Zone-2	0.000	731.73	372
3608	J-2-92	694.52	Zone-2	0.000	731.73	364
329	J-2-93	697.08	Zone-2	0.000	731.87	340
672	J-2-93	693.29	Zone-2	0.509	731.72	376
754	J-2-94	693.40	Zone-2	0.347	731.73	375
654	J-2-95	698.61	Zone-2	0.418	731.73	324
541	J-2-96	699.88	Zone-2	0.695	731.72	312
618	J-2-97	700.17	Zone-2	0.161	731.71	309
751	J-2-98	695.72	Zone-2	0.765	731.69	352
747	J-2-99	695.86	Zone-2	0.000	731.69	351
3636	J-12	682.11	Zone-2	2.409	731.18	480
3729	J-49	687.89	Zone-2	0.000	731.27	425
3732	J-50	686.49	Zone-2	0.000	731.29	438
3735	J-51	686.31	Zone-2	0.000	731.24	440
3738	J-52	675.03	Zone-2	0.000	731.24	550

City of Spuce Grove Water System
FlexTable: Junction Table
Active Scenario: PHD-2021 Water System

ID	Label	Elevation (m)	Zone	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
3766	J-62	696.70	Zone-2	0.000	731.83	344
3769	J-63	696.00	Zone-2	0.000	731.78	350
3772	J-64	700.87	<None>	0.000	731.72	302
3774	J-65	688.17	Zone-2	0.000	731.21	421
4182	J-208	690.44	Zone-2	0.000	731.49	402
4279	J-245	690.23	Zone-2	0.000	731.49	404
4285	J-247	690.54	Zone-2	0.000	731.49	401
4448	J-252	673.70	<None>	0.000	731.34	564
1953	J-444	686.80	Zone-2	0.000	731.31	436
2560	J-659	686.50	Zone-2	0.370	731.36	439
2562	J-660	687.00	Zone-2	0.347	731.36	434
2564	J-661	688.10	Zone-2	0.418	731.36	423
2567	J-662	686.30	Zone-2	0.672	731.36	441
2569	J-663	686.50	Zone-2	0.000	731.36	439
2571	J-664	685.20	Zone-2	0.000	731.36	452
2573	J-665	687.20	Zone-2	0.000	731.36	432
2575	J-666	684.50	Zone-2	0.000	731.36	459

APPENDIX H

Maximum Day Plus Fire Flow Demand - 2020

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-41	Zone-1	True	300.000	350.000	350.000	425
J-1-138	Zone-1	True	300.000	350.000	350.000	393
J-1-139	Zone-1	True	300.000	350.000	350.000	300
J-1-150	Zone-1	True	300.000	350.000	350.000	378
J-1-151	Zone-1	True	300.000	350.000	350.000	398
J-1-136	Zone-1	True	100.000	285.576	350.000	140
J-1-327	Zone-1	True	100.000	265.520	350.000	151
J-1-328	Zone-1	True	100.000	283.759	350.000	155
J-1-124	Zone-1	True	100.000	339.567	350.000	140
J-1-112	Zone-1	True	100.000	326.451	350.000	140
J-1-108	Zone-1	True	100.000	350.000	350.000	256
J-1-109	Zone-1	True	100.000	327.228	350.000	140
J-1-111	Zone-1	True	100.000	337.196	350.000	140
J-1-110	Zone-1	True	100.000	327.903	350.000	140
J-1-125	Zone-1	True	100.000	293.810	350.000	140
J-1-126	Zone-1	True	100.000	180.895	350.000	140
J-1-127	Zone-1	True	100.000	350.000	350.000	197
J-1-128	Zone-1	True	100.000	350.000	350.000	178
J-1-129	Zone-1	True	100.000	319.018	350.000	140
J-1-117	Zone-1	True	100.000	315.635	350.000	140
J-1-115	Zone-1	True	100.000	313.049	350.000	140
J-1-121	Zone-1	True	100.000	350.000	350.000	179
J-1-118	Zone-1	True	100.000	320.748	350.000	140
J-1-123	Zone-1	True	100.000	230.238	350.000	140
J-1-122	Zone-1	True	100.000	288.226	350.000	140
J-1-131	Zone-1	True	100.000	350.000	350.000	162
J-1-132	Zone-1	True	100.000	350.000	350.000	238
J-1-133	Zone-1	True	300.000	423.493	500.000	140
J-1-165	Zone-1	True	300.000	350.000	350.000	378
J-1-166	Zone-1	True	300.000	350.000	350.000	360
J-1-167	Zone-1	True	300.000	350.000	350.000	344
J-1-168	Zone-1	True	300.000	350.000	350.000	353
J-1-162	Zone-1	True	300.000	338.323	350.000	140
J-1-153	Zone-1	True	300.000	345.509	350.000	140
J-1-149	Zone-1	True	300.000	350.000	350.000	394
J-1-329	Zone-1	True	300.000	350.000	350.000	391
J-1-154	Zone-1	True	300.000	350.000	350.000	385
J-1-330	Zone-1	True	300.000	349.986	350.000	140
J-1-163	Zone-1	True	300.000	350.000	350.000	145
J-1-152	Zone-1	True	300.000	350.000	350.000	379
J-1-164	Zone-1	True	300.000	350.000	350.000	367
J-1-161	Zone-1	True	300.000	350.000	350.000	352
J-1-170	Zone-1	True	300.000	350.000	350.000	334
J-1-171	Zone-1	True	300.000	350.000	350.000	354
J-1-186	Zone-1	True	100.000	350.000	350.000	267

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-196	Zone-1	True	100.000	204.498	350.000	140
J-1-195	Zone-1	True	100.000	214.111	350.000	140
J-1-193	Zone-1	True	100.000	223.775	350.000	140
J-1-192	Zone-1	True	100.000	266.298	350.000	140
J-1-187	Zone-1	True	100.000	216.028	350.000	140
J-1-189	Zone-1	True	100.000	207.451	350.000	140
J-1-146	Zone-1	True	300.000	350.000	350.000	399
J-1-147	Zone-1	True	300.000	350.000	350.000	199
J-1-179	Zone-1	True	300.000	490.648	500.000	140
J-1-180	Zone-1	True	300.000	321.469	500.000	140
J-1-182	Zone-1	True	300.000	471.975	500.000	141
J-1-181	Zone-1	True	300.000	373.194	500.000	140
J-1-184	Zone-1	True	100.000	272.060	350.000	140
J-1-107	Zone-1	True	100.000	350.000	350.000	297
J-1-59	Zone-1	True	100.000	350.000	350.000	254
J-1-60	Zone-1	True	100.000	350.000	350.000	194
J-1-83	Zone-1	True	100.000	350.000	350.000	156
J-1-82	Zone-1	True	100.000	349.207	350.000	151
J-1-81	Zone-1	True	100.000	340.679	350.000	181
J-1-80	Zone-1	True	100.000	332.854	350.000	179
J-1-79	Zone-1	True	100.000	336.728	350.000	140
J-1-76	Zone-1	True	100.000	350.000	350.000	145
J-1-77	Zone-1	True	100.000	288.248	350.000	140
J-1-75	Zone-1	True	100.000	350.000	350.000	184
J-1-99	Zone-1	True	100.000	302.839	350.000	160
J-1-100	Zone-1	True	100.000	135.661	350.000	140
J-1-97	Zone-1	True	100.000	288.684	350.000	161
J-1-98	Zone-1	True	100.000	152.288	350.000	140
J-1-102	Zone-1	True	100.000	250.541	350.000	172
J-1-103	Zone-1	True	100.000	162.546	350.000	156
J-1-96	Zone-1	True	100.000	298.471	350.000	156
J-1-101	Zone-1	True	100.000	293.495	350.000	140
J-1-56	Zone-1	True	300.000	464.388	500.000	140
J-1-48	Zone-1	True	300.000	350.000	350.000	347
J-1-47	Zone-1	True	300.000	350.000	350.000	374
J-1-46	Zone-1	True	300.000	350.000	350.000	411
J-1-37	Zone-1	True	300.000	350.000	350.000	291
J-1-35	Zone-1	True	300.000	350.000	350.000	362
J-1-31	Zone-1	True	300.000	350.000	350.000	399
J-1-16	Zone-1	True	300.000	350.000	350.000	235
J-1-15	Zone-1	True	300.000	350.000	350.000	226
J-1-40	Zone-1	True	300.000	350.000	350.000	257
J-1-322	Zone-1	True	300.000	350.000	350.000	218
J-1-17	Zone-1	True	300.000	350.000	350.000	289
J-1-18	Zone-1	True	300.000	350.000	350.000	286

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-312	Zone-1	True	300.000	350.000	350.000	277
J-1-314	Zone-1	True	300.000	350.000	350.000	158
J-1-311	Zone-1	True	300.000	350.000	350.000	239
J-1-248	Zone-1	True	300.000	350.000	350.000	227
J-1-247	Zone-1	True	300.000	350.000	350.000	214
J-1-251	Zone-1	True	300.000	329.566	350.000	140
J-1-243	Zone-1	True	300.000	350.000	350.000	239
J-1-244	Zone-1	True	300.000	321.295	350.000	140
J-1-245	Zone-1	True	300.000	350.000	350.000	253
J-1-242	Zone-1	True	300.000	350.000	350.000	228
J-1-240	Zone-1	True	300.000	350.000	350.000	169
J-1-238	Zone-1	True	300.000	350.000	350.000	210
J-1-239	Zone-1	True	300.000	321.413	350.000	140
J-1-210	Zone-1	True	300.000	350.000	350.000	236
J-1-261	Zone-1	True	300.000	350.000	350.000	190
J-1-260	Zone-1	True	300.000	322.322	350.000	140
J-1-263	Zone-1	True	300.000	350.000	350.000	203
J-1-211	Zone-1	True	100.000	350.000	350.000	216
J-1-214	Zone-1	True	100.000	350.000	350.000	222
J-1-221	Zone-1	True	100.000	350.000	350.000	198
J-1-227	Zone-1	True	100.000	350.000	350.000	228
J-1-225	Zone-1	True	100.000	311.845	350.000	140
J-1-222	Zone-1	True	100.000	277.219	350.000	145
J-1-223	Zone-1	True	100.000	133.815	350.000	140
J-1-226	Zone-1	True	100.000	182.895	350.000	140
J-1-228	Zone-1	True	100.000	301.068	350.000	142
J-1-231	Zone-1	True	100.000	282.024	350.000	144
J-1-232	Zone-1	True	100.000	297.856	350.000	140
J-1-233	Zone-1	True	100.000	278.129	350.000	152
J-1-235	Zone-1	True	100.000	279.684	350.000	140
J-1-237	Zone-1	True	100.000	301.108	350.000	140
J-1-236	Zone-1	True	100.000	157.983	350.000	140
J-1-234	Zone-1	True	100.000	116.192	350.000	140
J-1-331	Zone-1	True	100.000	286.009	350.000	140
J-1-213	Zone-1	True	100.000	290.415	350.000	140
J-1-212	Zone-1	True	100.000	212.868	350.000	140
J-1-230	Zone-1	True	100.000	127.109	350.000	140
J-1-229	Zone-1	True	100.000	153.688	350.000	140
J-1-215	Zone-1	True	100.000	338.807	350.000	140
J-1-220	Zone-1	True	100.000	250.689	350.000	140
J-1-218	Zone-1	True	100.000	221.995	350.000	140
J-1-217	Zone-1	True	100.000	338.500	350.000	140
J-1-216	Zone-1	True	100.000	333.515	350.000	140
J-1-332	Zone-1	True	100.000	218.540	350.000	146
J-1-206	Zone-1	True	100.000	242.188	350.000	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-209	Zone-1	True	300.000	322.214	350.000	140
J-1-207	Zone-1	True	300.000	301.091	350.000	140
J-1-202	Zone-1	True	100.000	346.419	350.000	140
J-1-201	Zone-1	True	100.000	346.201	350.000	140
J-1-198	Zone-1	True	100.000	350.000	350.000	193
J-1-197	Zone-1	True	100.000	350.000	350.000	330
J-1-199	Zone-1	True	100.000	196.944	350.000	146
J-1-200	Zone-1	True	100.000	147.677	350.000	140
J-1-203	Zone-1	True	100.000	170.236	350.000	140
J-1-205	Zone-1	True	100.000	158.792	350.000	140
J-1-333	Zone-1	True	100.000	124.658	350.000	140
J-1-143	Zone-1	True	300.000	350.000	350.000	204
J-1-29	Zone-1	True	300.000	350.000	350.000	389
J-1-250	Zone-1	True	300.000	350.000	350.000	149
J-1-14	Zone-1	True	300.000	350.000	350.000	157
J-1-191	Zone-1	True	100.000	279.677	350.000	157
J-1-44	Zone-1	True	300.000	350.000	350.000	290
J-1-49	Zone-1	True	300.000	350.000	350.000	286
J-1-42	Zone-1	True	300.000	350.000	350.000	411
J-1-43	Zone-1	True	100.000	350.000	350.000	413
J-1-78	Zone-1	True	100.000	224.805	350.000	140
J-1-313	Zone-1	True	300.000	350.000	350.000	312
J-1-310	Zone-1	True	300.000	350.000	350.000	155
J-1-113	Zone-1	True	100.000	116.768	350.000	140
J-1-114	Zone-1	True	100.000	143.881	350.000	140
J-1-119	Zone-1	True	100.000	241.656	350.000	140
J-1-130	Zone-1	True	100.000	266.861	350.000	140
J-1-132	Zone-1	True	100.000	172.890	350.000	140
J-1-219	Zone-1	True	100.000	158.359	350.000	140
J-1-204	Zone-1	True	100.000	127.608	350.000	140
J-1-334	Zone-1	True	100.000	159.498	350.000	140
J-1-224	Zone-1	True	100.000	274.976	350.000	140
J-1-194	Zone-1	True	100.000	136.351	350.000	140
J-1-84	Zone-1	True	100.000	258.002	350.000	140
J-1-116	Zone-1	True	100.000	238.342	350.000	140
J-1-120	Zone-1	True	100.000	282.103	350.000	140
J-1-249	Zone-1	True	300.000	350.000	350.000	159
J-1-335	Zone-1	True	300.000	350.000	350.000	200
J-1-137	Zone-1	True	300.000	350.000	350.000	404
J-1-188	Zone-1	True	100.000	207.369	350.000	140
J-1-304	Zone-1	True	100.000	350.000	350.000	168
J-1-41	Zone-1	True	300.000	350.000	350.000	342
J-1-148	Zone-1	True	300.000	350.000	350.000	373
J-1-95	Zone-1	True	100.000	305.572	350.000	157
J-1-2	Zone-1	True	300.000	350.000	350.000	457

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-252	Zone-1	True	300.000	338.217	350.000	140
J-1-255	Zone-1	True	300.000	350.000	350.000	143
J-1-256	Zone-1	True	300.000	350.000	350.000	198
J-1-257	Zone-1	True	300.000	350.000	350.000	194
J-1-308	Zone-1	True	300.000	350.000	350.000	155
J-1-309	Zone-1	True	300.000	350.000	350.000	209
J-1-258	Zone-1	True	300.000	350.000	350.000	184
J-1-264	Zone-1	True	100.000	132.507	350.000	140
J-1-57	Zone-1	True	100.000	350.000	350.000	283
J-1-273	Zone-1	True	100.000	350.000	350.000	204
J-1-32	Zone-1	True	300.000	350.000	350.000	340
J-1-33	Zone-1	True	300.000	350.000	350.000	325
J-1-22	Zone-1	True	300.000	350.000	350.000	279
J-1-32a	Zone-1	True	300.000	350.000	350.000	311
J-1-21	Zone-1	True	300.000	350.000	350.000	253
J-1-325	Zone-1	True	300.000	350.000	350.000	287
J-1-274	Zone-1	True	100.000	350.000	350.000	239
J-1-88	Zone-1	True	100.000	333.724	350.000	170
J-1-89	Zone-1	True	100.000	216.620	350.000	140
J-1-86	Zone-1	True	100.000	331.629	350.000	153
J-1-85	Zone-1	True	100.000	335.072	350.000	140
J-1-62	Zone-1	True	100.000	341.682	350.000	140
J-1-90	Zone-1	True	100.000	282.292	350.000	140
J-1-91	Zone-1	True	100.000	301.485	350.000	157
J-1-87	Zone-1	True	100.000	218.334	350.000	140
J-1-92	Zone-1	True	100.000	259.499	350.000	156
J-1-93	Zone-1	True	100.000	227.941	350.000	140
J-1-4	Zone-1	True	300.000	350.000	350.000	443
J-1-8	Zone-1	True	100.000	350.000	350.000	487
J-1-6	Zone-1	True	100.000	350.000	350.000	441
J-1-5	Zone-1	True	300.000	350.000	350.000	438
J-1-272	Zone-1	True	100.000	350.000	350.000	205
J-1-292	Zone-1	True	100.000	192.616	350.000	158
J-1-270	Zone-1	True	100.000	173.465	350.000	142
J-1-267	Zone-1	True	100.000	164.195	350.000	156
J-1-291	Zone-1	True	100.000	137.920	350.000	140
J-1-266	Zone-1	True	100.000	128.554	350.000	140
J-1-7	Zone-1	True	100.000	350.000	350.000	449
J-1-9	Zone-1	True	100.000	350.000	350.000	517
J-1-305	Zone-1	True	100.000	330.882	350.000	145
J-1-306	Zone-1	True	100.000	284.440	350.000	145
J-1-307	Zone-1	True	100.000	247.640	350.000	140
J-1-269	Zone-1	True	100.000	161.663	350.000	142
J-1-271	Zone-1	True	100.000	174.029	350.000	140
J-1-268	Zone-1	True	100.000	143.193	350.000	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-275	Zone-1	True	100.000	350.000	350.000	243
J-1-295	Zone-1	True	100.000	331.520	350.000	140
J-1-298	Zone-1	True	100.000	324.225	350.000	140
J-1-297	Zone-1	True	100.000	264.074	350.000	140
J-1-296	Zone-1	True	100.000	263.839	350.000	140
J-1-276	Zone-1	True	100.000	350.000	350.000	250
J-1-277	Zone-1	True	100.000	350.000	350.000	248
J-1-281	Zone-1	True	100.000	350.000	350.000	227
J-1-280	Zone-1	True	100.000	336.146	350.000	140
J-1-278	Zone-1	True	100.000	297.857	350.000	140
J-1-279	Zone-1	True	100.000	301.794	350.000	140
J-1-262	Zone-1	True	300.000	350.000	350.000	203
J-1-283	Zone-1	True	100.000	350.000	350.000	192
J-1-284	Zone-1	True	100.000	289.988	350.000	140
J-1-285	Zone-1	True	100.000	290.704	350.000	140
J-1-286	Zone-1	True	100.000	350.000	350.000	184
J-1-315	Zone-1	True	300.000	350.000	350.000	320
J-1-316	Zone-1	True	300.000	350.000	350.000	341
J-1-320	Zone-1	True	300.000	350.000	350.000	366
J-1-321	Zone-1	True	300.000	350.000	350.000	394
J-1-323	Zone-1	True	300.000	350.000	350.000	382
J-1-19	Zone-1	True	300.000	350.000	350.000	372
J-1-24	Zone-1	True	300.000	350.000	350.000	386
J-1-23	Zone-1	True	300.000	350.000	350.000	399
J-1-27	Zone-1	True	300.000	350.000	350.000	406
J-1-28	Zone-1	True	300.000	350.000	350.000	383
J-1-58	Zone-1	True	100.000	350.000	350.000	175
J-1-61	Zone-1	True	100.000	163.983	350.000	140
J-1-185	Zone-1	True	100.000	350.000	350.000	465
J-1-246	Zone-1	True	300.000	350.000	350.000	407
J-1-301	Zone-1	True	100.000	293.786	350.000	142
J-1-303	Zone-1	True	100.000	296.079	350.000	140
J-1-302	Zone-1	True	100.000	221.289	350.000	140
J-1-282	Zone-1	True	100.000	350.000	350.000	209
J-1-287	Zone-1	True	100.000	311.735	350.000	140
J-1-290	Zone-1	True	100.000	235.245	350.000	140
J-1-94	Zone-1	True	100.000	218.780	350.000	140
J-1-11	Zone-1	True	300.000	350.000	350.000	457
J-1-13	Zone-1	True	300.000	302.200	350.000	140
J-1-12	Zone-1	True	300.000	350.000	350.000	439
J-1-1	Zone-1	True	300.000	350.000	350.000	446
J-1-3	Zone-1	True	300.000	350.000	350.000	452
J-1-10	Zone-1	True	100.000	350.000	350.000	538
J-1-142	Zone-1	True	300.000	350.000	350.000	410
J-1-104	Zone-1	True	100.000	138.769	350.000	147

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)
J-1-288	Zone-1	True	100.000	258.713	350.000	140
J-1-299	Zone-1	True	100.000	272.536	350.000	140
J-1-300	Zone-1	True	100.000	256.758	350.000	140
J-1-50	Zone-1	True	300.000	350.000	350.000	288
J-1-51	Zone-1	True	300.000	350.000	350.000	174
J-1-52	Zone-1	True	300.000	350.000	350.000	154
J-1-53	Zone-1	True	300.000	344.135	350.000	140
J-1-26	Zone-1	True	300.000	350.000	350.000	204
J-1-25	Zone-1	True	300.000	350.000	350.000	229
J-56	Zone-1	True	100.000	279.208	350.000	140
J-57	Zone-1	True	100.000	270.012	350.000	140
J-58	Zone-1	True	100.000	269.522	350.000	140
J-59	Zone-1	True	100.000	235.672	350.000	147
J-60	Zone-1	True	100.000	231.508	350.000	140
J-61	Zone-1	True	100.000	289.326	350.000	140
J-119	Zone-1	True	300.000	350.000	350.000	363
J-237	Zone-1	True	300.000	350.000	350.000	168
J-249	<None>	True	100.000	350.000	350.000	402
J-1-140	Zone-1	False	300.000	264.376	350.000	140
J-1-135	Zone-1	False	100.000	48.052	350.000	140
J-1-134	Zone-1	False	100.000	45.472	350.000	140
J-1-169	Zone-1	False	300.000	289.093	350.000	140
J-1-175	Zone-1	False	300.000	240.098	350.000	140
J-1-190	Zone-1	False	100.000	4.625	350.000	144
J-1-158	Zone-1	False	300.000	232.214	350.000	140
J-1-157	Zone-1	False	300.000	232.326	350.000	140
J-1-160	Zone-1	False	300.000	272.422	350.000	140
J-1-145	Zone-1	False	300.000	287.460	350.000	140
J-1-183	Zone-1	False	300.000	133.493	500.000	140
J-1-106	Zone-1	False	100.000	96.339	350.000	140
J-1-38	Zone-1	False	300.000	252.587	350.000	140
J-1-241	Zone-1	False	300.000	168.728	350.000	140
J-1-259	Zone-1	False	300.000	266.268	350.000	140
J-1-208	Zone-1	False	300.000	257.918	350.000	140
J-1-161	Zone-1	False	300.000	257.613	350.000	140
J-1-144	Zone-1	False	300.000	269.583	350.000	140
J-1-178	Zone-1	False	100.000	86.075	350.000	140
J-1-326	Zone-1	False	300.000	270.154	350.000	140
J-1-159	Zone-1	False	300.000	181.642	350.000	140
J-1-155	Zone-1	False	300.000	186.374	350.000	140
J-1-156	Zone-1	False	300.000	182.568	350.000	140
J-1-254	Zone-1	False	300.000	266.601	350.000	140
J-1-253	Zone-1	False	300.000	266.218	350.000	140
J-1-174	Zone-1	False	300.000	172.274	350.000	140
J-1-317	Zone-1	False	300.000	224.673	350.000	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-1-177	Zone-1	False	100.000	98.031	350.000	140	140
J-1-176	Zone-1	False	300.000	161.966	350.000	140	140
J-1-105	Zone-1	False	100.000	93.210	350.000	140	140
J-1-39	Zone-1	False	300.000	157.072	350.000	140	140
J-1-30	Zone-1	False	300.000	233.705	350.000	140	140
J-1-172	Zone-1	False	300.000	166.806	350.000	140	140
J-1-173	Zone-1	False	300.000	155.714	350.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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Pressure (Residual Lower Limit) (kPa)
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City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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City of Spuce Grove Water System

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-2021 Water System

Pressure (Residual Lower Limit) (kPa)
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APPENDIX I

Maximum Day Plus Fire Flow Demand - 2025

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2025-MDD+FF-5yrs growth

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-1-265	Zone-1	True	100.000	298.652	500.000	140	140
J-1-317	Zone-1	True	300.000	311.767	350.000	140	140
J-1-319	<None>	True	100.000	333.330	500.000	140	140
J-1-320	Zone-1	True	100.000	344.831	500.000	196	140
J-1-321	Zone-1	True	100.000	344.051	500.000	214	140
J-1-69	Zone-1	True	300.000	345.324	500.000	240	140
J-1-70	Zone-1	True	300.000	345.235	500.000	213	140
J-1-71	<None>	True	300.000	347.103	350.000	175	140
J-1-72	<None>	True	300.000	346.996	350.000	158	140
J-1-73	<None>	True	300.000	346.917	350.000	141	140
J-1-74	<None>	True	300.000	333.243	350.000	140	140
J-2-135	<None>	True	100.000	232.976	500.000	154	140
J-2-136	<None>	True	100.000	210.897	500.000	140	140
J-2-137	<None>	True	100.000	221.107	500.000	140	140
J-2-138	<None>	True	100.000	230.584	500.000	140	140
J-2-139	<None>	True	100.000	219.527	500.000	140	140
J-2-140	<None>	True	100.000	218.003	500.000	140	140
J-2-141	Zone-2	True	100.000	226.785	500.000	140	140
J-2-142	<None>	True	100.000	250.421	500.000	159	140
J-2-143	<None>	True	100.000	225.110	500.000	140	140
J-2-144	<None>	True	100.000	217.579	500.000	140	140
J-2-145	<None>	True	100.000	212.335	500.000	140	140
J-2-146	<None>	True	100.000	230.832	500.000	140	140
J-2-147	<None>	True	100.000	213.104	500.000	140	140
J-2-148	<None>	True	100.000	198.898	500.000	140	140
J-2-149	Zone-2	True	100.000	246.338	500.000	219	140
J-2-183	Zone-2	True	100.000	211.369	500.000	140	140
J-2-184	Zone-2	True	100.000	210.609	500.000	140	140
J-2-185	Zone-2	True	100.000	242.859	500.000	310	140
J-2-189	Zone-2	True	100.000	150.874	500.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2025-MDD+FF-5yrs growth

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-190	Zone-2	True	100.000	229.835	500.000	140	140
J-2-399	<None>	True	100.000	191.383	500.000	140	140
J-2-400	<None>	True	100.000	182.011	500.000	140	140
J-2-401	<None>	True	100.000	228.857	500.000	148	140
J-2-402	<None>	True	100.000	224.851	500.000	140	140
J-2-403	<None>	True	100.000	235.735	500.000	140	140
J-2-405	Zone-2	True	100.000	238.247	500.000	242	140
J-2-406	<None>	True	100.000	265.454	500.000	140	140
J-2-407	<None>	True	100.000	266.628	500.000	174	140
J-2-408	<None>	True	100.000	266.780	500.000	218	140
J-2-411	Zone-2	True	100.000	238.822	500.000	293	140
J-2-429	Zone-2	True	100.000	240.927	500.000	233	140
J-2-446	Zone-2	True	100.000	241.131	500.000	273	140
J-2-447	Zone-2	True	100.000	240.931	500.000	241	140
J-2-468	<None>	True	100.000	268.082	500.000	179	140
J-2-469	Zone-2	True	100.000	240.960	500.000	276	140
J-2-469	Zone-2	True	100.000	241.433	500.000	237	140
J-2-470	Zone-2	True	100.000	241.703	500.000	238	140
J-2-471	Zone-2	True	100.000	242.215	500.000	173	140
J-66	<None>	True	100.000	257.181	500.000	305	140
J-67	<None>	True	100.000	256.813	500.000	313	140
J-68	<None>	True	100.000	255.269	500.000	163	140
J-69	<None>	True	100.000	242.819	500.000	140	140
J-70	<None>	True	100.000	253.524	500.000	140	140
J-71	<None>	True	100.000	216.649	500.000	140	140
J-72	<None>	True	100.000	231.759	500.000	140	140
J-73	<None>	True	100.000	252.734	500.000	188	140
J-74	<None>	True	100.000	252.555	500.000	218	140
J-75	<None>	True	100.000	252.451	500.000	224	140
J-76	<None>	True	100.000	253.326	500.000	219	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2025-MDD+FF-5yrs growth

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-77	<None>	True	100.000	232.724	500.000	140	140
J-80	<None>	True	100.000	253.879	500.000	241	140
J-81	<None>	True	100.000	254.122	500.000	256	140
J-84	<None>	True	100.000	256.543	500.000	308	140
J-85	<None>	True	100.000	255.395	500.000	273	140
J-86	<None>	True	100.000	255.062	500.000	269	140
J-87	<None>	True	100.000	254.559	500.000	280	140
J-89	<None>	True	100.000	224.397	500.000	140	140
J-90	<None>	False	100.000	(N/A)	500.000	(N/A)	140
J-91	<None>	True	100.000	338.605	500.000	178	140
J-92	<None>	True	100.000	338.282	500.000	178	140
J-93	<None>	True	100.000	342.823	500.000	195	140
J-94	<None>	True	100.000	349.128	500.000	180	140
J-101	<None>	False	100.000	(N/A)	500.000	(N/A)	140
J-102	<None>	True	300.000	345.007	350.000	240	140
J-104	<None>	True	100.000	309.434	500.000	140	140
J-106	<None>	False	100.000	(N/A)	500.000	(N/A)	140
J-107	<None>	True	300.000	301.109	350.000	173	140
J-108	<None>	True	100.000	336.725	500.000	189	140
J-118	<None>	True	100.000	350.984	500.000	144	140
J-120	<None>	True	100.000	330.085	500.000	140	140
J-125	<None>	True	100.000	335.735	500.000	140	140
J-139	<None>	True	100.000	182.456	500.000	140	140
J-191	<None>	True	100.000	350.433	500.000	141	140
J-192	<None>	True	100.000	344.331	500.000	201	140
J-193	<None>	True	100.000	340.665	500.000	172	140
J-194	<None>	True	100.000	340.816	500.000	215	140
J-195	<None>	True	100.000	326.468	500.000	140	140
J-196	<None>	True	100.000	336.162	500.000	146	140
J-197	<None>	True	100.000	312.158	500.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2025-MDD+FF-5yrs growth

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-209	<None>	True	100.000	241.551	500.000	151	140
J-210	<None>	True	100.000	236.853	500.000	156	140
J-211	<None>	True	100.000	217.062	500.000	140	140
J-212	<None>	True	100.000	196.360	500.000	140	140
J-213	<None>	True	100.000	194.696	500.000	140	140
J-214	<None>	True	100.000	228.507	500.000	140	140
J-215	<None>	True	100.000	226.639	500.000	163	140
J-216	<None>	True	100.000	210.579	500.000	140	140
J-217	<None>	True	100.000	222.575	500.000	140	140
J-218	<None>	True	100.000	202.167	500.000	140	140
J-219	<None>	True	100.000	226.925	500.000	140	140
J-220	<None>	True	100.000	234.699	500.000	140	140
J-225	<None>	True	100.000	296.262	500.000	140	140
J-226	<None>	True	100.000	310.240	500.000	140	140
J-227	<None>	True	100.000	275.611	500.000	140	140
J-232	<None>	True	100.000	265.469	500.000	140	140
J-233	<None>	True	100.000	224.563	500.000	140	140
J-238	<None>	True	100.000	300.127	500.000	140	140
J-239	<None>	True	100.000	301.924	500.000	140	140
J-240	<None>	True	100.000	304.731	500.000	140	140
J-281	Zone-1	True	100.000	133.126	500.000	140	140
J-347	Zone-1	True	100.000	250.685	500.000	140	140

APPENDIX J

Maximum Day Plus Fire Flow Demand - 2035

City of Spuce Grove Water System

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2035-MDD+FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-97	<None>	True	300.000	430.290	500.000	140	140
J-98	<None>	True	300.000	394.446	500.000	140	140
J-99	<None>	True	300.000	384.049	500.000	140	140
J-104	<None>	True	300.000	500.000	500.000	275	140
J-105	<None>	True	300.000	462.999	500.000	140	140
J-109	<None>	True	300.000	500.000	500.000	357	140
J-110	<None>	True	300.000	500.000	500.000	354	140
J-111	<None>	True	300.000	500.000	500.000	342	140
J-129	<None>	True	300.000	500.000	500.000	284	140
J-130	<None>	True	300.000	500.000	500.000	280	140
J-131	<None>	True	300.000	500.000	500.000	226	140
J-132	<None>	True	300.000	500.000	500.000	169	140
J-138	<None>	True	300.000	391.154	500.000	140	140
J-140	<None>	True	300.000	436.367	500.000	140	140
J-163	<None>	True	300.000	500.000	500.000	162	140
J-164	<None>	True	300.000	458.284	500.000	140	140
J-165	<None>	True	300.000	426.730	500.000	140	140
J-166	<None>	True	300.000	392.654	500.000	140	140
J-1-318	Zone-1	False	300.000	(N/A)	500.000	(N/A)	140
J-1-325	Zone-1	False	300.000	(N/A)	500.000	(N/A)	140
J-1-324	Zone-1	False	300.000	(N/A)	500.000	(N/A)	140
J-1-321	Zone-1	False	300.000	(N/A)	500.000	(N/A)	140
J-1-323	Zone-1	False	300.000	(N/A)	500.000	(N/A)	140
J-1-319	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-78	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-79	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-82	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-83	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-133	<None>	False	300.000	(N/A)	500.000	(N/A)	140
J-134	<None>	False	300.000	(N/A)	500.000	(N/A)	140

APPENDIX K

Maximum Day Plus Fire Flow Demand - 2045

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-1-161	Zone-1	True	300.000	350.000	350.000	342	140
J-1-184	Zone-1	True	300.000	350.000	350.000	222	140
J-1-207	Zone-1	True	300.000	350.000	350.000	341	140
J-1-208	Zone-1	True	300.000	350.000	350.000	283	140
J-1-209	Zone-1	True	300.000	350.000	350.000	307	140
J-1-210	Zone-1	True	300.000	350.000	350.000	344	140
J-1-238	Zone-1	True	300.000	350.000	350.000	323	140
J-1-239	Zone-1	True	300.000	350.000	350.000	294	140
J-1-240	Zone-1	True	300.000	350.000	350.000	274	140
J-1-241	Zone-1	False	300.000	(N/A)	350.000	(N/A)	140
J-1-242	Zone-1	True	300.000	350.000	350.000	326	140
J-1-258	Zone-1	True	300.000	350.000	350.000	302	140
J-1-259	Zone-1	True	300.000	350.000	350.000	212	140
J-1-260	Zone-1	True	300.000	350.000	350.000	229	140
J-1-261	Zone-1	True	300.000	350.000	350.000	305	140
J-1-262	Zone-1	True	300.000	350.000	350.000	309	140
J-1-263	Zone-1	True	300.000	350.000	350.000	329	140
J-1-264	Zone-1	True	300.000	350.000	350.000	298	140
J-1-265	Zone-1	True	300.000	350.000	350.000	282	140
J-1-273	Zone-1	True	300.000	350.000	350.000	341	140
J-1-274	Zone-1	True	300.000	350.000	350.000	374	140
J-1-304	Zone-1	True	300.000	350.000	350.000	300	140
J-1-50	Industrial	True	300.000	350.000	350.000	425	140
J-1-51	Industrial	True	300.000	350.000	350.000	443	140
J-1-52	Zone-1	True	300.000	350.000	350.000	443	140
J-1-53	Zone-1	True	300.000	350.000	350.000	466	140
J-1-54	<None>	True	300.000	350.000	350.000	463	140
J-1-55	<None>	True	300.000	350.000	350.000	475	140
J-1-56	Zone-1	True	300.000	350.000	350.000	426	140
J-1-57	Zone-1	True	300.000	350.000	350.000	418	140
J-1-63	Zone-1	True	300.000	350.000	350.000	423	140
J-1-64	<None>	True	300.000	350.000	350.000	458	140
J-1-65	Zone-1	True	300.000	350.000	350.000	467	140
J-1-66	<None>	True	300.000	350.000	350.000	450	140
J-1-67	<None>	True	300.000	350.000	350.000	483	140
J-1-68	<None>	True	300.000	350.000	350.000	489	140
J-1-69	Zone-1	True	300.000	350.000	350.000	494	140
J-1-70	Zone-1	True	300.000	350.000	350.000	470	140
J-1-71	<None>	True	300.000	350.000	350.000	435	140
J-1-72	<None>	True	300.000	350.000	350.000	418	140
J-1-73	<None>	True	300.000	350.000	350.000	400	140
J-1-74	<None>	True	300.000	350.000	350.000	361	140
J-2-126	Zone-2	True	300.000	350.000	350.000	346	140
J-2-149	Zone-2	True	300.000	350.000	350.000	276	140
J-2-150	Zone-2	True	300.000	350.000	350.000	326	140
J-2-151	Zone-2	True	300.000	350.000	350.000	356	140
J-2-165	Zone-2	True	300.000	350.000	350.000	400	140
J-2-166	Zone-2	True	300.000	350.000	350.000	401	140
J-2-191	Zone-2	True	300.000	350.000	350.000	332	140
J-2-193	Zone-2	True	300.000	350.000	350.000	309	140
J-2-210A	Zone-2	True	300.000	350.000	350.000	202	140
J-2-210C	Zone-2	True	300.000	341.379	350.000	140	140
J-2-237	Zone-2	True	300.000	350.000	350.000	297	140
J-2-238	Zone-2	True	300.000	350.000	350.000	334	140
J-2-249	Zone-2	True	300.000	350.000	350.000	355	140
J-2-250	Zone-2	True	300.000	350.000	350.000	359	140
J-2-269	Zone-2	True	300.000	350.000	350.000	382	140
J-2-270	Zone-2	True	300.000	350.000	350.000	457	140
J-2-283	Zone-2	True	300.000	350.000	350.000	451	140
J-2-320	Zone-2	True	300.000	350.000	350.000	433	140
J-2-328	Zone-2	True	300.000	350.000	350.000	222	140
J-2-356	Zone-2	True	300.000	350.000	350.000	432	140
J-2-357	Zone-2	True	300.000	350.000	350.000	472	140
J-2-39	Zone-2	True	300.000	350.000	350.000	215	140
J-2-411a	Zone-2	True	300.000	350.000	350.000	196	140
J-2-412	Zone-2	True	300.000	350.000	350.000	435	140
J-2-431c	Zone-2	True	300.000	350.000	350.000	431	140
J-2-439	Zone-2	True	300.000	350.000	350.000	437	140
J-2-448	Zone-2	True	300.000	350.000	350.000	418	140
J-2-449	Zone-2	True	300.000	350.000	350.000	432	140
J-2-459	Zone-2	True	300.000	350.000	350.000	423	140
J-2-472	Zone-2	True	300.000	350.000	350.000	374	140
J-2-512	Zone-2	True	300.000	350.000	350.000	311	140
J-2-513	Zone-2	True	300.000	350.000	350.000	349	140
J-2-550	Zone-2	True	300.000	350.000	350.000	268	140
J-2-551	Zone-2	True	300.000	350.000	350.000	277	140
J-73	<None>	True	300.000	350.000	350.000	255	140
J-81	<None>	True	300.000	350.000	350.000	365	140
J-82	<None>	True	300.000	350.000	350.000	301	140
J-83	<None>	True	300.000	350.000	350.000	290	140
J-84	<None>	True	300.000	350.000	350.000	379	140
J-85	<None>	True	300.000	350.000	350.000	311	140
J-86	<None>	True	300.000	350.000	350.000	317	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-87	<None>	True	300.000	350.000	350.000	348	140
J-88	<None>	False	300.000	298.414	350.000	140	140
J-100	Industrial	True	300.000	350.000	350.000	288	140
J-101	Industrial	True	300.000	350.000	350.000	300	140
J-103	Industrial	True	300.000	350.000	350.000	497	140
J-143	Industrial	True	300.000	329.471	350.000	140	140
J-145	Industrial	True	300.000	350.000	350.000	224	140
J-146	Industrial	True	300.000	350.000	350.000	296	140
J-159	Industrial	True	300.000	335.228	350.000	140	140
J-160	Industrial	True	300.000	350.000	350.000	199	140
J-161	Industrial	True	300.000	350.000	350.000	217	140
J-162	Industrial	True	300.000	350.000	350.000	237	140
J-186	Industrial	True	300.000	350.000	350.000	173	140
J-187	Industrial	True	300.000	350.000	350.000	338	140
J-190	Industrial	False	300.000	(N/A)	350.000	(N/A)	140
J-201	<None>	True	300.000	350.000	350.000	438	140
J-226	<None>	True	300.000	350.000	350.000	334	140
J-227	<None>	True	300.000	350.000	350.000	203	140
J-228	<None>	True	300.000	303.798	350.000	140	140
J-230	<None>	False	300.000	291.913	350.000	140	140
J-239	<None>	True	300.000	350.000	350.000	309	140
J-240	<None>	True	300.000	350.000	350.000	332	140
J-444	Zone-2	True	300.000	350.000	350.000	373	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-1-1	Industrial	True	300.000	350.000	350.000	440	140
J-1-11	Industrial	True	300.000	350.000	350.000	451	140
J-1-12	Industrial	True	300.000	350.000	350.000	441	140
J-1-13	Industrial	True	300.000	350.000	350.000	405	140
J-1-14	Industrial	True	300.000	350.000	350.000	378	140
J-1-15	Industrial	True	300.000	350.000	350.000	362	140
J-1-16	Industrial	True	300.000	350.000	350.000	323	140
J-1-17	Industrial	True	300.000	350.000	350.000	385	140
J-1-18	Industrial	True	300.000	350.000	350.000	316	140
J-1-19	Industrial	True	300.000	350.000	350.000	392	140
J-1-2	Industrial	True	300.000	350.000	350.000	451	140
J-1-20	Industrial	False	300.000	(N/A)	350.000	(N/A)	140
J-1-21	Industrial	True	300.000	350.000	350.000	362	140
J-1-22	Industrial	True	300.000	350.000	350.000	361	140
J-1-23	Industrial	True	300.000	350.000	350.000	407	140
J-1-24	Industrial	True	300.000	350.000	350.000	399	140
J-1-248	Industrial	True	300.000	350.000	350.000	309	140
J-1-249	Industrial	True	300.000	350.000	350.000	250	140
J-1-25	Industrial	True	300.000	350.000	350.000	245	140
J-1-252	Industrial	True	300.000	350.000	350.000	231	140
J-1-253	Industrial	True	300.000	350.000	350.000	177	140
J-1-254	Industrial	True	300.000	350.000	350.000	180	140
J-1-255	Industrial	True	300.000	350.000	350.000	251	140
J-1-256	Industrial	True	300.000	350.000	350.000	311	140
J-1-26	Industrial	True	300.000	350.000	350.000	224	140
J-1-27	Industrial	True	300.000	350.000	350.000	406	140
J-1-28	Industrial	True	300.000	350.000	350.000	380	140
J-1-29	Industrial	True	300.000	350.000	350.000	389	140
J-1-3	Industrial	True	300.000	350.000	350.000	446	140
J-1-30	Industrial	True	300.000	350.000	350.000	276	140
J-1-308	Industrial	True	300.000	350.000	350.000	277	140
J-1-309	Industrial	True	300.000	350.000	350.000	337	140
J-1-31	Industrial	True	300.000	350.000	350.000	401	140
J-1-310	Industrial	True	300.000	350.000	350.000	257	140
J-1-311	Industrial	True	300.000	350.000	350.000	310	140
J-1-312	Industrial	True	300.000	350.000	350.000	374	140
J-1-313	Industrial	True	300.000	350.000	350.000	365	140
J-1-314	Industrial	True	300.000	350.000	350.000	315	140
J-1-315	Industrial	True	300.000	350.000	350.000	376	140
J-1-316	Industrial	True	300.000	350.000	350.000	425	140
J-1-317	Industrial	True	300.000	350.000	350.000	285	140
J-1-318	Industrial	True	300.000	350.000	350.000	374	140
J-1-319	Industrial	True	300.000	350.000	350.000	387	140
J-1-32	Industrial	True	300.000	350.000	350.000	378	140
J-1-320	Industrial	True	300.000	350.000	350.000	437	140
J-1-321	Industrial	True	300.000	350.000	350.000	448	140
J-1-322	Industrial	True	300.000	350.000	350.000	362	140
J-1-323	Industrial	True	300.000	350.000	350.000	412	140
J-1-324	Industrial	True	300.000	350.000	350.000	388	140
J-1-325	Industrial	True	300.000	350.000	350.000	386	140
J-1-326	Industrial	True	300.000	350.000	350.000	159	140
J-1-32a	Industrial	True	300.000	350.000	350.000	340	140
J-1-33	Industrial	True	300.000	350.000	350.000	364	140
J-1-35	Industrial	True	300.000	350.000	350.000	406	140
J-1-36	Industrial	True	300.000	350.000	350.000	423	140
J-1-37	Industrial	True	300.000	350.000	350.000	381	140
J-1-38	Industrial	True	300.000	350.000	350.000	369	140
J-1-39	Industrial	True	300.000	350.000	350.000	298	140
J-1-4	Industrial	True	300.000	350.000	350.000	439	140
J-1-40	Industrial	True	300.000	350.000	350.000	372	140
J-1-41	Industrial	True	300.000	350.000	350.000	404	140
J-1-42	Industrial	True	300.000	350.000	350.000	392	140
J-1-43	Industrial	True	300.000	350.000	350.000	403	140
J-1-44	Industrial	True	300.000	350.000	350.000	280	140
J-1-46	Industrial	True	300.000	350.000	350.000	390	140
J-1-47	Industrial	True	300.000	350.000	350.000	403	140
J-1-48	Industrial	True	300.000	350.000	350.000	368	140
J-1-49	Industrial	True	300.000	350.000	350.000	427	140
J-1-50	Industrial	True	300.000	350.000	350.000	425	140
J-1-51	Industrial	True	300.000	350.000	350.000	443	140
J-90	Industrial	True	300.000	350.000	350.000	367	140
J-91	Industrial	True	300.000	350.000	350.000	425	140
J-92	Industrial	True	300.000	350.000	350.000	422	140
J-93	Industrial	True	300.000	350.000	350.000	441	140
J-94	Industrial	True	300.000	350.000	350.000	433	140
J-95	Industrial	True	300.000	350.000	350.000	387	140
J-96	Industrial	True	300.000	350.000	350.000	315	140
J-100	Industrial	True	300.000	350.000	350.000	288	140
J-101	Industrial	True	300.000	350.000	350.000	300	140
J-102	Industrial	True	300.000	350.000	350.000	500	140
J-103	Industrial	True	300.000	350.000	350.000	497	140
J-104	Industrial	True	300.000	350.000	350.000	371	140
J-105	Industrial	True	300.000	350.000	350.000	314	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-106	Industrial	True	300.000	350.000	350.000	429	140
J-107	Industrial	True	300.000	350.000	350.000	375	140
J-108	Industrial	True	300.000	350.000	350.000	434	140
J-109	Industrial	True	300.000	350.000	350.000	403	140
J-110	Industrial	True	300.000	350.000	350.000	407	140
J-111	Industrial	True	300.000	350.000	350.000	397	140
J-112	Industrial	True	300.000	350.000	350.000	397	140
J-113	Industrial	True	300.000	350.000	350.000	374	140
J-114	Industrial	True	300.000	350.000	350.000	320	140
J-115	Industrial	True	300.000	350.000	350.000	348	140
J-116	Industrial	True	300.000	350.000	350.000	380	140
J-117	Industrial	True	300.000	350.000	350.000	364	140
J-118	Industrial	True	300.000	350.000	350.000	393	140
J-119	Industrial	True	300.000	350.000	350.000	368	140
J-120	Industrial	True	300.000	350.000	350.000	340	140
J-121	Industrial	True	300.000	350.000	350.000	247	140
J-122	Industrial	True	300.000	350.000	350.000	363	140
J-123	Industrial	True	300.000	350.000	350.000	333	140
J-124	Industrial	True	300.000	350.000	350.000	349	140
J-125	Industrial	True	300.000	350.000	350.000	373	140
J-126	Industrial	True	300.000	350.000	350.000	336	140
J-127	Industrial	True	300.000	350.000	350.000	261	140
J-128	Industrial	True	300.000	350.000	350.000	264	140
J-129	Industrial	True	300.000	350.000	350.000	363	140
J-130	Industrial	True	300.000	350.000	350.000	387	140
J-131	Industrial	True	300.000	350.000	350.000	356	140
J-132	Industrial	True	300.000	350.000	350.000	349	140
J-138	Industrial	True	300.000	350.000	350.000	302	140
J-139	Industrial	True	300.000	350.000	350.000	214	140
J-140	Industrial	True	300.000	350.000	350.000	290	140
J-143	Industrial	True	300.000	329.471	350.000	140	140
J-144	Industrial	True	300.000	350.000	350.000	283	140
J-145	Industrial	True	300.000	350.000	350.000	224	140
J-146	Industrial	True	300.000	350.000	350.000	296	140
J-147	Industrial	True	300.000	350.000	350.000	337	140
J-148	Industrial	True	300.000	350.000	350.000	366	140
J-149	Industrial	True	300.000	350.000	350.000	319	140
J-150	Industrial	True	300.000	350.000	350.000	316	140
J-151	Industrial	True	300.000	350.000	350.000	361	140
J-152	Industrial	True	300.000	350.000	350.000	323	140
J-153	Industrial	True	300.000	350.000	350.000	318	140
J-154	Industrial	True	300.000	350.000	350.000	261	140
J-155	Industrial	True	300.000	350.000	350.000	268	140
J-156	Industrial	True	300.000	350.000	350.000	180	140
J-157	Industrial	True	300.000	350.000	350.000	279	140
J-158	Industrial	True	300.000	350.000	350.000	232	140
J-159	Industrial	True	300.000	335.228	350.000	140	140
J-160	Industrial	True	300.000	350.000	350.000	199	140
J-161	Industrial	True	300.000	350.000	350.000	217	140
J-162	Industrial	True	300.000	350.000	350.000	237	140
J-163	Industrial	True	300.000	350.000	350.000	316	140
J-164	Industrial	True	300.000	350.000	350.000	305	140
J-165	Industrial	True	300.000	350.000	350.000	296	140
J-166	Industrial	True	300.000	350.000	350.000	295	140
J-167	Industrial	True	300.000	350.000	350.000	289	140
J-168	Industrial	True	300.000	350.000	350.000	289	140
J-169	Industrial	True	300.000	350.000	350.000	266	140
J-170	Industrial	True	300.000	350.000	350.000	275	140
J-171	Industrial	True	300.000	350.000	350.000	300	140
J-172	Industrial	True	300.000	350.000	350.000	291	140
J-173	Industrial	True	300.000	350.000	350.000	287	140
J-174	Industrial	True	300.000	350.000	350.000	258	140
J-175	Industrial	True	300.000	350.000	350.000	352	140
J-176	Industrial	True	300.000	350.000	350.000	386	140
J-177	Industrial	True	300.000	350.000	350.000	322	140
J-178	Industrial	True	300.000	350.000	350.000	353	140
J-179	Industrial	True	300.000	350.000	350.000	186	140
J-180	Industrial	True	300.000	350.000	350.000	273	140
J-181	Industrial	True	300.000	350.000	350.000	272	140
J-182	Industrial	True	300.000	350.000	350.000	226	140
J-183	Industrial	True	300.000	350.000	350.000	284	140
J-184	Industrial	True	300.000	350.000	350.000	248	140
J-185	Industrial	True	300.000	350.000	350.000	244	140
J-186	Industrial	True	300.000	350.000	350.000	173	140
J-187	Industrial	True	300.000	350.000	350.000	338	140
J-188	Industrial	True	300.000	350.000	350.000	202	140
J-189	Industrial	True	300.000	350.000	350.000	247	140
J-190	Industrial	False	300.000	(N/A)	350.000	(N/A)	140
J-191	Industrial	True	300.000	350.000	350.000	406	140
J-192	Industrial	True	300.000	350.000	350.000	448	140
J-193	Industrial	True	300.000	350.000	350.000	426	140
J-194	Industrial	True	300.000	350.000	350.000	462	140
J-195	Industrial	True	300.000	350.000	350.000	365	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-196	Industrial	True	300.000	350.000	350.000	390	140
J-197	Industrial	True	300.000	350.000	350.000	354	140
J-221	Industrial	True	300.000	350.000	350.000	347	140
J-222	Industrial	True	300.000	350.000	350.000	344	140
J-223	Industrial	True	300.000	350.000	350.000	355	140
J-224	Industrial	True	300.000	350.000	350.000	380	140
J-225	Industrial	True	300.000	350.000	350.000	361	140
J-234	Industrial	True	300.000	350.000	350.000	222	140
J-235	Industrial	True	300.000	350.000	350.000	235	140
J-236	Industrial	True	300.000	350.000	350.000	377	140
J-237	Industrial	True	300.000	350.000	350.000	310	140
J-238	Industrial	True	300.000	350.000	350.000	319	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-1-318	Industrial	True	100.000	350.000	350.000	374	140
J-97	<None>	True	100.000	350.000	350.000	242	140
J-98	<None>	True	100.000	350.000	350.000	211	140
J-99	<None>	True	100.000	350.000	350.000	212	140
J-133	<None>	True	100.000	312.373	350.000	140	140
J-134	<None>	True	100.000	289.474	350.000	140	140
J-135	<None>	True	100.000	319.322	350.000	140	140
J-136	<None>	True	100.000	314.953	350.000	140	140
J-137	<None>	True	100.000	294.327	350.000	140	140
J-141	<None>	True	100.000	239.216	350.000	140	140
J-142	<None>	True	100.000	143.685	350.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-1	Zone-2	True	100.000	350.000	350.000	385	140
J-2-10	Zone-2	True	100.000	284.713	350.000	140	140
J-2-100	Zone-2	True	100.000	205.005	350.000	140	140
J-2-101	Zone-2	True	100.000	236.606	350.000	154	140
J-2-102	Zone-2	True	100.000	227.224	350.000	140	140
J-2-103	Zone-2	True	100.000	236.727	350.000	154	140
J-2-104	Zone-2	True	100.000	237.230	350.000	140	140
J-2-105	Zone-2	True	100.000	220.472	350.000	140	140
J-2-106	Zone-2	True	100.000	235.185	350.000	140	140
J-2-107	Zone-2	True	100.000	238.178	350.000	140	140
J-2-108	Zone-2	True	100.000	207.363	350.000	140	140
J-2-109	Zone-2	True	100.000	244.270	350.000	140	140
J-2-11	Zone-2	True	100.000	336.407	350.000	140	140
J-2-110	Zone-2	True	100.000	273.999	350.000	140	140
J-2-111	Zone-2	True	100.000	313.949	350.000	140	140
J-2-112	Zone-2	True	100.000	163.455	350.000	140	140
J-2-113	Zone-2	True	100.000	175.117	350.000	140	140
J-2-114	Zone-2	True	100.000	185.983	350.000	140	140
J-2-115	Zone-2	True	100.000	174.323	350.000	140	140
J-2-116	Zone-2	True	100.000	204.930	350.000	162	140
J-2-117	Zone-2	True	100.000	350.000	350.000	234	140
J-2-118	Zone-2	True	100.000	335.206	350.000	140	140
J-2-119	Zone-2	True	100.000	350.000	350.000	232	140
J-2-12	Zone-2	True	100.000	350.000	350.000	359	140
J-2-120	Zone-2	True	100.000	312.521	350.000	140	140
J-2-121	<None>	True	100.000	350.000	350.000	258	140
J-2-122	<None>	True	100.000	349.863	350.000	140	140
J-2-123	Zone-2	True	100.000	350.000	350.000	160	140
J-2-124	<None>	True	100.000	256.293	350.000	140	140
J-2-125	<None>	True	100.000	164.475	350.000	140	140
J-2-126	Zone-2	True	100.000	350.000	350.000	346	140
J-2-127	Zone-2	True	100.000	350.000	350.000	355	140
J-2-128	Zone-2	True	100.000	336.281	350.000	148	140
J-2-129	Zone-2	True	100.000	268.750	350.000	140	140
J-2-13	Zone-2	True	100.000	292.575	350.000	140	140
J-2-130	Zone-2	True	100.000	256.811	350.000	140	140
J-2-131	Zone-2	True	100.000	313.053	350.000	140	140
J-2-132	<None>	True	100.000	323.053	350.000	140	140
J-2-133	Zone-2	True	100.000	259.976	350.000	140	140
J-2-134F	Zone-2	True	100.000	261.318	350.000	140	140
J-2-135	<None>	True	100.000	317.854	350.000	147	140
J-2-136	<None>	True	100.000	251.165	350.000	140	140
J-2-137	<None>	True	100.000	279.455	350.000	140	140
J-2-138	<None>	True	100.000	301.947	350.000	140	140
J-2-139	<None>	True	100.000	268.193	350.000	140	140
J-2-14	Zone-2	True	100.000	271.660	350.000	140	140
J-2-140	<None>	True	100.000	262.936	350.000	140	140
J-2-141	Zone-2	True	100.000	289.884	350.000	140	140
J-2-142	<None>	True	100.000	350.000	350.000	198	140
J-2-143	<None>	True	100.000	282.476	350.000	140	140
J-2-144	<None>	True	100.000	260.116	350.000	140	140
J-2-145	<None>	True	100.000	247.574	350.000	140	140
J-2-146	<None>	True	100.000	304.815	350.000	140	140
J-2-147	<None>	True	100.000	253.526	350.000	140	140
J-2-148	<None>	True	100.000	226.779	350.000	140	140
J-2-149	Zone-2	True	100.000	350.000	350.000	276	140
J-2-15	Zone-2	True	100.000	290.307	350.000	140	140
J-2-150	Zone-2	True	100.000	350.000	350.000	326	140
J-2-151	Zone-2	True	100.000	350.000	350.000	356	140
J-2-152	Zone-2	True	100.000	350.000	350.000	346	140
J-2-153	Zone-2	True	100.000	350.000	350.000	235	140
J-2-154	Zone-2	True	100.000	329.250	350.000	140	140
J-2-155	Zone-2	True	100.000	312.681	350.000	140	140
J-2-156	Zone-2	True	100.000	323.134	350.000	140	140
J-2-157	Zone-2	True	100.000	350.000	350.000	328	140
J-2-158	Zone-2	True	100.000	350.000	350.000	335	140
J-2-159	Zone-2	True	100.000	349.903	350.000	140	140
J-2-16	Zone-2	True	100.000	316.886	350.000	140	140
J-2-160	Zone-2	True	100.000	350.000	350.000	150	140
J-2-161	Zone-2	True	100.000	350.000	350.000	351	140
J-2-162	Zone-2	True	100.000	350.000	350.000	378	140
J-2-163	Zone-2	True	100.000	350.000	350.000	311	140
J-2-165	Zone-2	True	100.000	350.000	350.000	400	140
J-2-166	Zone-2	True	100.000	350.000	350.000	401	140
J-2-167	Zone-2	True	100.000	350.000	350.000	328	140
J-2-168	Zone-2	True	100.000	337.363	350.000	140	140
J-2-169	Zone-2	True	100.000	350.000	350.000	143	140
J-2-17	Zone-2	True	100.000	127.659	350.000	140	140
J-2-170	Zone-2	True	100.000	350.000	350.000	346	140
J-2-171	Zone-2	True	100.000	285.811	350.000	140	140
J-2-172	Zone-2	True	100.000	282.172	350.000	140	140
J-2-173	Zone-2	True	100.000	350.000	350.000	354	140
J-2-173A	Zone-2	True	100.000	342.553	350.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-174	Zone-2	True	100.000	350.000	350.000	170	140
J-2-175	Zone-2	True	100.000	311.912	350.000	140	140
J-2-176	Zone-2	True	100.000	350.000	350.000	191	140
J-2-177	Zone-2	True	100.000	318.788	350.000	140	140
J-2-178	Zone-2	True	100.000	350.000	350.000	363	140
J-2-179	Zone-2	True	100.000	350.000	350.000	370	140
J-2-179A	Zone-2	True	100.000	350.000	350.000	144	140
J-2-18	Zone-2	True	100.000	350.000	350.000	216	140
J-2-180	Zone-2	True	100.000	291.959	350.000	140	140
J-2-181	Zone-2	True	100.000	256.024	350.000	140	140
J-2-182	Zone-2	True	100.000	244.370	350.000	140	140
J-2-183	Zone-2	True	100.000	236.918	350.000	140	140
J-2-184	Zone-2	True	100.000	235.441	350.000	140	140
J-2-185	Zone-2	True	100.000	350.000	350.000	375	140
J-2-186	Zone-2	True	100.000	350.000	350.000	324	140
J-2-187	Zone-2	True	100.000	300.422	350.000	140	140
J-2-188	Zone-2	True	100.000	192.988	350.000	140	140
J-2-189	Zone-2	True	100.000	152.016	350.000	140	140
J-2-19	Zone-2	True	100.000	350.000	350.000	222	140
J-2-190	Zone-2	True	100.000	250.551	350.000	140	140
J-2-191	Zone-2	True	100.000	350.000	350.000	332	140
J-2-192	Zone-2	True	100.000	165.692	350.000	140	140
J-2-193	Zone-2	True	100.000	350.000	350.000	309	140
J-2-194	Zone-2	True	100.000	350.000	350.000	315	140
J-2-195	Zone-2	True	100.000	350.000	350.000	305	140
J-2-196	Zone-2	True	100.000	350.000	350.000	345	140
J-2-197	Zone-2	True	100.000	350.000	350.000	317	140
J-2-198	Zone-2	True	100.000	341.943	350.000	140	140
J-2-199	Zone-2	True	100.000	347.091	350.000	140	140
J-2-2	Zone-2	True	100.000	350.000	350.000	428	140
J-2-20	Zone-2	True	100.000	350.000	350.000	164	140
J-2-200	Zone-2	True	100.000	350.000	350.000	360	140
J-2-201	Zone-2	True	100.000	350.000	350.000	336	140
J-2-202	Zone-2	True	100.000	350.000	350.000	215	140
J-2-203	Zone-2	True	100.000	350.000	350.000	184	140
J-2-204	Zone-2	True	100.000	350.000	350.000	273	140
J-2-205	Zone-2	True	100.000	350.000	350.000	321	140
J-2-206	Zone-2	True	100.000	350.000	350.000	313	140
J-2-207	Zone-2	True	100.000	350.000	350.000	189	140
J-2-208	Zone-2	True	100.000	350.000	350.000	314	140
J-2-209	Zone-2	True	100.000	350.000	350.000	341	140
J-2-21	Zone-2	True	100.000	350.000	350.000	200	140
J-2-210A	Zone-2	True	100.000	350.000	350.000	202	140
J-2-210B	Zone-2	True	100.000	350.000	350.000	340	140
J-2-210C	Zone-2	True	100.000	341.382	350.000	140	140
J-2-211	Zone-2	True	100.000	350.000	350.000	352	140
J-2-212	Zone-2	True	100.000	350.000	350.000	214	140
J-2-213	Zone-2	True	100.000	350.000	350.000	299	140
J-2-214	Zone-2	True	100.000	350.000	350.000	369	140
J-2-215	Zone-2	True	100.000	350.000	350.000	414	140
J-2-215b	Zone-2	True	100.000	134.340	350.000	140	140
J-2-215g	Zone-2	True	100.000	146.310	350.000	140	140
J-2-216	Zone-2	True	100.000	350.000	350.000	403	140
J-2-217	Zone-2	True	100.000	350.000	350.000	397	140
J-2-218	Zone-2	True	100.000	350.000	350.000	393	140
J-2-219	Zone-2	True	100.000	350.000	350.000	407	140
J-2-22	Zone-2	True	100.000	169.858	350.000	140	140
J-2-220	Zone-2	True	100.000	350.000	350.000	398	140
J-2-221	Zone-2	True	100.000	350.000	350.000	288	140
J-2-222	Zone-2	True	100.000	350.000	350.000	230	140
J-2-223	Zone-2	True	100.000	350.000	350.000	246	140
J-2-224	Zone-2	True	100.000	350.000	350.000	174	140
J-2-225	Zone-2	True	100.000	350.000	350.000	274	140
J-2-226	Zone-2	True	100.000	350.000	350.000	415	140
J-2-227	Zone-2	True	100.000	350.000	350.000	353	140
J-2-228	Zone-2	True	100.000	340.071	350.000	140	140
J-2-23	Zone-2	True	100.000	121.500	350.000	140	140
J-2-230	Zone-2	True	100.000	350.000	350.000	251	140
J-2-231	Zone-2	True	100.000	281.920	350.000	140	140
J-2-232	Zone-2	True	100.000	322.407	350.000	140	140
J-2-233	Zone-2	True	100.000	325.381	350.000	140	140
J-2-234	Zone-2	True	100.000	350.000	350.000	391	140
J-2-235	Zone-2	True	100.000	350.000	350.000	357	140
J-2-236	Zone-2	True	100.000	350.000	350.000	333	140
J-2-237	Zone-2	True	100.000	350.000	350.000	297	140
J-2-237	Zone-2	True	100.000	350.000	350.000	409	140
J-2-238	Zone-2	True	100.000	350.000	350.000	334	140
J-2-239	Zone-2	True	100.000	350.000	350.000	286	140
J-2-24	Zone-2	True	100.000	109.868	350.000	140	140
J-2-240	Zone-2	True	100.000	350.000	350.000	242	140
J-2-241	Zone-2	True	100.000	350.000	350.000	270	140
J-2-242	Zone-2	True	100.000	350.000	350.000	255	140
J-2-243	Zone-2	True	100.000	350.000	350.000	265	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-244	Zone-2	True	100.000	350.000	350.000	313	140
J-2-245	Zone-2	True	100.000	350.000	350.000	300	140
J-2-246	Zone-2	True	100.000	350.000	350.000	342	140
J-2-247	Zone-2	True	100.000	350.000	350.000	338	140
J-2-248	Zone-2	True	100.000	350.000	350.000	433	140
J-2-249	Zone-2	True	100.000	350.000	350.000	355	140
J-2-25	Zone-2	False	100.000	68.485	350.000	140	140
J-2-250	Zone-2	True	100.000	350.000	350.000	359	140
J-2-251	Zone-2	True	100.000	350.000	350.000	356	140
J-2-252	Zone-2	True	100.000	350.000	350.000	226	140
J-2-253	Zone-2	True	100.000	350.000	350.000	373	140
J-2-254	Zone-2	True	100.000	350.000	350.000	359	140
J-2-255	Zone-2	True	100.000	350.000	350.000	333	140
J-2-256	Zone-2	True	100.000	350.000	350.000	306	140
J-2-257	Zone-2	True	100.000	350.000	350.000	154	140
J-2-258	Zone-2	True	100.000	350.000	350.000	151	140
J-2-259	Zone-2	True	100.000	350.000	350.000	439	140
J-2-26	Zone-2	True	100.000	119.070	350.000	140	140
J-2-260	Zone-2	True	100.000	350.000	350.000	454	140
J-2-265	Zone-2	True	100.000	331.928	350.000	140	140
J-2-266	Zone-2	True	100.000	343.375	350.000	140	140
J-2-267	Zone-2	True	100.000	350.000	350.000	443	140
J-2-268	Zone-2	True	100.000	350.000	350.000	433	140
J-2-269	Zone-2	True	100.000	350.000	350.000	382	140
J-2-27	Zone-2	True	100.000	150.958	350.000	140	140
J-2-270	Zone-2	True	100.000	350.000	350.000	457	140
J-2-271	Zone-2	True	100.000	350.000	350.000	441	140
J-2-272	Zone-2	True	100.000	350.000	350.000	330	140
J-2-273	Zone-2	True	100.000	350.000	350.000	442	140
J-2-274	Zone-2	True	100.000	350.000	350.000	432	140
J-2-275	Zone-2	True	100.000	241.008	350.000	140	140
J-2-276	Zone-2	True	100.000	350.000	350.000	428	140
J-2-277	Zone-2	True	100.000	328.898	350.000	140	140
J-2-278	Zone-2	True	100.000	350.000	350.000	439	140
J-2-279	Zone-2	True	100.000	350.000	350.000	200	140
J-2-28	Zone-2	True	100.000	121.490	350.000	140	140
J-2-280	Zone-2	True	100.000	326.240	350.000	140	140
J-2-281	Zone-2	True	100.000	324.507	350.000	140	140
J-2-282	Zone-2	True	100.000	350.000	350.000	148	140
J-2-283	Zone-2	True	100.000	350.000	350.000	451	140
J-2-284	Zone-2	True	100.000	350.000	350.000	389	140
J-2-285	Zone-2	True	100.000	350.000	350.000	151	140
J-2-286	Zone-2	True	100.000	350.000	350.000	188	140
J-2-287	Zone-2	True	100.000	350.000	350.000	356	140
J-2-288	Zone-2	True	100.000	283.580	350.000	164	140
J-2-289	Zone-2	True	100.000	214.371	350.000	140	140
J-2-29	Zone-2	True	100.000	126.922	350.000	140	140
J-2-290	Zone-2	True	100.000	204.342	350.000	140	140
J-2-291	Zone-2	True	100.000	211.124	350.000	140	140
J-2-292	Zone-2	True	100.000	221.433	350.000	140	140
J-2-293	Zone-2	True	100.000	350.000	350.000	307	140
J-2-294	Zone-2	True	100.000	348.192	350.000	140	140
J-2-295	Zone-2	True	100.000	300.758	350.000	140	140
J-2-296	Zone-2	True	100.000	350.000	350.000	317	140
J-2-297	Zone-2	True	100.000	183.252	350.000	140	140
J-2-298	Zone-2	True	100.000	350.000	350.000	330	140
J-2-299	Zone-2	True	100.000	350.000	350.000	344	140
J-2-3	Zone-2	True	100.000	334.435	350.000	144	140
J-2-30	Zone-2	True	100.000	220.967	350.000	140	140
J-2-300	Zone-2	True	100.000	350.000	350.000	320	140
J-2-301	Zone-2	True	100.000	350.000	350.000	309	140
J-2-302	Zone-2	True	100.000	350.000	350.000	167	140
J-2-303	Zone-2	True	100.000	350.000	350.000	163	140
J-2-304	Zone-2	True	100.000	350.000	350.000	314	140
J-2-305	Zone-2	True	100.000	350.000	350.000	313	140
J-2-306	Zone-2	True	100.000	313.065	350.000	140	140
J-2-307	Zone-2	True	100.000	279.003	350.000	140	140
J-2-308	Zone-2	True	100.000	285.543	350.000	140	140
J-2-309	Zone-2	True	100.000	318.099	350.000	140	140
J-2-31	Zone-2	True	100.000	270.046	350.000	140	140
J-2-310	Zone-2	True	100.000	350.000	350.000	324	140
J-2-311	Zone-2	True	100.000	350.000	350.000	319	140
J-2-312	Zone-2	True	100.000	180.259	350.000	150	140
J-2-313	Zone-2	True	100.000	131.765	350.000	140	140
J-2-314	Zone-2	True	100.000	133.345	350.000	140	140
J-2-315	Zone-2	True	100.000	350.000	350.000	460	140
J-2-316	Zone-2	True	100.000	347.930	350.000	140	140
J-2-317	Zone-2	True	100.000	350.000	350.000	232	140
J-2-318	Zone-2	True	100.000	350.000	350.000	450	140
J-2-319	Zone-2	True	100.000	350.000	350.000	321	140
J-2-32	Zone-2	True	100.000	191.728	350.000	140	140
J-2-320	Zone-2	True	100.000	350.000	350.000	433	140
J-2-321	Zone-2	True	100.000	350.000	350.000	313	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-322	Zone-2	True	100.000	205.372	350.000	140	140
J-2-323	Zone-2	True	100.000	291.681	350.000	140	140
J-2-324	Zone-2	True	100.000	238.149	350.000	140	140
J-2-325	Zone-2	True	100.000	215.334	350.000	140	140
J-2-326	Zone-2	True	100.000	154.324	350.000	140	140
J-2-327	Zone-2	True	100.000	155.371	350.000	140	140
J-2-328	Zone-2	True	100.000	207.958	350.000	140	140
J-2-328	Zone-2	True	100.000	350.000	350.000	222	140
J-2-329	Zone-2	True	100.000	350.000	350.000	244	140
J-2-329	Zone-2	True	100.000	340.800	350.000	140	140
J-2-33	Zone-2	True	100.000	218.438	350.000	140	140
J-2-330	Zone-2	True	100.000	350.000	350.000	262	140
J-2-331	Zone-2	True	100.000	350.000	350.000	315	140
J-2-332	Zone-2	True	100.000	350.000	350.000	273	140
J-2-333	Zone-2	True	100.000	325.052	350.000	140	140
J-2-334	Zone-2	True	100.000	350.000	350.000	286	140
J-2-335	Zone-2	True	100.000	350.000	350.000	311	140
J-2-336	Zone-2	True	100.000	350.000	350.000	236	140
J-2-337	Zone-2	True	100.000	350.000	350.000	182	140
J-2-338	Zone-2	True	100.000	217.455	350.000	148	140
J-2-339	Zone-2	True	100.000	178.953	350.000	140	140
J-2-34	Zone-2	True	100.000	241.817	350.000	140	140
J-2-340	Zone-2	True	100.000	189.588	350.000	140	140
J-2-341	Zone-2	True	100.000	212.434	350.000	140	140
J-2-342	Zone-2	True	100.000	349.861	350.000	148	140
J-2-343	Zone-2	True	100.000	203.930	350.000	140	140
J-2-344	Zone-2	True	100.000	345.685	350.000	140	140
J-2-345	Zone-2	True	100.000	344.680	350.000	146	140
J-2-346	Zone-2	True	100.000	198.234	350.000	149	140
J-2-347	Zone-2	True	100.000	164.148	350.000	140	140
J-2-348	Zone-2	True	100.000	350.000	350.000	150	140
J-2-349	Zone-2	True	100.000	350.000	350.000	170	140
J-2-35	Zone-2	True	100.000	307.776	350.000	140	140
J-2-350	Zone-2	True	100.000	233.679	350.000	150	140
J-2-351	Zone-2	True	100.000	149.601	350.000	140	140
J-2-351	Zone-2	True	100.000	350.000	350.000	272	140
J-2-352	Zone-2	True	100.000	350.000	350.000	223	140
J-2-353	Zone-2	True	100.000	350.000	350.000	260	140
J-2-354	Zone-2	True	100.000	330.805	350.000	140	140
J-2-355	Zone-2	True	100.000	350.000	350.000	281	140
J-2-356	Zone-2	True	100.000	350.000	350.000	432	140
J-2-357	Zone-2	True	100.000	350.000	350.000	472	140
J-2-358	Zone-2	True	100.000	350.000	350.000	385	140
J-2-359	Zone-2	True	100.000	311.164	350.000	140	140
J-2-36	Zone-2	True	100.000	324.685	350.000	140	140
J-2-360	Zone-2	True	100.000	254.831	350.000	148	140
J-2-361	Zone-2	True	100.000	227.533	350.000	140	140
J-2-362	Zone-2	True	100.000	207.235	350.000	140	140
J-2-363	Zone-2	True	100.000	214.886	350.000	140	140
J-2-364	Zone-2	True	100.000	244.867	350.000	140	140
J-2-365	Zone-2	True	100.000	260.818	350.000	140	140
J-2-366	Zone-2	True	100.000	256.007	350.000	140	140
J-2-367	Zone-2	True	100.000	245.279	350.000	140	140
J-2-368	Zone-2	True	100.000	261.361	350.000	140	140
J-2-369	Zone-2	True	100.000	302.974	350.000	141	140
J-2-37	Zone-2	True	100.000	350.000	350.000	220	140
J-2-370	Zone-2	True	100.000	350.000	350.000	308	140
J-2-371	Zone-2	True	100.000	281.537	350.000	140	140
J-2-372	Zone-2	True	100.000	301.731	350.000	140	140
J-2-373	Zone-2	True	100.000	258.661	350.000	140	140
J-2-374	Zone-2	True	100.000	301.145	350.000	140	140
J-2-375	Zone-2	True	100.000	350.000	350.000	176	140
J-2-376	Zone-2	True	100.000	319.959	350.000	140	140
J-2-377	Zone-2	True	100.000	350.000	350.000	349	140
J-2-378	Zone-2	True	100.000	350.000	350.000	362	140
J-2-379	Zone-2	True	100.000	350.000	350.000	310	140
J-2-38	Zone-2	True	100.000	350.000	350.000	201	140
J-2-380	Zone-2	True	100.000	350.000	350.000	292	140
J-2-381	Zone-2	True	100.000	339.300	350.000	140	140
J-2-381	Zone-2	True	100.000	154.986	350.000	140	140
J-2-382	Zone-2	True	100.000	192.151	350.000	151	140
J-2-383	Zone-2	True	100.000	350.000	350.000	276	140
J-2-384	Zone-2	True	100.000	350.000	350.000	294	140
J-2-385	Zone-2	True	100.000	350.000	350.000	227	140
J-2-386	Zone-2	True	100.000	350.000	350.000	155	140
J-2-387	Zone-2	True	100.000	182.622	350.000	140	140
J-2-388	Zone-2	True	100.000	350.000	350.000	156	140
J-2-389	Zone-2	True	100.000	350.000	350.000	199	140
J-2-39	Zone-2	True	100.000	350.000	350.000	215	140
J-2-390	Zone-2	True	100.000	315.838	350.000	140	140
J-2-391	Zone-2	True	100.000	251.927	350.000	140	140
J-2-392	Zone-2	True	100.000	302.466	350.000	140	140
J-2-393	Zone-2	True	100.000	350.000	350.000	141	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-394	Zone-2	True	100.000	350.000	350.000	349	140
J-2-395	Zone-2	True	100.000	319.681	350.000	140	140
J-2-395	Zone-2	True	100.000	350.000	350.000	348	140
J-2-396	Zone-2	True	100.000	243.069	350.000	140	140
J-2-396	Zone-2	True	100.000	350.000	350.000	339	140
J-2-397	Zone-2	True	100.000	251.870	350.000	149	140
J-2-397	Zone-2	True	100.000	350.000	350.000	187	140
J-2-398	Zone-2	True	100.000	173.133	350.000	140	140
J-2-398	Zone-2	True	100.000	350.000	350.000	339	140
J-2-399	<None>	True	100.000	192.322	350.000	140	140
J-2-4	Zone-2	True	100.000	177.222	350.000	140	140
J-2-40	Zone-2	True	100.000	350.000	350.000	196	140
J-2-400	<None>	True	100.000	182.942	350.000	140	140
J-2-401	<None>	True	100.000	255.429	350.000	146	140
J-2-402	<None>	True	100.000	242.590	350.000	140	140
J-2-403	<None>	True	100.000	272.005	350.000	140	140
J-2-404	Zone-2	True	100.000	350.000	350.000	250	140
J-2-405	Zone-2	True	100.000	350.000	350.000	228	140
J-2-406	<None>	True	100.000	350.000	350.000	224	140
J-2-407	<None>	True	100.000	350.000	350.000	275	140
J-2-408	<None>	True	100.000	350.000	350.000	350	140
J-2-409	Zone-2	True	100.000	350.000	350.000	382	140
J-2-41	Zone-2	True	100.000	198.070	350.000	140	140
J-2-410	Zone-2	True	100.000	312.881	350.000	140	140
J-2-411	Zone-2	True	100.000	350.000	350.000	330	140
J-2-411a	Zone-2	True	100.000	350.000	350.000	196	140
J-2-412	Zone-2	True	100.000	350.000	350.000	435	140
J-2-413	Zone-2	True	100.000	350.000	350.000	412	140
J-2-415	Zone-2	True	100.000	350.000	350.000	356	140
J-2-416	Zone-2	True	100.000	350.000	350.000	376	140
J-2-417	Zone-2	True	100.000	350.000	350.000	328	140
J-2-418	Zone-2	True	100.000	203.044	350.000	140	140
J-2-419	Zone-2	True	100.000	350.000	350.000	319	140
J-2-42	Zone-2	True	100.000	131.809	350.000	140	140
J-2-420	Zone-2	True	100.000	343.932	350.000	140	140
J-2-421	Zone-2	True	100.000	350.000	350.000	282	140
J-2-422	Zone-2	True	100.000	268.650	350.000	140	140
J-2-423	Zone-2	True	100.000	249.883	350.000	140	140
J-2-424	Zone-2	True	100.000	350.000	350.000	267	140
J-2-425	Zone-2	True	100.000	234.470	350.000	140	140
J-2-426	Zone-2	True	100.000	350.000	350.000	281	140
J-2-427	Zone-2	True	100.000	350.000	350.000	279	140
J-2-428	Zone-2	True	100.000	198.947	350.000	140	140
J-2-429	Zone-2	True	100.000	350.000	350.000	272	140
J-2-43	Zone-2	True	100.000	204.053	350.000	140	140
J-2-430	Zone-2	True	100.000	334.310	350.000	140	140
J-2-431	Zone-2	True	100.000	350.000	350.000	351	140
J-2-431c	Zone-2	True	100.000	350.000	350.000	431	140
J-2-432	Zone-2	True	100.000	350.000	350.000	233	140
J-2-433	Zone-2	True	100.000	219.901	350.000	140	140
J-2-434	Zone-2	True	100.000	350.000	350.000	384	140
J-2-435	Zone-2	True	100.000	350.000	350.000	379	140
J-2-436	Zone-2	True	100.000	224.529	350.000	140	140
J-2-437	Zone-2	True	100.000	350.000	350.000	375	140
J-2-438	Zone-2	True	100.000	350.000	350.000	256	140
J-2-439	Zone-2	True	100.000	350.000	350.000	410	140
J-2-439	Zone-2	True	100.000	350.000	350.000	437	140
J-2-44	Zone-2	True	100.000	164.613	350.000	140	140
J-2-441	Zone-2	True	100.000	211.161	350.000	140	140
J-2-442	Zone-2	True	100.000	337.647	350.000	149	140
J-2-443	Zone-2	True	100.000	227.499	350.000	152	140
J-2-444	Zone-2	True	100.000	183.703	350.000	140	140
J-2-445	Zone-2	True	100.000	350.000	350.000	370	140
J-2-446	Zone-2	True	100.000	350.000	350.000	379	140
J-2-447	Zone-2	True	100.000	350.000	350.000	285	140
J-2-448	Zone-2	True	100.000	350.000	350.000	418	140
J-2-449	Zone-2	True	100.000	350.000	350.000	432	140
J-2-45	Zone-2	True	100.000	143.780	350.000	140	140
J-2-450	Zone-2	True	100.000	350.000	350.000	257	140
J-2-451	Zone-2	True	100.000	261.024	350.000	140	140
J-2-452	Zone-2	True	100.000	145.886	350.000	140	140
J-2-453	Zone-2	True	100.000	200.998	350.000	141	140
J-2-454	Zone-2	True	100.000	274.112	350.000	141	140
J-2-455	Zone-2	True	100.000	302.436	350.000	140	140
J-2-456	Zone-2	True	100.000	350.000	350.000	209	140
J-2-457	Zone-2	True	100.000	204.630	350.000	140	140
J-2-458	Zone-2	True	100.000	350.000	350.000	258	140
J-2-459	Zone-2	True	100.000	350.000	350.000	423	140
J-2-46	Zone-2	True	100.000	140.664	350.000	140	140
J-2-460	Zone-2	True	100.000	350.000	350.000	397	140
J-2-461	Zone-2	True	100.000	350.000	350.000	384	140
J-2-462	Zone-2	True	100.000	350.000	350.000	371	140
J-2-463	Zone-2	True	100.000	350.000	350.000	374	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-464	Zone-2	True	100.000	264.237	350.000	148	140
J-2-465	Zone-2	True	100.000	184.420	350.000	140	140
J-2-466	Zone-2	True	100.000	350.000	350.000	368	140
J-2-467	Zone-2	True	100.000	350.000	350.000	333	140
J-2-468	<None>	True	100.000	350.000	350.000	365	140
J-2-469	Zone-2	True	100.000	350.000	350.000	363	140
J-2-469	Zone-2	True	100.000	350.000	350.000	278	140
J-2-47	Zone-2	True	100.000	249.124	350.000	140	140
J-2-470	Zone-2	True	100.000	350.000	350.000	279	140
J-2-471	Zone-2	True	100.000	350.000	350.000	227	140
J-2-472	Zone-2	True	100.000	350.000	350.000	374	140
J-2-473	Zone-2	True	100.000	350.000	350.000	257	140
J-2-474	Zone-2	True	100.000	350.000	350.000	261	140
J-2-475	Zone-2	True	100.000	291.399	350.000	140	140
J-2-476	Zone-2	True	100.000	262.350	350.000	140	140
J-2-477	Zone-2	True	100.000	191.564	350.000	140	140
J-2-478	Zone-2	True	100.000	207.333	350.000	140	140
J-2-479	Zone-2	True	100.000	260.260	350.000	140	140
J-2-48	Zone-2	True	100.000	350.000	350.000	282	140
J-2-480	Zone-2	True	100.000	275.125	350.000	146	140
J-2-481	Zone-2	True	100.000	165.877	350.000	140	140
J-2-482	Zone-2	True	100.000	350.000	350.000	276	140
J-2-483	Zone-2	True	100.000	350.000	350.000	206	140
J-2-484	Zone-2	True	100.000	350.000	350.000	271	140
J-2-485	Zone-2	True	100.000	350.000	350.000	287	140
J-2-486	Zone-2	True	100.000	350.000	350.000	158	140
J-2-487	Zone-2	True	100.000	216.757	350.000	140	140
J-2-488	Zone-2	True	100.000	214.839	350.000	140	140
J-2-489	Zone-2	True	100.000	350.000	350.000	264	140
J-2-49	Zone-2	True	100.000	337.645	350.000	140	140
J-2-490	Zone-2	True	100.000	255.002	350.000	140	140
J-2-491	Zone-2	True	100.000	350.000	350.000	252	140
J-2-492	Zone-2	True	100.000	350.000	350.000	158	140
J-2-493	Zone-2	True	100.000	350.000	350.000	332	140
J-2-494	Zone-2	True	100.000	181.578	350.000	140	140
J-2-495	Zone-2	True	100.000	254.800	350.000	142	140
J-2-496	Zone-2	True	100.000	350.000	350.000	333	140
J-2-497	Zone-2	True	100.000	350.000	350.000	287	140
J-2-498	Zone-2	True	100.000	326.218	350.000	140	140
J-2-499	Zone-2	True	100.000	305.263	350.000	140	140
J-2-5	Zone-2	True	100.000	350.000	350.000	281	140
J-2-50	Zone-2	True	100.000	259.310	350.000	140	140
J-2-500	Zone-2	True	100.000	350.000	350.000	271	140
J-2-501	Zone-2	True	100.000	350.000	350.000	303	140
J-2-502	Zone-2	True	100.000	350.000	350.000	286	140
J-2-503	Zone-2	True	100.000	231.184	350.000	141	140
J-2-504	Zone-2	True	100.000	201.338	350.000	140	140
J-2-505	Zone-2	True	100.000	350.000	350.000	325	140
J-2-506	Zone-2	True	100.000	350.000	350.000	318	140
J-2-507	Zone-2	True	100.000	350.000	350.000	323	140
J-2-508	Zone-2	True	100.000	350.000	350.000	341	140
J-2-509	Zone-2	True	100.000	350.000	350.000	226	140
J-2-51	Zone-2	True	100.000	226.445	350.000	140	140
J-2-510	Zone-2	True	100.000	303.461	350.000	140	140
J-2-511	Zone-2	True	100.000	350.000	350.000	168	140
J-2-512	Zone-2	True	100.000	350.000	350.000	311	140
J-2-513	Zone-2	True	100.000	350.000	350.000	349	140
J-2-514	Zone-2	True	100.000	350.000	350.000	337	140
J-2-515	Zone-2	True	100.000	350.000	350.000	332	140
J-2-516	Zone-2	True	100.000	350.000	350.000	319	140
J-2-517	<None>	True	100.000	350.000	350.000	290	140
J-2-518	Zone-2	True	100.000	350.000	350.000	201	140
J-2-519	Zone-2	True	100.000	350.000	350.000	201	140
J-2-52	Zone-2	True	100.000	218.167	350.000	140	140
J-2-520	Zone-2	True	100.000	252.462	350.000	140	140
J-2-521	Zone-2	True	100.000	350.000	350.000	289	140
J-2-521	Zone-2	True	100.000	350.000	350.000	243	140
J-2-522	Zone-2	True	100.000	252.518	350.000	140	140
J-2-523	Zone-2	True	100.000	258.062	350.000	140	140
J-2-524	Zone-2	True	100.000	350.000	350.000	252	140
J-2-525	Zone-2	True	100.000	350.000	350.000	282	140
J-2-526	Zone-2	True	100.000	303.826	350.000	150	140
J-2-527	Zone-2	True	100.000	194.189	350.000	140	140
J-2-528	Zone-2	True	100.000	350.000	350.000	197	140
J-2-529	Zone-2	True	100.000	350.000	350.000	185	140
J-2-530	Zone-2	True	100.000	330.872	350.000	140	140
J-2-531	Zone-2	True	100.000	350.000	350.000	203	140
J-2-532	Zone-2	True	100.000	337.201	350.000	140	140
J-2-533	Zone-2	True	100.000	338.331	350.000	140	140
J-2-54	Zone-2	True	100.000	350.000	350.000	182	140
J-2-544	Zone-2	True	100.000	350.000	350.000	260	140
J-2-545	Zone-2	True	100.000	350.000	350.000	323	140
J-2-546	Zone-2	True	100.000	350.000	350.000	332	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-547	Zone-2	True	100.000	350.000	350.000	317	140
J-2-548	Zone-2	True	100.000	350.000	350.000	296	140
J-2-549	Zone-2	True	100.000	350.000	350.000	295	140
J-2-55	Zone-2	True	100.000	324.256	350.000	169	140
J-2-550	Zone-2	True	100.000	350.000	350.000	268	140
J-2-551	Zone-2	True	100.000	350.000	350.000	277	140
J-2-552	Zone-2	True	100.000	350.000	350.000	276	140
J-2-553	Zone-2	True	100.000	350.000	350.000	280	140
J-2-554	Zone-2	True	100.000	350.000	350.000	283	140
J-2-555	Zone-2	True	100.000	350.000	350.000	319	140
J-2-556	Zone-2	True	100.000	350.000	350.000	179	140
J-2-557	Zone-2	True	100.000	350.000	350.000	218	140
J-2-558	Zone-2	True	100.000	350.000	350.000	368	140
J-2-559	Zone-2	True	100.000	350.000	350.000	386	140
J-2-56	Zone-2	True	100.000	305.974	350.000	140	140
J-2-560	Zone-2	True	100.000	350.000	350.000	316	140
J-2-561	Zone-2	True	100.000	350.000	350.000	212	140
J-2-562	Zone-2	True	100.000	294.850	350.000	140	140
J-2-563	Zone-2	True	100.000	350.000	350.000	315	140
J-2-564	Zone-2	True	100.000	350.000	350.000	410	140
J-2-565	Zone-2	True	100.000	350.000	350.000	249	140
J-2-566	Zone-2	True	100.000	319.664	350.000	140	140
J-2-567	Zone-2	True	100.000	319.281	350.000	140	140
J-2-568	Zone-2	True	100.000	350.000	350.000	149	140
J-2-57	Zone-2	True	100.000	320.892	350.000	140	140
J-2-570	Zone-2	True	100.000	350.000	350.000	247	140
J-2-571	Zone-2	True	100.000	350.000	350.000	207	140
J-2-572	Zone-2	True	100.000	349.332	350.000	140	140
J-2-573	Zone-2	True	100.000	350.000	350.000	246	140
J-2-574	Zone-2	True	100.000	333.724	350.000	140	140
J-2-575	Zone-2	True	100.000	337.013	350.000	140	140
J-2-576	Zone-2	True	100.000	308.336	350.000	140	140
J-2-578	Zone-2	True	100.000	196.904	350.000	140	140
J-2-579	Zone-2	True	100.000	199.184	350.000	140	140
J-2-58	Zone-2	True	100.000	232.060	350.000	140	140
J-2-580	Zone-2	True	100.000	308.941	350.000	140	140
J-2-581	Zone-2	True	100.000	322.188	350.000	140	140
J-2-582	Zone-2	True	100.000	203.940	350.000	140	140
J-2-583	Zone-2	True	100.000	225.627	350.000	140	140
J-2-584	Zone-2	True	100.000	350.000	350.000	226	140
J-2-585	Zone-2	True	100.000	350.000	350.000	161	140
J-2-585-1	Zone-2	True	100.000	350.000	350.000	279	140
J-2-586	Zone-2	True	100.000	350.000	350.000	433	140
J-2-587	Zone-2	True	100.000	284.334	350.000	140	140
J-2-588	Zone-2	True	100.000	261.414	350.000	140	140
J-2-589	Zone-2	True	100.000	257.228	350.000	140	140
J-2-59	Zone-2	True	100.000	294.765	350.000	182	140
J-2-590	Zone-2	True	100.000	270.351	350.000	140	140
J-2-591	Zone-2	True	100.000	350.000	350.000	236	140
J-2-592	Zone-2	True	100.000	350.000	350.000	291	140
J-2-593	Zone-2	True	100.000	325.300	350.000	140	140
J-2-594	Zone-2	True	100.000	271.923	350.000	140	140
J-2-595	Zone-2	True	100.000	264.757	350.000	140	140
J-2-596	Zone-2	True	100.000	285.275	350.000	140	140
J-2-597	Zone-2	True	100.000	269.741	350.000	140	140
J-2-598	Zone-2	True	100.000	350.000	350.000	286	140
J-2-599	Zone-2	True	100.000	304.230	350.000	140	140
J-2-6	Zone-2	True	100.000	350.000	350.000	236	140
J-2-60	Zone-2	True	100.000	244.629	350.000	140	140
J-2-600	Zone-2	True	100.000	350.000	350.000	217	140
J-2-601	Zone-2	True	100.000	350.000	350.000	185	140
J-2-602	Zone-2	True	100.000	306.398	350.000	140	140
J-2-603	Zone-2	True	100.000	306.267	350.000	140	140
J-2-604	Zone-2	True	100.000	300.257	350.000	150	140
J-2-605	Zone-2	True	100.000	350.000	350.000	252	140
J-2-606	Zone-2	True	100.000	238.085	350.000	140	140
J-2-607	Zone-2	True	100.000	222.707	350.000	140	140
J-2-608	Zone-2	True	100.000	223.246	350.000	140	140
J-2-609	Zone-2	True	100.000	160.413	350.000	140	140
J-2-61	Zone-2	True	100.000	268.249	350.000	141	140
J-2-610	Zone-2	True	100.000	307.543	350.000	140	140
J-2-611	Zone-2	True	100.000	273.798	350.000	140	140
J-2-612	Zone-2	True	100.000	253.466	350.000	140	140
J-2-613	Zone-2	True	100.000	147.500	350.000	140	140
J-2-614	Zone-2	True	100.000	350.000	350.000	213	140
J-2-615	Zone-2	True	100.000	350.000	350.000	189	140
J-2-616	Zone-2	True	100.000	350.000	350.000	198	140
J-2-617	Zone-2	True	100.000	350.000	350.000	153	140
J-2-618	Zone-2	True	100.000	350.000	350.000	175	140
J-2-619	Zone-2	False	100.000	95.111	350.000	140	140
J-2-62	Zone-2	True	100.000	193.529	350.000	160	140
J-2-620	Zone-2	True	100.000	236.115	350.000	140	140
J-2-621	Zone-2	True	100.000	182.128	350.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
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Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-2-622	Zone-2	True	100.000	246.848	350.000	152	140
J-2-623	Zone-2	True	100.000	185.594	350.000	140	140
J-2-624	Zone-2	True	100.000	185.561	350.000	140	140
J-2-625	Zone-2	True	100.000	249.588	350.000	141	140
J-2-626	Zone-2	True	100.000	272.907	350.000	140	140
J-2-63	Zone-2	True	100.000	148.788	350.000	140	140
J-2-64	Zone-2	True	100.000	185.176	350.000	140	140
J-2-646	Zone-2	True	100.000	350.000	350.000	372	140
J-2-65	Zone-2	True	100.000	177.252	350.000	145	140
J-2-66	Zone-2	True	100.000	184.271	350.000	140	140
J-2-67	Zone-2	True	100.000	162.229	350.000	140	140
J-2-68	Zone-2	True	100.000	120.925	350.000	140	140
J-2-69	Zone-2	True	100.000	198.184	350.000	140	140
J-2-7	Zone-2	True	100.000	132.065	350.000	140	140
J-2-70	Zone-2	True	100.000	183.817	350.000	140	140
J-2-71	Zone-2	True	100.000	202.211	350.000	172	140
J-2-72	Zone-2	True	100.000	266.403	350.000	192	140
J-2-73	Zone-2	True	100.000	265.688	350.000	140	140
J-2-74	Zone-2	True	100.000	275.702	350.000	140	140
J-2-75	Zone-2	True	100.000	199.036	350.000	140	140
J-2-76	Zone-2	True	100.000	195.048	350.000	140	140
J-2-77	Zone-2	True	100.000	343.081	350.000	140	140
J-2-78	Zone-2	True	100.000	250.202	350.000	140	140
J-2-79	Zone-2	True	100.000	297.937	350.000	140	140
J-2-8	Zone-2	True	100.000	318.401	350.000	140	140
J-2-80	Zone-2	True	100.000	289.866	350.000	140	140
J-2-81	Zone-2	True	100.000	194.233	350.000	140	140
J-2-82	Zone-2	True	100.000	342.400	350.000	140	140
J-2-83	Zone-2	True	100.000	251.082	350.000	140	140
J-2-84	Zone-2	True	100.000	126.314	350.000	140	140
J-2-85	Zone-2	True	100.000	129.489	350.000	140	140
J-2-86	Zone-2	True	100.000	179.518	350.000	140	140
J-2-87	Zone-2	True	100.000	140.924	350.000	140	140
J-2-88	Zone-2	True	100.000	121.543	350.000	140	140
J-2-89	Zone-2	True	100.000	185.129	350.000	141	140
J-2-9	Zone-2	True	100.000	337.545	350.000	140	140
J-2-90	Zone-2	True	100.000	198.641	350.000	166	140
J-2-91	Zone-2	True	100.000	102.063	350.000	148	140
J-2-92	Zone-2	False	100.000	77.185	350.000	140	140
J-2-93	Zone-2	True	100.000	350.000	350.000	153	140
J-2-93	Zone-2	True	100.000	235.140	350.000	149	140
J-2-94	Zone-2	True	100.000	237.076	350.000	155	140
J-2-95	Zone-2	True	100.000	233.573	350.000	142	140
J-2-96	Zone-2	True	100.000	176.888	350.000	140	140
J-2-97	Zone-2	True	100.000	168.422	350.000	140	140
J-2-98	Zone-2	True	100.000	213.268	350.000	140	140
J-2-99	Zone-2	True	100.000	196.827	350.000	140	140
J-12	Zone-2	True	100.000	350.000	350.000	215	140
J-49	Zone-2	True	100.000	324.921	350.000	140	140
J-50	Zone-2	True	100.000	350.000	350.000	206	140
J-51	Zone-2	True	100.000	350.000	350.000	242	140
J-52	Zone-2	True	100.000	350.000	350.000	376	140
J-62	Zone-2	True	100.000	285.029	350.000	140	140
J-63	Zone-2	True	100.000	254.272	350.000	140	140
J-65	Zone-2	True	100.000	350.000	350.000	236	140
J-66	<None>	True	100.000	350.000	350.000	411	140
J-67	<None>	True	100.000	350.000	350.000	404	140
J-68	<None>	True	100.000	348.975	350.000	140	140
J-69	<None>	True	100.000	282.778	350.000	140	140
J-70	<None>	True	100.000	327.122	350.000	140	140
J-71	<None>	True	100.000	248.422	350.000	140	140
J-72	<None>	True	100.000	284.889	350.000	140	140
J-73	<None>	True	100.000	350.000	350.000	255	140
J-74	<None>	True	100.000	350.000	350.000	269	140
J-75	<None>	True	100.000	350.000	350.000	277	140
J-76	<None>	True	100.000	350.000	350.000	353	140
J-77	<None>	True	100.000	255.614	350.000	140	140
J-78	<None>	True	100.000	350.000	350.000	321	140
J-79	<None>	True	100.000	258.032	350.000	140	140
J-80	<None>	True	100.000	350.000	350.000	337	140
J-81	<None>	True	100.000	350.000	350.000	365	140
J-82	<None>	True	100.000	350.000	350.000	301	140
J-83	<None>	True	100.000	350.000	350.000	290	140
J-84	<None>	True	100.000	350.000	350.000	379	140
J-85	<None>	True	100.000	350.000	350.000	311	140
J-86	<None>	True	100.000	350.000	350.000	317	140
J-87	<None>	True	100.000	350.000	350.000	348	140
J-88	<None>	True	100.000	298.414	350.000	140	140
J-89	<None>	True	100.000	280.281	350.000	140	140
J-202	<None>	True	100.000	350.000	350.000	172	140
J-203	<None>	True	100.000	269.432	350.000	140	140
J-204	<None>	True	100.000	264.402	350.000	140	140
J-205	<None>	True	100.000	323.389	350.000	140	140

City of Spuce Grove Water System
Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: MDD+FF-Ultimate Water System

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Fire Flow (Upper Limit) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Residual Lower Limit) (kPa)
J-206	<None>	True	100.000	332.517	350.000	140	140
J-207	<None>	True	100.000	243.023	350.000	140	140
J-208	Zone-2	True	100.000	350.000	350.000	322	140
J-209	<None>	True	100.000	350.000	350.000	209	140
J-210	<None>	True	100.000	350.000	350.000	171	140
J-211	<None>	True	100.000	296.622	350.000	140	140
J-212	<None>	True	100.000	242.330	350.000	140	140
J-213	<None>	True	100.000	239.821	350.000	140	140
J-214	<None>	True	100.000	350.000	350.000	148	140
J-215	<None>	True	100.000	342.520	350.000	144	140
J-216	<None>	True	100.000	277.059	350.000	140	140
J-217	<None>	True	100.000	297.728	350.000	140	140
J-218	<None>	True	100.000	254.501	350.000	140	140
J-219	<None>	True	100.000	350.000	350.000	150	140
J-220	<None>	True	100.000	350.000	350.000	209	140
J-241	<None>	True	100.000	284.478	350.000	140	140
J-242	<None>	True	100.000	349.116	350.000	140	140
J-243	<None>	True	100.000	350.000	350.000	212	140
J-244	<None>	True	100.000	350.000	350.000	167	140
J-245	Zone-2	True	100.000	350.000	350.000	195	140
J-246	<None>	True	100.000	350.000	350.000	182	140
J-247	Zone-2	True	100.000	350.000	350.000	225	140
J-347	Zone-1	True	100.000	350.000	350.000	311	140
J-444	Zone-2	True	100.000	350.000	350.000	373	140
J-659	Zone-2	True	100.000	163.547	350.000	156	140
J-660	Zone-2	True	100.000	140.573	350.000	151	140
J-661	Zone-2	True	100.000	127.993	350.000	140	140
J-662	Zone-2	True	100.000	131.713	350.000	149	140
J-663	Zone-2	True	100.000	118.764	350.000	147	140
J-664	Zone-2	True	100.000	104.055	350.000	140	140
J-665	Zone-2	True	100.000	106.570	350.000	140	140
J-666	Zone-2	True	100.000	113.340	350.000	140	140