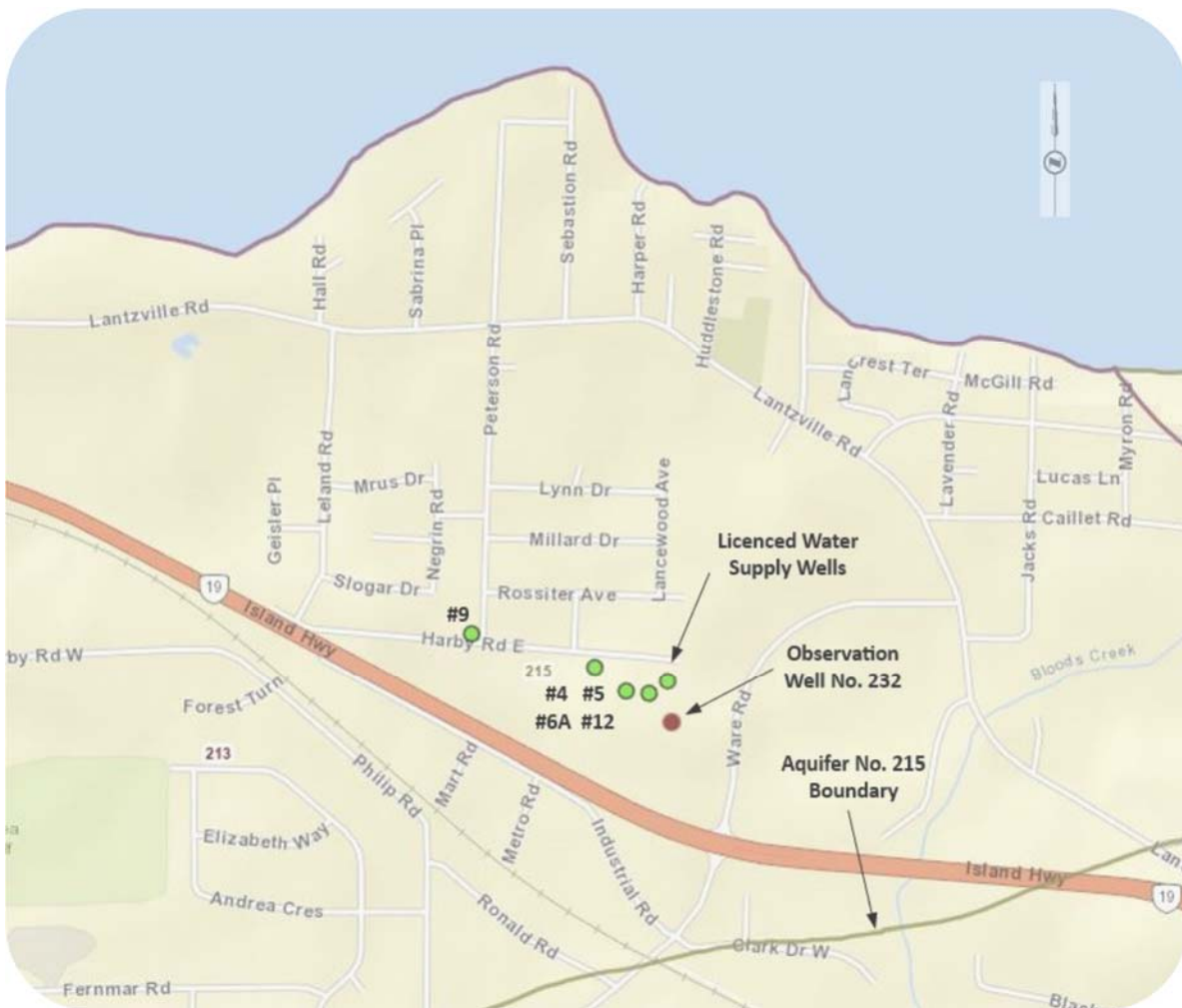




HARBY ROAD WELLFIELD HISTORICAL WITHDRAWAL & PRODUCTION CAPACITY REVIEW



May 8, 2025



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May 8, 2025
2349-02

District of Lantzville
7192 Lantzville Road
PO Box, 100
Lantzville, BC, V0R 2H0

Attention: **Mr. Glenn Morphy**
 Director of Public Works

RE: Harby Road Wellfield
Historical Withdrawal & Production Capacity Review Desktop Study

We are pleased to present our report entitled: Harby Road Wellfield, Historical Withdrawal and Production Capacity Review, May 8, 2025.

This report has been issued to address Council's motion to:

- Estimate the number of new water connections, based on 2,320 Litres/day (2.32 m³/day), Lantzville has available from its current water wells, excluding Nanaimo water and the Foothills development wells;
- Develop a method which can be used for this same aforementioned well water, to calculate the number of available new well water connections there would be at various amounts of litres per day water standards.

Calculation Method

The following equation can be used to estimate the total number of water connections that could potentially be serviced from the District's Harby Road Wellfield wells

$$\text{PNPS} = \text{Potential Number of Properties Serviced} = \frac{\text{Wellfield Pumping Rate}}{\text{Water Demand Per Connection}}$$

Number of New Connections based on 2,320 Litres/day (2.32 m³/day) per connection

Based on the authorized maximum day withdrawal limit of 1,425 m³/day specified by the groundwater licence issued by the provincial government, the maximum number of water connections services could be 614, as shown in the calculation below.

$$\begin{aligned}\text{Potential Number of Properties Serviced} &= \frac{1,425 \text{ m}^3/\text{day}}{2.32 \text{ m}^3/\text{day per connection}} \\ &= 614 \text{ connections}\end{aligned}$$

This is significantly less than the 901 to 922 properties connected to the water system from Year 2019 to Year 2023.

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District of Lantzville
Mr. Glenn Morphy

WELLFIELD PUMPING RATE - A WORD OF CAUTION

Licensed Withdrawal Exceedance

The wellfield pumps extract groundwater under the water license issued in May 2021 by the BC Government. The license has two extraction limits, maximum day and total annual volume. Since the issuance of the water license, we understand that the District has exceeded the withdrawal limits three times:

- Maximum Day Exceedance: Year 2021
- Total Annual Exceedance: Year 2021 & Year 2022

Wellfield Rated Capacity, 2017

An assessment of the long-term sustainable yield for the Harby Road Wellfield wells was carried out for the District of Lantzville in 2017. The assessment calculated a long-term sustainable yield of 2,380 m³/day which is higher than the licenced maximum day withdrawal limit of 1,425 m³/day. However, notably lower groundwater levels were recorded in the summer of Year 2020 and Year 2021 than those during the 2017 assessment. A review should be carried out to assess if these lower levels could impact the wellfield capacity rating.

Summer 2023 – Nanaimo Water & Foothills Well

During the summer of 2023, water was obtained from the City of Nanaimo in response concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Furthermore, we understand that during the summer of 2023, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the Foothills reservoir.

In Year 2023, a total of 27,426 m³ was obtained from the City of Nanaimo and 250,234 m³ from the Harby Road Wellfield. The licenced annual withdrawal limit for the Harby Road wellfield is 260,000 m³/year.

Supply Source Redundancy

The District wellfield contains five wells, each with a different pumping capacity but all obtaining water from the same aquifer. When estimating the potential number of properties that may be serviced from the wellfield, it is prudent to allow for at least one of the wellfield pumps to not be available and this should be the pump with the largest pumping rate.

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District of Lantzville
Mr. Glenn Morphy

WATER DEMAND PER CONNECTION – A WORD OF CAUTION

Year 2023

Our review of Year 2023 maximum day and total annual usage and the Wellfield authorized withdrawal limits suggests a total of 960 to 990 connections could be serviced. In Year 2023, there were 922 active connections, not including any vacant serviced lots, or properties serviced in the Foothills development. The review suggests an additional 38 to 68 connections could be added beyond the 922 active connections serviced in Year 2023.

Number of Committed Connections

The 922 connections (Year 2023) do not include any vacant lots approved by the District that have an existing water service. With recent development, this value is expected to increase as new houses are built and connected to the District's water system.

Current Design Demand Per Connection

In 2018, 2019, & 2020, the District revised (lowered) their Residential Water Design Standard. The current design standards (Bylaw No. 226, 2020), has a per connection design demand ranging from 1,425 L/connection for 3 to 4 story residential building to 2,400 L/connection for a 1 acres Single Family lot. These are now less than the 2,900 L/connection recommended in the Water Demand Design Standard Review, May 13, 2016.

Design Standard Factor of Safety

The design water demand per connection should by their very nature and purpose account for and accommodate the potential wide range of demand that they are applied to. The design water demand is used for both ensuring the securing of adequate water supply as well as the sizing of infrastructure that conveys the supply to the end user. The design water demand should be greater than historical demand, which varies from year to year.

RECOMMENDATION

Based on the findings of this study, it is recommended that:

- The District retain the services of a hydrogeologist to review the Year 2017 Wellfield Capacity Rating calculations and assess what impact the lower groundwater levels experienced in the years of 2020, 2021 and 2022, and the pumping conditions experienced in the summer of 2023 may have on the Capacity Rating Calculation.
- Subject to the findings of item 1 above, the District apply to the provincial government for an adjustment to their water licence for both the maximum day and total annual demand limits.
- The District continue to follow the recommendations noted in our May 2016 Water Demand Design Standard Review.

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May 8, 2025
2349-02

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District of Lantzville
Mr. Glenn Morphy

We thank you for the opportunity to work on this interesting and complex assignment and welcome the opportunity to continue to assist the District in the future.

Please call if you have any questions and we look forward to your response.

Yours truly,

KOERS & ASSOCIATES ENGINEERING LTD.

Chris Holmes, P.Eng.
Project Engineer

Rob Hoffman, P.Eng.
Principal

Permit to Practice No. 1001658
enclosure

KOERS & ASSOCIATES ENGINEERING LTD.





Harby Road Wellfield - Historical Withdrawal & Production Capacity Review

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A	BC Provincial Government Aquifer No. 215 Factsheet (July 2022)
B	Harby Road Wellfield Water Licence No. 503273
C	Simultaneous Pumping and Capacity Assessment at the Harby Road Wellfield, Lantzville, B.C. September 21, 2017 by Lowen Hydrogeology Consulting Ltd.
D	Bylaw No. 226, Schedule “B” Design Standards, Residential Water Design
E	District of Lantzville, Water Demand Design Standard Review, May 13, 2026 - Recommendations

1 INTRODUCTION

1.1 Authorization

In July, the District of Lantzville authorized Koers & Associates Engineering Ltd. to carryout a capacity review of the District's Harby Road Wellfield.

1.2 Study Objectives

The objectives of this study were to address Council's motion of:

- Estimate the number of new water connections, based on 2,320 Litres/day, Lantzville has available from its current water wells, excluding Nanaimo water and the Foothills development wells;
- Develop a method which can be used for this same aforementioned well water, to calculate the number of available new well water connections there would be at various amounts of litres per day water standards.

1.3 Scope of Work

The scope of work for this study was as per our proposal dated March 21, 2024. A summary of the list of tasks to be carried out is presented below:

Task 1 Wellfield Production & Capacity Review

- i) Licenced withdrawal limits
- ii) Sustainable yield
- iii) Daily run-hours for each well pump for the past five years (2019 - 2023)

Task 2 Water Usage (Year 2019 thru 2023)

- i) Wellfield daily pumped volume
- ii) Daily volume obtained from City of Nanaimo
- iii) By Foothills Development (from Harwood Road Reservoir to Foothills reservoir by Harwood Rd transfer pump station)
- iv) Total Number of properties serviced
- v) Total of Individual Metered Usage

Task 3 Non-Revenue Water

- i) Annual amount (volume and percentage of total)
- ii) Comparison with previous reported amounts (2015 Water Supply & Distribution System Study)

Task 4 Per Connection Water Demands (Average Day & Maximum Day)

- i) Bylaw No. 226 design water demands; specifically for Ave Day = 1,300 L/day per connection and Max Day = 2,320 L/day per connection
- ii) Actual water demands for the past five years (2019 - 2023)

Task 5 Number of Properties Served

- i) Bylaw No. 226 design water demands
- ii) Licenced withdrawal limits
- iii) Actual water demands for the past five years (2019 - 2023)
- iv) With largest capacity well out of service

Task 6 Present Findings

- i) Prepare and submit draft report
- ii) Review draft report with District staff
- iii) Finalize and submit sealed report

1.4 Acknowledgements

We gratefully acknowledge with thanks the assistance provided by the following District of Lantzville staff during the course of data collection, analyses, and report preparation:

- Glenn Morphy Director of Public Works
- Matt Woods Public Works Working Foreman

2 WELLFIELD PRODUCTION & CAPACITY REVIEW

2.1 Water Supply Source, Aquifer No. 215

The District of Lantzville's water supply source is the groundwater contained in the aquifer labelled No. 215 by the BC Provincial Government. A factsheet on the aquifer, published by the BC Government, classifies it as a "Confined Glacio-fluvial sand and gravel aquifer" with a relatively small (14.3 km²) catchment area. Water recharge is believed to be by precipitation with little to no mountain block recharge. A copy of the factsheet (dated July 27, 2022) is located in [Appendix A](#).

The District pumps water from the aquifer by five licenced well pumps. **Figure 1** shows the approximately location of:

- the District's five water supply wells,
- the BC Governments groundwater water level monitoring well (No. 232), and
- the boundary of Aquifer No. 215.

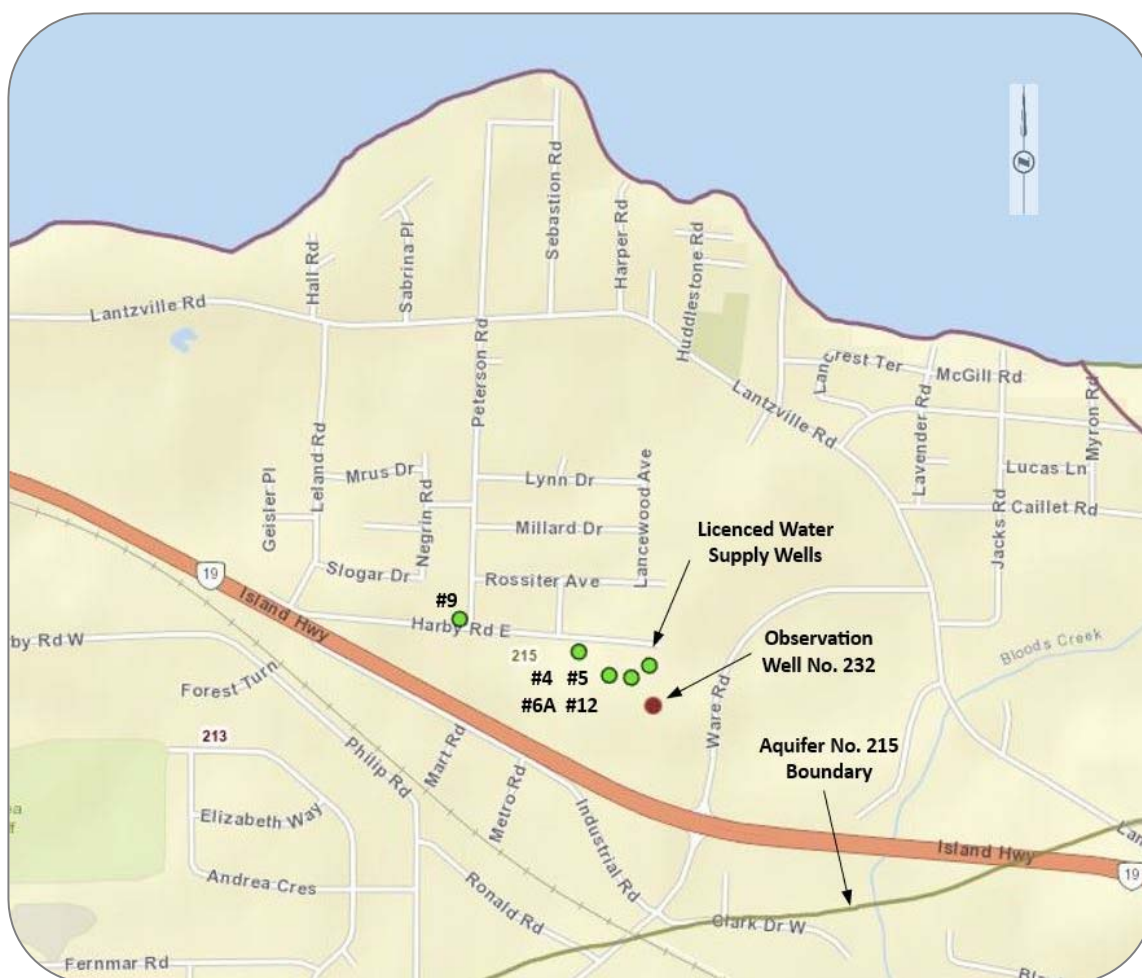


Figure 1 – Water Wells and Aquifer Boundary Location
(base image from BC Water Resource Atlas)

2.2 Production vs Water Licence Limits

In Year 2021, a water licence was issued by the BC Government to the District of Lantzville authorizing the extraction/withdrawal of water from Aquifer No. 215 by the District's existing five groundwater supply wells (**Figure 1**). The licence (see **Appendix B**) contains two authorized withdrawal limits:

- Maximum Day Licenced Withdrawal Limit: 1,425 m³/day
- Total Annual Licenced Withdrawal Limit: 260,000 m³/year

Since the issuance of the water licence, the maximum day withdrawal limit has been exceeded once (Year 2021) and the total annual withdrawal limit exceeded twice (Year 2021 & 2022).

A comparison of the licenced withdrawal limits with the reported extracted amounts since 2019 (past five years) is presented in **Table 1**.

Table 1 – Harby Rd Wellfield Production Review, Licenced vs Historical, 2019 - 2023

Description	Note	Maximum Day m ³ /day	Annual m ³ /year
Water Licence Limit	(1)	1,425	260,000
Wellfield Annual Production			
Year 2019		1,288	250,628
Year 2020	(2)	1,441	283,871
Year 2021	(3)	1,618	273,677
Year 2022	(4)	1,424	278,822
Year 2023	(5)	1,331	250,234

Notes:

- (1) *Conditional Licence No. 503273* for the District's five (5) production wells (Harby Road wellfield) which withdraw water from Aquifer 215. **Bold red text indicates value exceeds licenced withdrawal limit** from the date the licence was issued (April 30, 2021).
 - Maximum Day Licenced Withdrawal Limit: 1,425 m³/day
 - Total Annual Licenced Withdrawal Limit: 260,000 m³/year
- (2) **Year 2020**, comments in the District spreadsheet data state this includes the volume of water used for compaction, testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (3) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (4) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (5) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with

the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.

2.3 Wellfield Pumping Capacity

2.3.1 Year 2017 Wellfield Capacity Rating

An assessment of the long-term sustainable yield for the Harby Road Wellfield wells was carried out for the District of Lantzville in August 2017. Pump testing started at 11 am on August 28 and ending at 3 pm on August 29 and the water level in each well was monitored and recorded. A copy of the drawdown level vs time for each well is presented below in **Figure 2**.

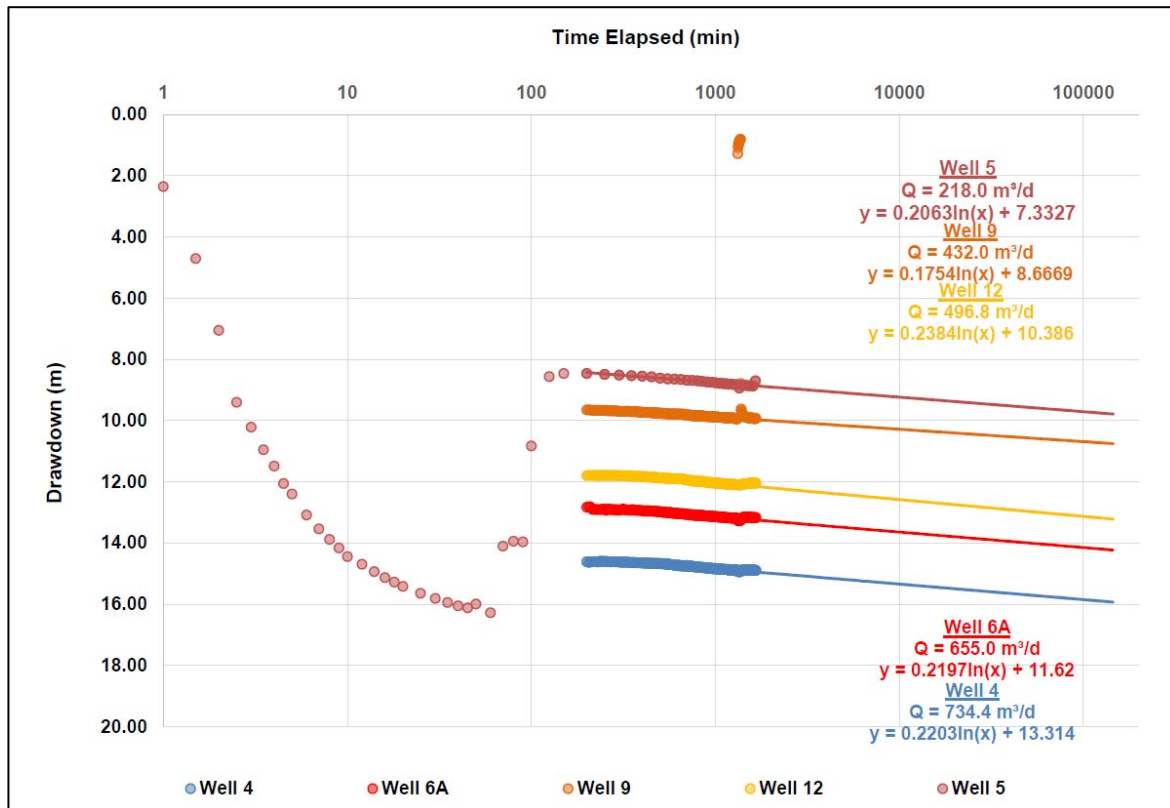


**Figure 2 – Groundwater Level vs Time during Wellfield Pump Test
11 am August 28, 2017 to 3 pm August 29, 2017**

(figure from *Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.*, dated September 21, 2017 by Lowen Hydrogeology Consulting Ltd.

The results from the pumping test were used to estimate the long-term combined pumping capacity of the existing wells totalling 2,380 m³/day as presented in the report titled *Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.*, dated September 21, 2017 by Lowen Hydrogeology Consulting Ltd. A copy of this letter report is in **Appendix C**.

The calculated long-term sustainable yield (2,380 m³/day) was based on the BC Ministry of Environment (1999) standard well rating formula which includes a 30% safety factor and extrapolation of the drawdown in groundwater level at each pump after 100 days of continuous pumping.

As shown in **Table 2**, the licenced maximum day withdrawal limit (1,425 m³/day) is less than the calculated long-term combined pumping capacity/sustainable yield.

Table 2 – Harby Rd Wellfield Capacity Review

Well No.	Wellfield Total Capacity ⁽¹⁾ m ³ /day
#4	539
#5	349
#6A	675
#9	434
#12	383
Total:	2,380
Max Day Licenced Limit ⁽²⁾ :	1,425
Difference (Surplus):	955 67 %

Notes:

- (1) As reported in *Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.*, letter report dated September 21, 2017 by Lowen Hydrogeology Consulting Ltd. and is based on:
 - Pump testing carried out starting on Aug 28, 2017 at 11 am to ending on Aug 29, 2017 at 3 pm.
 - 30% safety factor applied to the total available draw down for each well and extrapolation of groundwater level after 100 days of continuous pumping.
- (2) *Conditional Licence No. 503273* for the District's five (5) production wells (Harby Road wellfield) which withdraw water from Aquifer 215.

2.3.2 Wellfield Pump Risk/Redundancy Assessment

Of the five wells (#4, #5, #6A, #9, #12), Well #6A had the highest pumping capacity rating at 675 m³/day (29% of the combined total). If Well #6A, were to be temporarily out of service due to such things as: well pump and/or mechanical/electrical issues; system SCADA issues; O&M needs; the subtraction of its pumping capacity in **Table 2**, would reduce the wellfield total pumping rate to 1,705 m³/day. This is still 280 m³/day higher than the licenced withdrawal limit of 1,425 m³/day.

2.4 Wellfield Groundwater Levels

The daily water level recorded at the provincial government groundwater level monitoring well (No. 232) along with daily rainfall amount recorded at the nearest Environment Canada weather station (Nanaimo City Yard) is shown in **Figure 3**.

As can be seen in **Figure 3**, the groundwater level changes throughout the year, reaching the highest in the spring and dropping to the lowest in the summer.

**BC Groundwater Monitoring Well No. 232
(District of Lantzville Harby Road Wellfield)**

**Daily Water Level & Rainfall
Jan 1, 2014 - Apr 30, 2025**

Rainfall Data from Environment Canada
Nanaimo City Yard, Climate ID: 10253G0

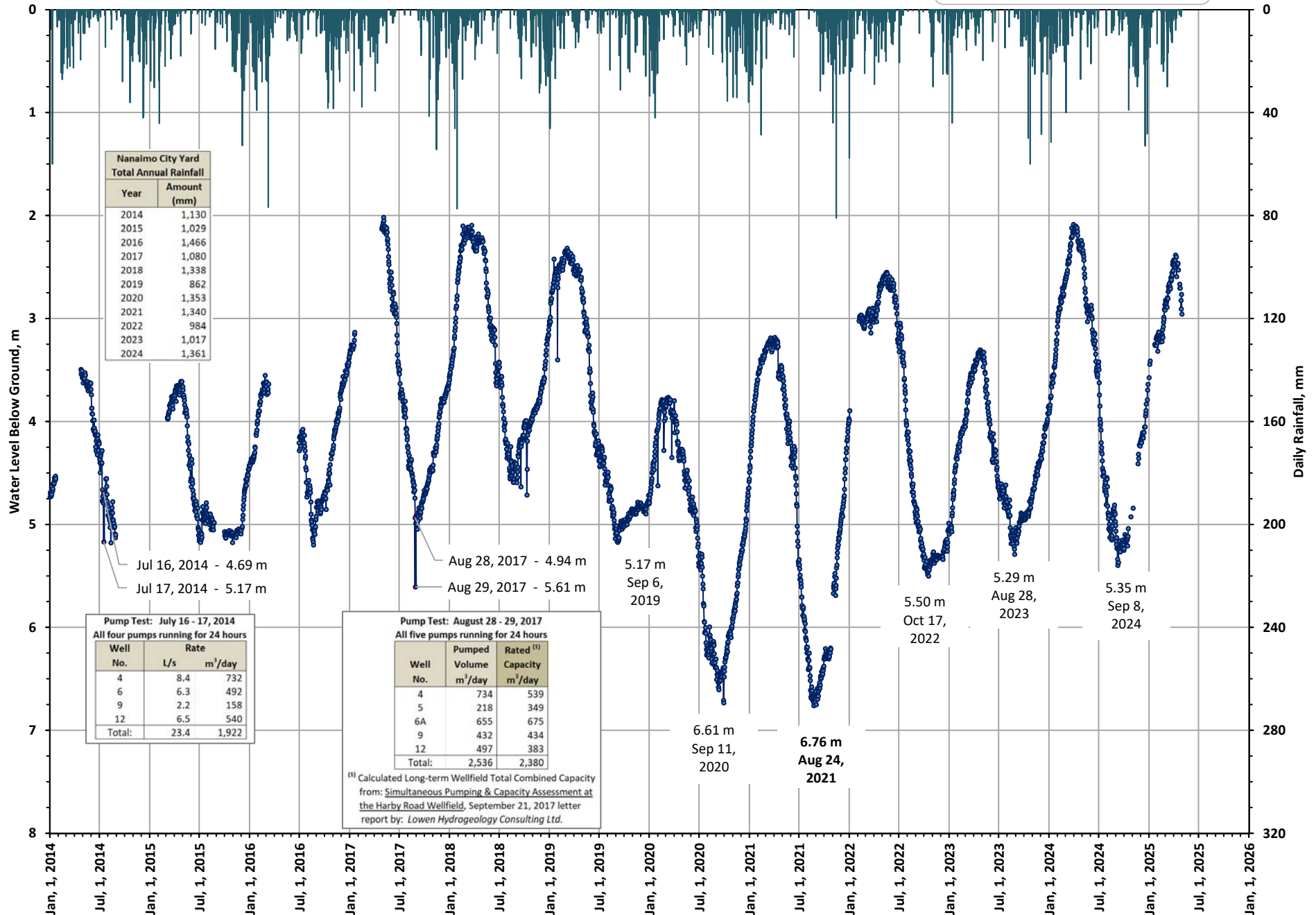


Table 3 presents the lowest recorded water level each year for the past eleven years (2014 to 2024).

Table 3 – Observation Well No. 232 Lowest Annual Water Level, 2014 - 2024

Year	Lowest Water Level (m)	Date			Total Rainfall Jan 1 – Dec 31 ⁽¹⁾ mm
		Aug	Sep	Oct	
2014 ⁽³⁾	5.13	28			1,130
2015 ⁽⁴⁾	5.18			30	1,029
2016	5.20	21			1,466 ⁽²⁾
2017 ⁽⁵⁾	5.05		5		1,080
2018	4.60 ⁽²⁾		4		1,338
2019	5.17		6		862 ⁽²⁾
2020	6.61		11		1,353
2021 ⁽⁶⁾	6.76 ⁽²⁾	24			1,340
2022 ⁽⁷⁾	5.50			17	984
2023 ⁽⁸⁾	5.29	28			1,017
2024	5.35		8		1,361

Notes:

Bold red text indicates the **highest value** of all the years shown in the table.

Bold blue text indicates the **lowest value** of all the years shown in the table.

- (1) Rainfall data from Environment Canada Nanaimo City Yard, Climate ID: 10253G0.
- (2) It is noted that the lowest and highest groundwater levels occurred two years after the lowest and highest annual rainfall amounts.
- (3) **Year 2014**, incomplete data. No recordings after August 29.
- (4) **Year 2015**, incomplete data. No recordings from Aug 24 to Sep 30.
- (5) **Year 2017**, Wellfield pumping capacity test carried out starting at 11 am Aug 28 and ending at 3 pm Aug 29. During the pump test, a water level of 4.94 m was recorded on Aug 28 and a level of 5.61 m on Aug 29, both at 12 noon.
- (6) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (7) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (8) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep).

As shown in **Figure 3**, notably lower groundwater levels than those during the Year 2017 well pumping test were recorded over the following three consecutive years:

- Year 2020 (1.56 m lower),
- Year 2021 (1.71 m lower), and
- Year 2022 (0.45 m lower).

3 WATER USAGE

A summary of the total annual, average day and maximum day volumes extracted from the Wellfield over the past 11 years (2013 – 2023) is presented in **Table 4**.

Table 4 – Annual, Average Day & Maximum Day Wellfield Extraction, 2013 - 2023

Year	Annual Volume m³	Average Day m³/day	Maximum Day				Max/Ave Ratio
			m³/day	date			
				Jun	Jul	Aug	
2013	225,998	619	1,103		28		1.99
2014	232,984	638	1,407			13	2.23
2015	224,537	615	1,165	8			1.89
2016	224,587	614	1,093			19	1.78
2017	233,028	638	1,316			4	2.06
2018	222,427	609	1,243		30		2.04
2019	250,628	687	1,288	20			1.88
2020 ⁽¹⁾	283,871	776	1,441		27		1.86
2021 ⁽²⁾	273,677	750	1,618	29			2.16
2022 ⁽³⁾	278,822	764	1,424			19	1.86
2023 ⁽⁴⁾	250,234	686	1,331	6			1.94
Average	245,527	672	1,325				1.97

Notes:

Bold blue text indicates the **lowest value** of all the years shown in the table.

Bold black text indicates the **highest value** of all the years shown in the table.

Red text indicates extraction volume exceeds the licenced annual withdrawal limit (260,000 m³/year) from the date the licence was issued (April 30, 2021).

- (1) **Year 2020**, comments in the District spreadsheet data state this includes the volume of water used for compaction, testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (2) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (3) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (4) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.

The **Table 4** data shows total annual demand for Year 2020, 2021, and 2022 to be approximately 10% higher than the Year 2019 and Year 2023. It is suspected that was in part due to construction of the Phase III sewers in Year 2020, the heat dome that occurred across BC from end of June to the middle of July 2021, and the dry spring and very dry summer and fall in Year 2022.

The **Table 4** data shows that the maximum day demand for the past eleven years occur in the month of June, July or August, and the Maximum Day demand was almost double (1.97) of the Average Day demand.

The total annual, average day, and maximum day extractions from the Harby Road Wellfield for the past 20 years is presented in **Figure 4**.

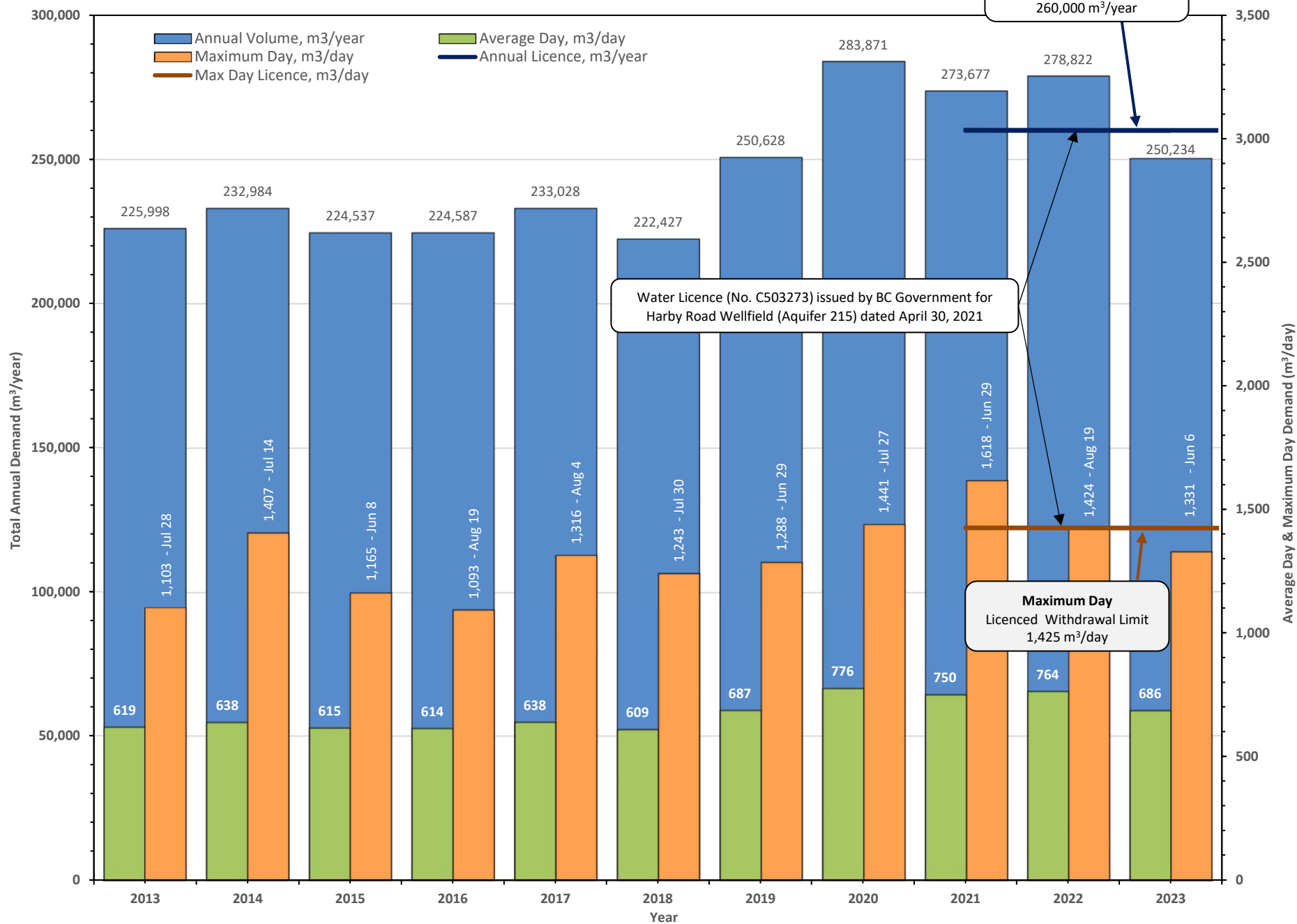
The monthly extraction volumes and the daily extraction volumes for the past 10 years is presented in **Figure 5** and **Figure 6**; respectively.

Figure 5 shows that:

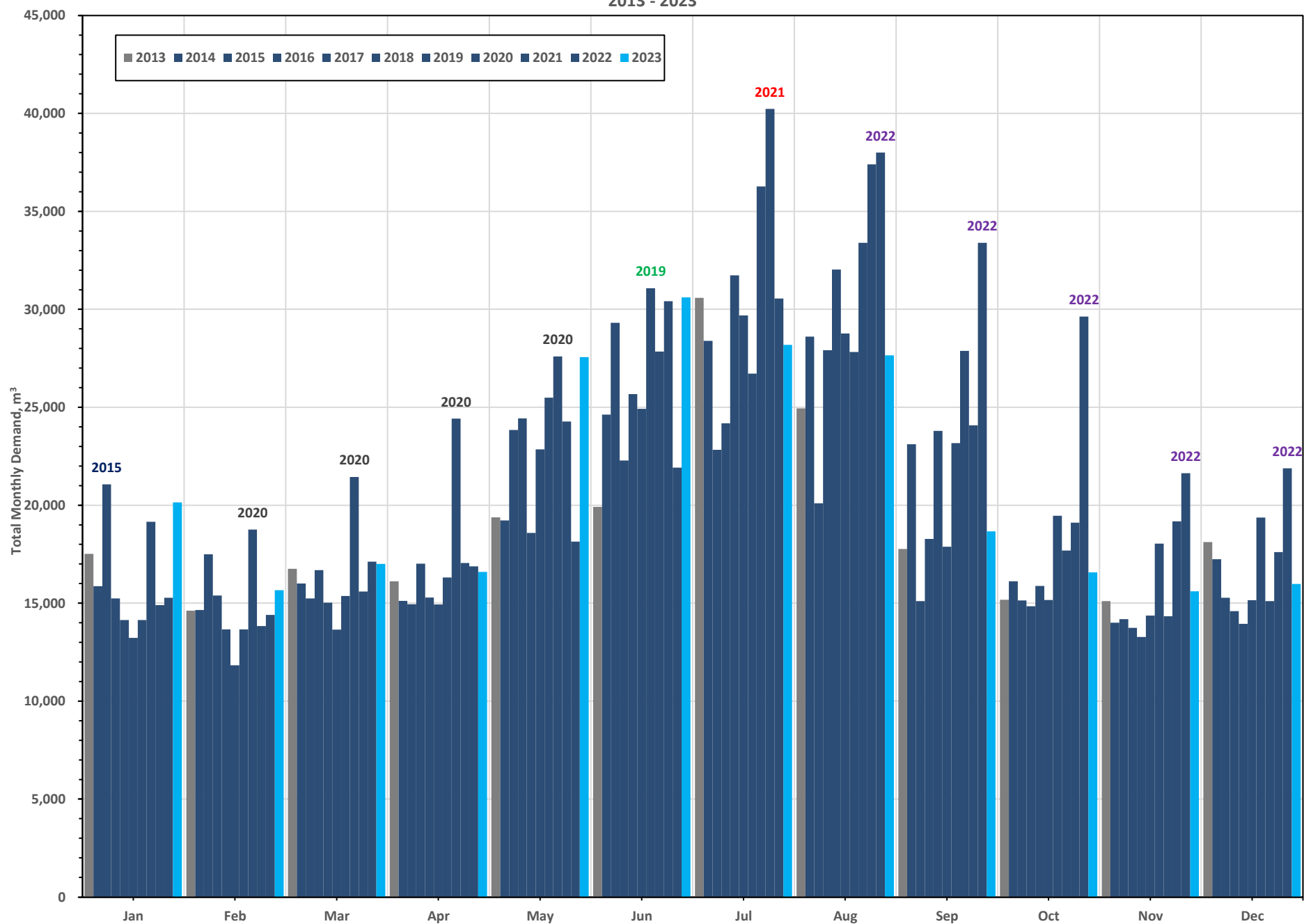
- the highest monthly demand occurred in July 2021.
- Year 2022 recorded the highest monthly demand for the five-month period of August thru December, which corresponds with the very dry summer and fall (August thru November).
- Year 2020 recorded the highest monthly demand for the four-month period of February thru May. The exact cause for these increased demands during this period could not be determined from the information available at the time of the preparation of this report.

Other factors that would influence higher water use include the addition of more single family lots created by new development within the District. As the newer developments come online more houses have been built, which creates more demand. Demand will continue to grow as existing vacant lots are developed, and new houses are brought on-line.

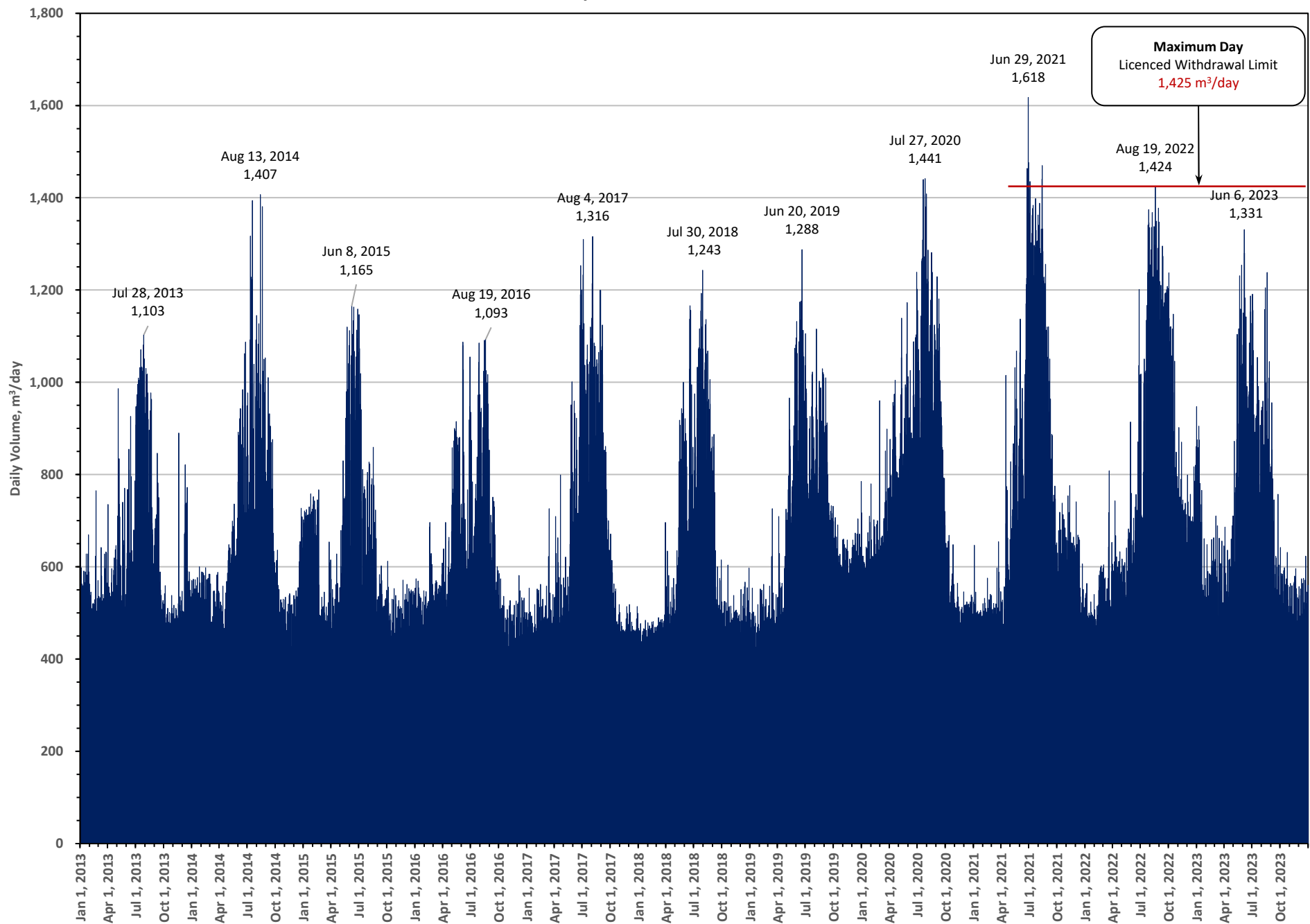
**District of Lantzville
Harby Road Wellfield
Total Annual, Average & Maximum Day Extraction, 2013 - 2023**



**District of Lantzville
Harby Road Wellfield Monthly Extraction
2013 - 2023**



**District of Lantzville
Harby Rd Wellfield
Daily Extraction, 2013 - 2023**



4 NON-REVENUE WATER

4.1 Definition & Calculation

Water usage in a water system can be divided into two categories, Revenue Water and Non-Revenue Water which are defined as:

- Revenue Water: Water that is metered and paid for
- Non-Revenue Water: Water that is used and not paid for

Non-Revenue water is made up of three components:

- *Unbilled Authorized Consumption + Apparent Losses + Real Losses*

The water used in each of these three categories can be partitioned into several sub-categories as noted below:

Unbilled Authorized Consumption

- Watermain flushing and general construction
- Sewer main flushing
- Fire department training and fire fighting
- Public boulevard and playfield irrigation

Apparent Losses

- Water theft
- Metering Inaccuracies

Real Losses

- Leakage on transmission mains and distribution mains
- Leakage on service connections before the customer's meter

As water systems age, *Real Losses* (leakage) increase in response to several factors, such as, but not limited to:

- gaskets on joints hardening and becoming brittle and more susceptible to leaking
- pipe material weakening, notably on direct tap service connections on AC pipe
- pipe strength weakening. For AC pipe this notably occurs in areas where the outside of the pipe comes in contact with groundwater or where the water inside the pipe is aggressive, resulting in a reduction in the thickness of the pipe wall
- Inadequate or improper bedding material used when the pipe was installed resulting in rocks or trench rock pressing onto the outside of the pipe wall, causing a localized pressure point, that overtime can create a crack in the pipe wall
- Earthquakes, which disturb the "settled" state of the water system and cause disruption/movement at pipe joints, service connections, tees, valves, fittings and other appurtenances, resulting in a loss of the integrity of the seal of the gasket at these locations

For a universally metered water system, the Non-Revenue Water Demand can be calculated using the following equation:

$$\text{Non-Revenue Water} = \text{Bulk Meter} - \text{All Individual Meters}$$

4.2 District of Lantzville

The calculated amount of Non-Revenue Water for each year for the past eleven (11) years for the District of Lantzville is presented in **Table 5** and graphically shown in **Figure 7**.

Table 5 – Annual Wellfield Extraction vs Individual Meter Demand, 2013 - 2023

Year	Total		Non-Revenue Water (Wellfield – Ind. Meters)	
	Wellfield m ³	Individual Meters m ³	m ³	%
2013	225,998	195,048	30,950	14 %
2014	232,984	196,085	36,889	16 %
2015	224,537	n/a	-	-
2016	224,587	217,975	6,612 ⁽¹⁾	3 % ⁽¹⁾
2017	233,028	204,933	28,095	12 %
2018	222,427	199,336	23,091	10 %
2019	250,628 ⁽²⁾	198,743	51,885 ⁽²⁾	21 % ⁽²⁾
2020	283,871 ⁽³⁾	195,260	88,611 ⁽³⁾	31 % ⁽³⁾
2021 ⁽⁴⁾	273,677	243,666	30,011	11 %
2022 ⁽⁵⁾	278,822	229,448	49,374	18 %
2023 ⁽⁶⁾	250,234	220,497	29,737	12 %
Average ⁽⁷⁾	247,626	210,099	37,527	15 %

Notes:

Bold blue text indicates the **lowest value** of all the years shown in the table.

Bold black text indicates the **highest value** of all the years shown in the table.

Red text indicates extraction volume exceeds the licenced annual withdrawal limit (260,000 m³/year) from the date the licence was issued (April 30, 2021).

- (1) **Year 2016** difference is notably low.
- (2) **Year 2019** difference is more than double to the previous year even though the total of the individual metered demand was slightly lower than the previous year. The reason for this could not be determined from the information available.
- (3) **Year 2020** demand was notably higher (13%) compared to the previous year even though the total of the individual metered demand again declined. It is reported that some of the increase was due to the volume of water used for testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (4) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (5) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (6) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a

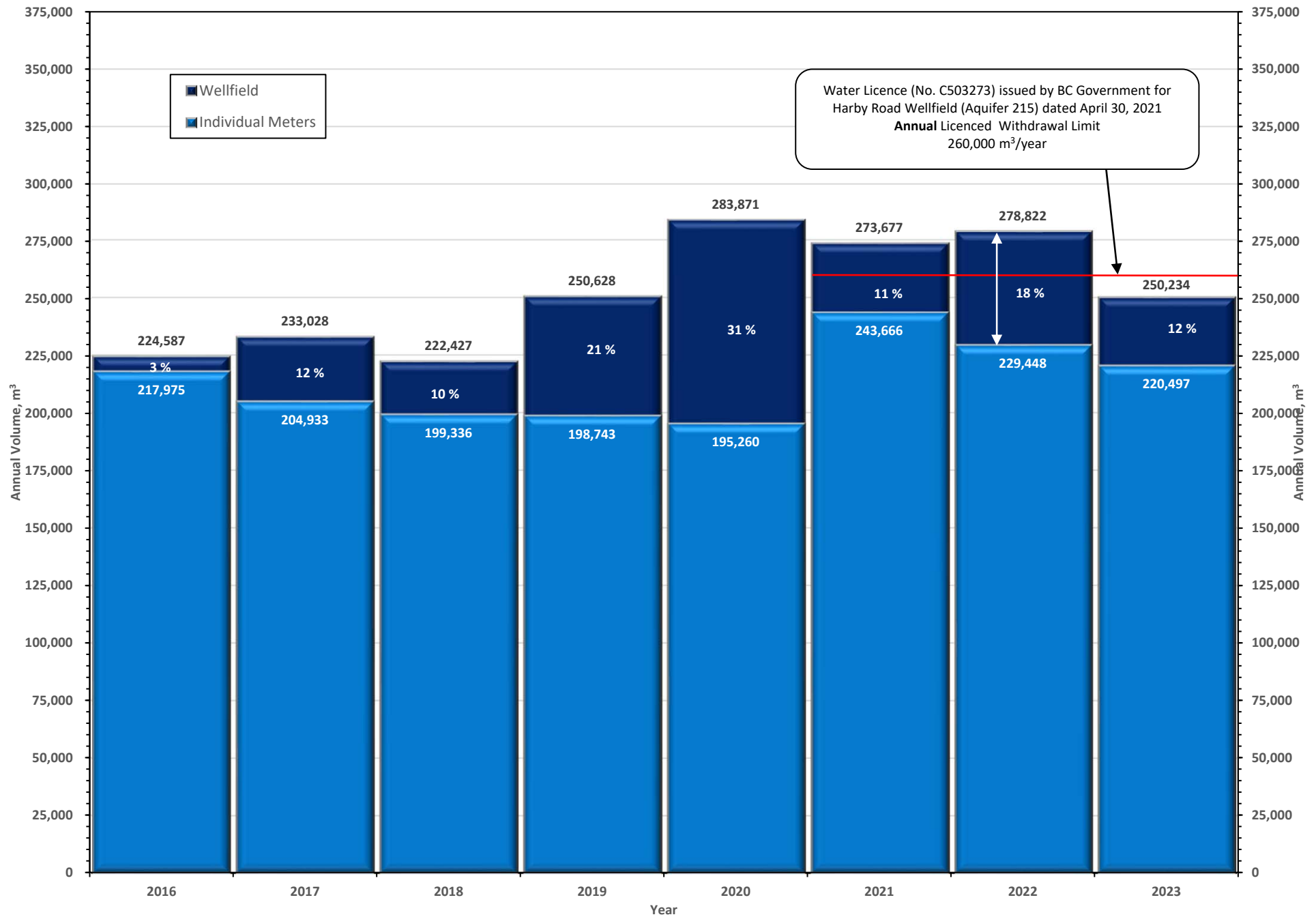
total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.

(7) Not including Year 2015.

As Non-Revenue Water is comprised of *Unbilled Authorized Consumption + Apparent Losses + Real Losses*, the elimination of Non-Revenue water is not possible. However, the monitoring and reduction of Non-Revenue Water is an important part of the operation and maintenance of a water system.

As shown in **Table 5**, the amount of Non-Revenue Water over the past eleven (11) year, not including Year 2015, has averaged 15% of the Wellfield pumped volume. This is within the expected range of 15% to 25% for the District's water system based on its size, age, distribution system pipe materials, and system static pressures.

Wellfield Annual Extraction vs Individual Meters Total Volumes 2016 - 2023



5 PER CONNECTION WATER DEMANDS

5.1 Historical & Design Standard

A comparison of the calculated demand per connection based on the average day and maximum day pumped volumes from the Wellfield to the District's design demands for a Single Family, 1/2 acre parcel, for the past five (5) years is presented in **Table 6**.

Table 6 – Per Connection Demand: Historical (2019 – 2023) vs Bylaw No. 226

Description	Year					5 Year Average
	2019	2020 ⁽¹⁾	2021 ⁽²⁾	2022 ⁽³⁾	2023 ⁽⁴⁾	
Wellfield Extraction & No. of Connections						
Annual m³/year	250,628	283,871	273,677	278,822	250,234	267,450
Average Day m³/day	687	776	750	764	686	730
Maximum Day m³/day	1,288	1,441	1,681	1,424	1,331	1,435
No. of Connections ⁽⁵⁾ #	901	905	912	920	922	912
Per Connection: Average Day Demand L/day per Connection						
Average Day ^(5, 6)	760	860	820	830	745	805
Bylaw No. 226 ⁽⁷⁾	1,300	1,300	1,300	1,300	1,300	1,300
Average Day as percentage of Bylaw No. 226	58 %	66 %	63 %	64 %	57 %	62 %
Per Connection: Maximum Day Demand L/day per Connection						
Maximum Day ^(5, 6)	1,430	1,590	1,845	1,550	1,445	1,570
Bylaw No. 226 ⁽⁷⁾	2,320	2,320	2,320	2,320	2,320	2,320
Maximum Day as percentage of Bylaw No. 226	62 %	68 %	79 %	67 %	62 %	68 %

Notes:

Bold blue text indicates the **lowest per connection demand** for the five years. **Bold black text** indicates the **highest per connection demand** for the five years.

Bold red text indicates extraction volume exceeds the licenced withdrawal limit from the date the licence was issued (April 30, 2021):

- Total Annual Licenced Withdrawal Limit: 260,000 m³/year
- Maximum Day Licenced Withdrawal Limit: 1,425 m³/day

- (1) **Year 2020**, comments in the District spreadsheet data state this includes the volume of water used for testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (2) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (3) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (4) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is

understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.

- (5) The number of properties serviced from the Harby Road wellfield has increased over the last five years as new houses are constructed in the recent developments approved by the District. The number of connections and overall demand is expected to rise as newer houses are built on lots that are currently vacant.
- (6) Rounded to nearest 5 L/day per connection.
- (7) Bylaw No. 226, Schedule "B" includes varying residential per connection design demands based on land use. Average Day and Maximum Day demands range from a low of 760 and 1,425 L/day per connection (Assisted Living, 3-4 storey) to a high of 1,350 and 2,400 L/day per connection (Single Family, 1 acre). The values shown (1,300 and 2,320 L/day per connection) are for Single Family, 1/2 acre (see [Appendix D](#)).

As shown in [Table 6](#):

- the calculated per connection Average Day and Maximum Day demand for the past five years (2019-2023) were lower than the Bylaw No. 226 per connection design demand for a Single Family, 1/2 acre parcel.
- **Year 2020** had the Highest Average Day demand per connection, equating to 66 % of the Bylaw No. 226 per connection design demand for a Single Family, 1/2 acre parcel.
- **Year 2021** had the Highest Maximum Day demand per connection, equating to 79 % of the Bylaw No. 226 per connection design demand for a Single Family, 1/2 acre parcel.
- **Year 2023** had the Lowest Average Day demand per connection, equating to 57 % of the Bylaw No. 226 per connection design demand for a Single Family, 1/2 acre parcel.
- **Year 2019** had the Lowest Maximum Day demand per connection, equating to 62 % of the Bylaw No. 226 per connection design demand for a Single Family, 1/2 acre parcel.

6 NUMBER OF PROPERTIES SERVED

An assessment of the number of properties that could potentially be serviced by the Harby Road wellfield was carried out for three extraction rate scenarios:

- Water Licence Withdrawal Limits
- Year 2017 Wellfield Capacity Rating
- Year 2017 Wellfield Capacity Rating with Largest Pump not in Service

The assessment was carried out using the following Average Day and Maximum Day per connection demands based on:

- Design standards from Bylaw No. 226 for Single Family, 1/2 acre parcel
- Each year of the past five years (2019 - 2023)

6.1 Maximum Day Demand

The number of possible properties serviced by the Harby Road Wellfield based on Bylaw No. 226 Maximum Day design standard for Single Family, ½ acre parcel when applied to varying pumped volumes is presented in **Table 7** and graphically shown in **Figure 8**, **Figure 9**, and **Figure 10**.

The number of possible properties serviced by the Harby Road Wellfield based on historical per connection Maximum Day demands for the past five years when applied to varying pumped volumes is presented in **Table 7** and graphically shown in **Figure 8**, **Figure 9**, and **Figure 10**.

Table 7 – Number of Properties Serviced for Varying Pumped Volumes & Per Connection Demand (Maximum Day Demand Conditions)

Maximum Day Demand Per Connection				Number of Properties Serviced ⁽¹⁾ based on Wellfield Capacity Volume of:		
Source	Max Day m ³ /day	No. of Connections	m ³ /day per Connection	1,425 ⁽²⁾ m ³ /day	1,705 ⁽³⁾ m ³ /day	2,380 ⁽⁴⁾ m ³ /day
Bylaw No. 226 ⁽⁵⁾	---	---	2.32	615	735	1,025
Year 2019	1,288	901	1.43	995	1,190	1,665
Year 2020 ⁽⁶⁾	1,441	905	1.59	895	1,070	1,495
Year 2021 ⁽⁷⁾	1,618	912	1.77	805	960	1,340
Year 2022 ⁽⁸⁾	1,424	920	1.55	920	1,100	1,535
Year 2023 ⁽⁹⁾	1,331	922	1.44	990	1,180	1,650
Difference Between Calculated Number of Properties and 922 Properties Serviced ⁽¹⁰⁾						
	Bylaw No 226			-307	-137	103
	Year 2019			73	268	743
	Year 2020			-27	148	573
	Year 2021			-117	38	418
	Year 2022			-2	178	613
	Year 2023			68	258	728

Notes:

Tan shading indicates the calculated number of properties that could be serviced by the Harby Road Wellfield is less than the Year 2023 total of 922 properties.

Green shading indicates the calculated number of properties serviced by the Harby Road

Wellfield is more than the Year 2023 total of 922 properties.

- (1) Calculated number of properties serviced based on wellfield volume rounded to nearest five (5).
- (2) 1,425 m³/day. Maximum Day Withdrawal Limit as per the *Conditional Licence No. 503273* for the District's five (5) production wells (Harby Road wellfield) which withdraw water from Aquifer 215.
- (3) 1,705 m³/day. System risk/redundancy assessment: Allowing for largest producing well (#6A) to be temporarily out of service due to such things as: well pump and/or motor mechanical/electrical issues, system SCADA issues, O&M needs (see [Table 3](#)).
- (4) 2,380 m³/day. Harby Road Wellfield Long-term Sustainable Yield as reported in *Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.*, letter report dated September 21, 2017 by Lowen Hydrogeology Consulting Ltd. and is based on:
 - Pump testing carried out starting on Aug 28, 2017 at 11 am to ending on Aug 29, 2017 at 3 pm.
 - 30% safety factor applied to the total available draw down for each well.
- (5) Bylaw No. 226, Schedule "B" includes varying residential per connection design demands based on land use. Maximum Day demand ranges from 1.425 m³/day per connection (Assisted Living, 3 - 4 storey) to 2.4 m³/day per connection (Single Family, 1 acre). A copy of the bylaw is located in [Appendix D](#).
- (6) **Year 2020**, comments in the District spreadsheet data state this includes the volume of water used for testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (7) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (8) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (9) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.
- (10) These values do not include houses that have not yet been built on existing lots with a water service that have been approved by the District. These values do not include any allowance to supply water to the Foothills development in the event that the Foothills well is offline or under-producing.

The findings of the Maximum Day demand analyses presented in **Table 7** indicate:

- There is a wide range of the potential number of properties that could be serviced from the wellfield depending on the per connection design demand and the assumed volume of water pumped from the wellfield.
- Based on the licenced withdrawal limit (1,425 m³/day):
 - i) the calculated maximum number of properties serviced ranged from **615** to 995. This compares to the 922 properties serviced in 2023.
 - ii) the calculated number of additional properties that could potentially be serviced beyond the 922 properties serviced in 2023, ranges from **-307** to 73.

6.2 Average Day Demand

The number of possible properties serviced by the Harby Road Wellfield based on Bylaw No. 226 Average Day design standard for Single Family, ½ acre parcel when applied to varying pumped volumes is presented in **Table 8** and graphically shown in **Figure 8**, **Figure 9**, and **Figure 10**.

The number of possible properties serviced by the Harby Road Wellfield based on historical per connection Average Day demands for the past five years when applied to varying pumped volumes is presented in **Table 8** and graphically shown in **Figure 8**, **Figure 9**, and **Figure 10**.

Table 8 – Number of Properties Serviced for Varying Pumped Volumes & Per Connection Demand (Average Day Demand Conditions)

Average Day Demand Per Connection				Number of Properties Serviced ⁽¹⁾ based on Wellfield Daily Capacity Volume of:		
Source	Ave Day m ³ /day	No. of Connections	m ³ /day per Connection	712.5 ⁽²⁾ m ³ /day	852.5 ⁽³⁾ m ³ /day	1,190 ⁽⁴⁾ m ³ /day
Bylaw No. 226 ⁽⁵⁾	---	---	1.300	550	655	915
Year 2019	687	901	0.760	935	1,120	1,560
Year 2020 ⁽⁶⁾	776	905	0.860	830	995	1,390
Year 2021 ⁽⁷⁾	750	912	0.820	865	1,035	1,450
Year 2022 ⁽⁸⁾	764	920	0.830	860	1,025	1,435
Year 2023 ⁽⁹⁾	686	922	0.745	960	1,145	1,600
Difference Between Calculated Number of Properties and 922 Properties Serviced ⁽¹⁰⁾						
	Bylaw No 226			-372	-267	-7
	Year 2019			13	198	638
	Year 2020			-92	73	468
	Year 2021			-57	113	528
	Year 2022			-62	103	513
	Year 2023			38	223	678

Notes:

Tan shading indicates the calculated number of properties that could be serviced by the Harby Road Wellfield is less than the Year 2023 total of 922 properties.

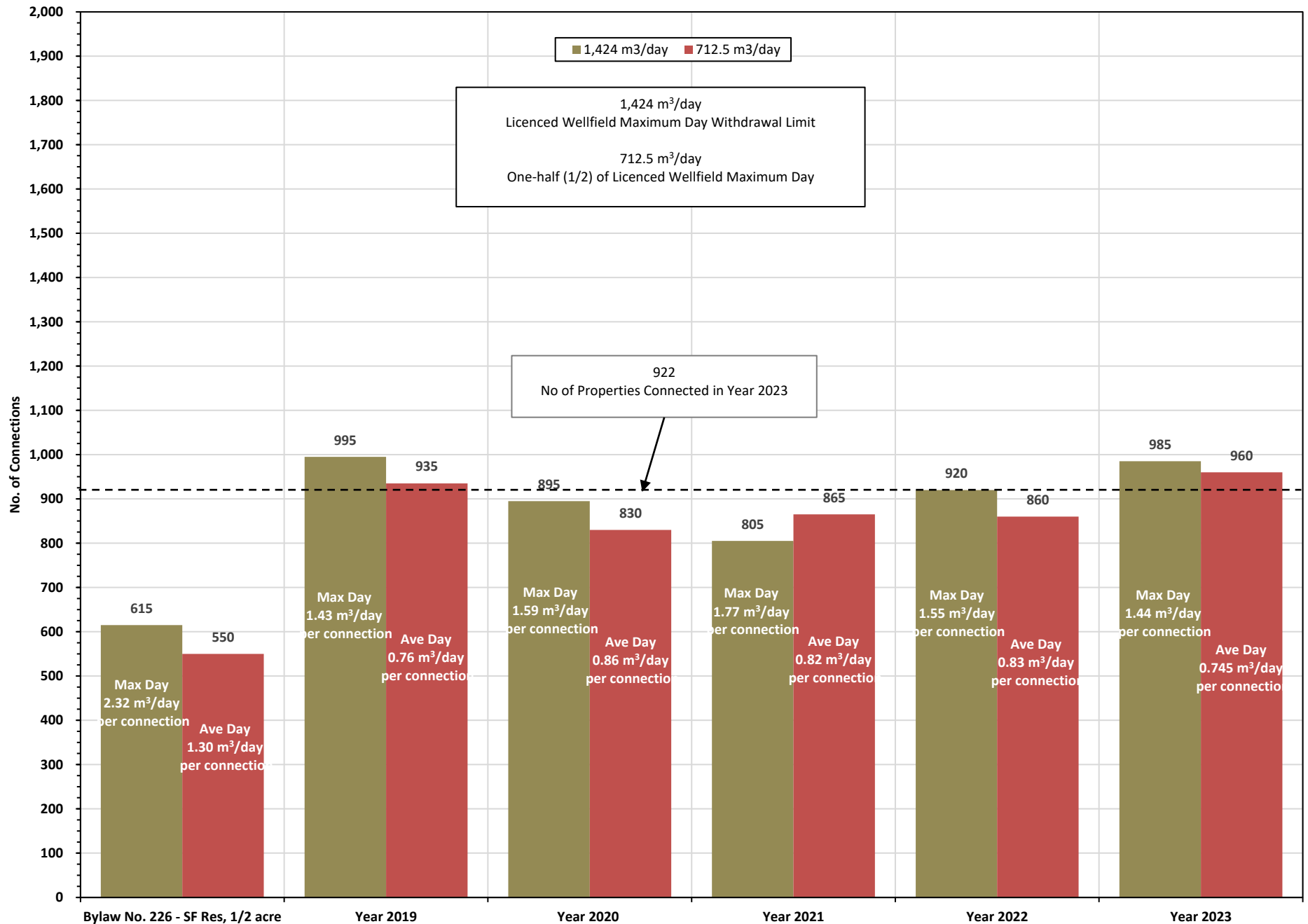
Green shading indicates the calculated number of properties serviced by the Harby Road Wellfield is more than the Year 2023 total of 922 properties.

- (1) Calculated number of properties serviced based on wellfield volume rounded to nearest five (5).
- (2) 712.5 m³/day. Based on *Conditional Licence No. 503273* which allows for a maximum annual extraction volume of 260,000 m³/year, which equates to an average daily volume of 712.5 m³/day and is one-half (1/2) of the licenced maximum day withdrawal limit (1,425 m³/day).
- (3) 852.5 m³/day. System risk/redundancy assessment: Allowing for largest producing well (#6A) to be temporarily out of service due to such things as: well pump and/or motor mechanical/electrical issues, system SCADA issues, O&M needs and the remaining four wells pumping at one-half (1/2) of their Long-term Sustainable Yield (see [Table 3](#)).
- (4) 1,190 m³/day. One half (1/2) of the Harby Road Wellfield Long-term Sustainable Yield reported in *Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.*, letter report dated September 21, 2017 by Lowen Hydrogeology Consulting Ltd.
- (5) Bylaw No. 226, Schedule "B" includes varying residential per connection design demands based on land use. Average Day demand ranges from 0.760 m³/day per connection (Multi-Family; Townhouse; & Assisted Living, 3-4 storey) to 1.350 m³/day per connection (Single Family, 1 acre). A copy of the bylaw is located in [Appendix D](#).
- (6) **Year 2020**, comments in the District spreadsheet data state this includes the volume of water used for testing and flushing as part of the completion of the Phase III sanitary sewer system.
- (7) **Year 2021**, Heat dome was experienced across BC from end of June to middle of July.
- (8) **Year 2022**, Dry spring (Feb-Mar) with very dry summer and fall (Aug-Nov).
- (9) **Year 2023**, Dry spring (Feb-Mar) with very dry summer (May-Sep). The water supply connection to the City of Nanaimo was opened on May 15, 2023 and a total usage of 27,426 m³ was recorded over the next four months (mid May to mid Sep). It is understood the Nanaimo connection was opened in response to concerns about possible cavitation on the District's water supply pumps (Harby Road wellfield) due to persistent low water levels (less than 1 m over the pumps) when the pumps were running. Water obtained from the City of Nanaimo flows into the Harwood Reservoir. Beginning on July 25, 2023 and going until mid September, water was pumped several times a day from the Harwood Reservoir into the Foothills Reservoir as the Foothills well was not able to keep up with the demand. It is reported that during this time the Foothills well was experiencing very low water levels over the pump, and the well pump had been running continuously for two weeks trying to fill the reservoir.
- (10) These values do not include houses that have not yet been built on existing lots with a water service that have been approved by the District. These values do not include any allowance to supply water to the Foothills development in the event that the Foothills well is offline or under-producing.

The findings of the Average Day demand analyses presented in **Table 8** indicate:

- There is a wide range of the potential number of properties that could be serviced from the wellfield depending on the per connection design demand and the assumed volume of water pumped from the wellfield.
- Based on the annual licenced withdrawal limit of 260,000 m³/day, which equates to an average day withdrawal of 712.5 m³/day:
 - i) the calculated maximum number of properties serviced ranged from **550** to 960. This compares to the 922 properties serviced in the Year 2023.
 - ii) the calculated number of additional properties that could potentially be serviced beyond the 922 properties serviced in 2023, ranged from **-372** to 38.

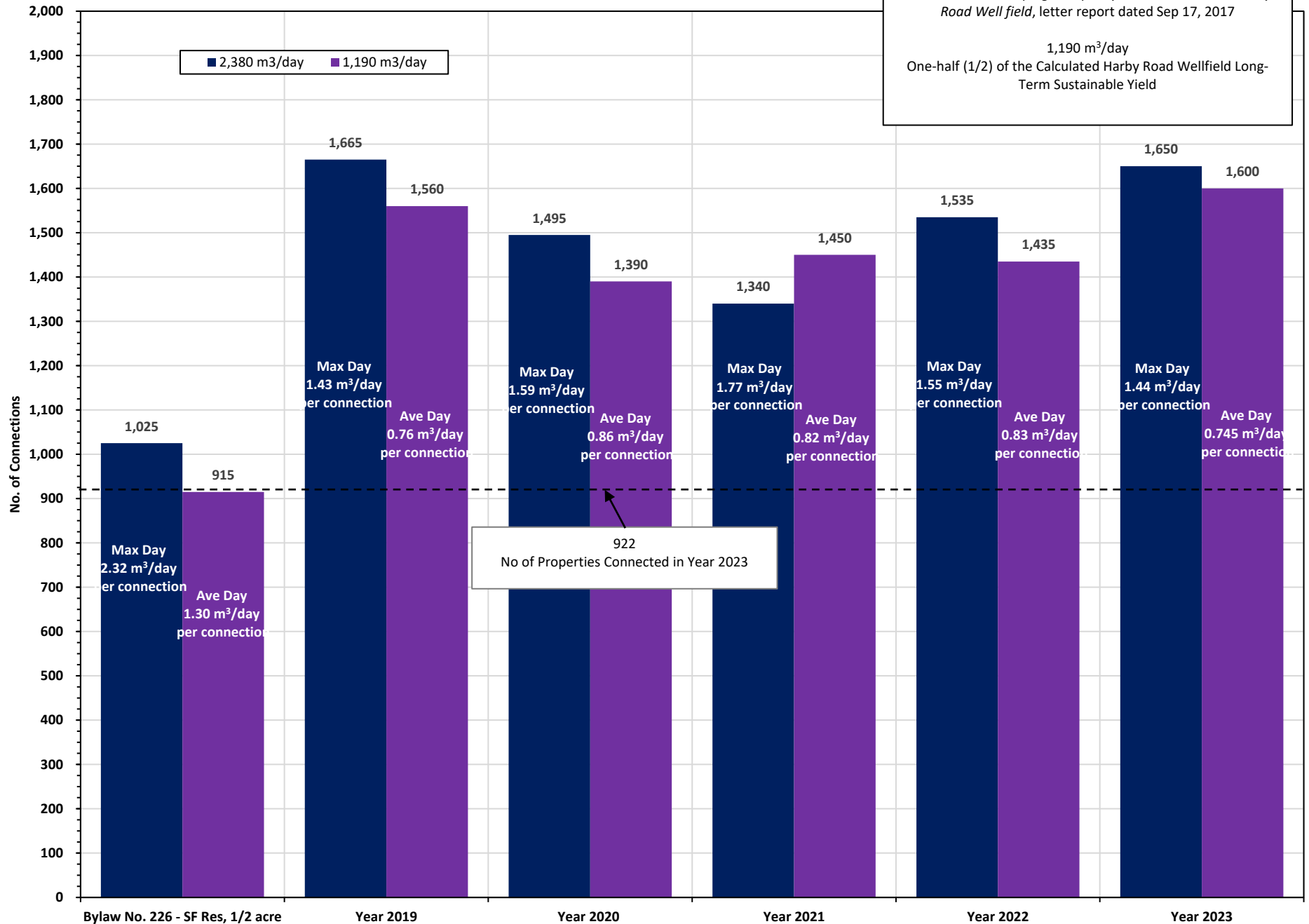
**Calculated Number of Properties Served by Wellfield
based on Pumped Volumes of
1,424 m³/day (Max Day) & 712.5 m³/day (Ave Day)**



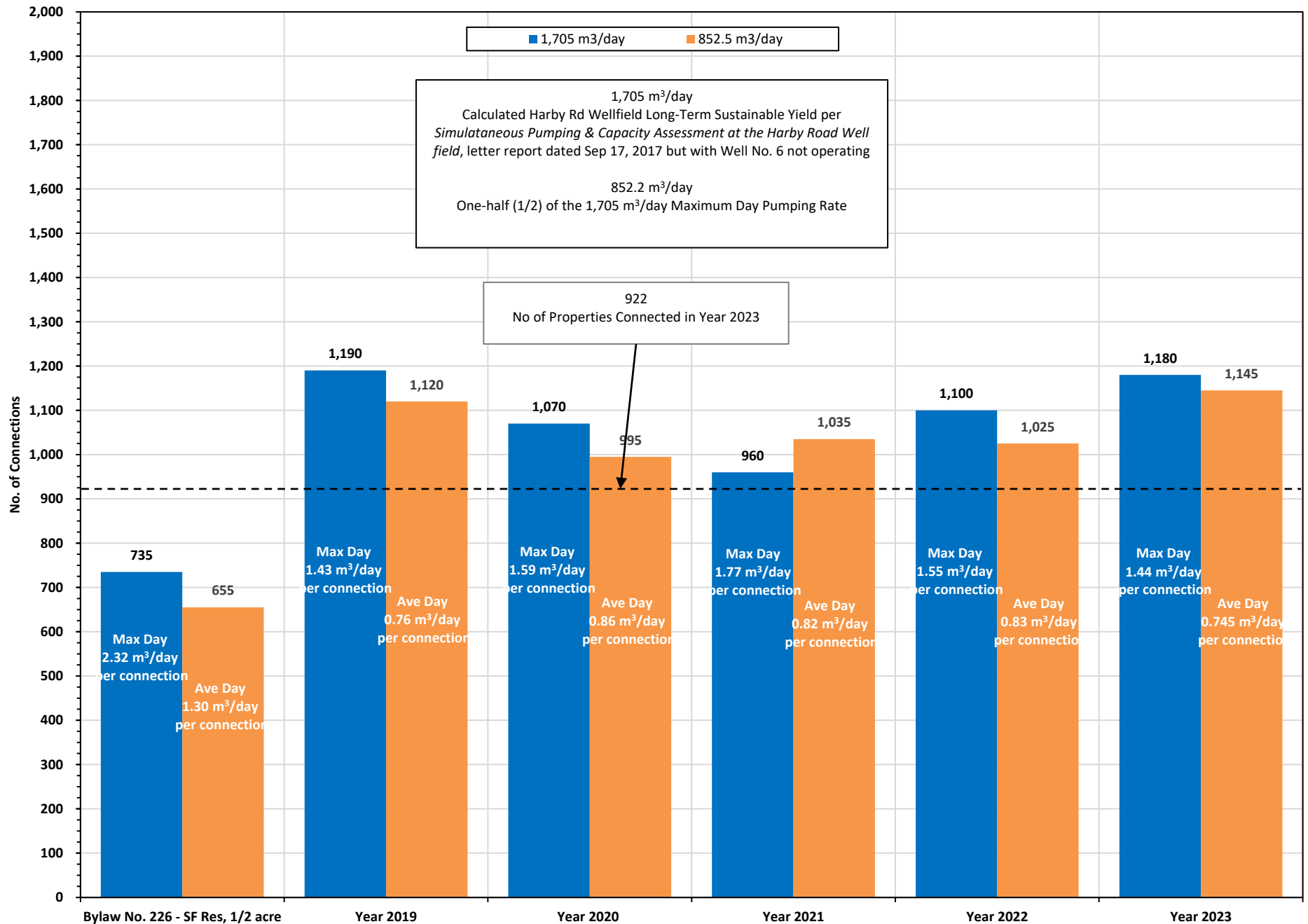
**Calculated Number of Properties Served by Wellfield
based on Pumped Volumes of
2,380 m³/day (Max Day) & 1,190 m³/day (Ave Day)**

2,380 m³/day
Calculated Harby Rd Wellfield Long-Term Sustainable Yield per
*Simultaneous Pumping & Capacity Assessment at the Harby
Road Well field*, letter report dated Sep 17, 2017

1,190 m³/day
One-half (1/2) of the Calculated Harby Road Wellfield Long-
Term Sustainable Yield



**Calculated Number of Properties Serviced by Wellfield
based on Pumped Volumes of
1,705 m³/day (Max Day) & 852.5 m³/day (Ave Day)**



7 CONCLUSIONS

The following conclusions are made from the findings in this report:

Wellfield Licenced Withdrawal Limits & Exceedances

- 1 The District of Lantzville is authorized to extract/withdraw water from Aquifer No. 215 by the District ground water supply wells at the Harby Road Wellfield as follows:
 - Maximum Day Licenced Withdrawal Limit: 1,425 m³/day
 - Total Annual Licenced Withdrawal Limit: 260,000 m³/day
- 2 Since issuance of the Water Licence in Year 2021, the Licenced Withdrawal Limits have been exceeded three times:
 - Maximum Day Exceedance: Year 2021
 - Total Annual Exceedance: Year 2021 & Year 2022

It is noted that in Year 2021, a heat dome was experienced across BC from the end of June to the middle of July. In Year 2022, there was a dry spring (Feb - Mar) followed by a very dry summer and fall (Aug - Nov).

Year 2017 Wellfield Capacity Rating and Groundwater Levels

- 3 In August 2017, the combined Long-Term Sustainable Yield of the District's five water supply wells was calculated to be: 2,380 m³/day, which is 955 m³/day more than the maximum day licenced withdrawal limit (1,425 m³/day).
- 4 The Year 2017 rating was based on 24 hours of continuous pumping of all five wells and calculated using the BC Ministry of Environment (1999) standard rating formula which includes a 30% safety factor and extrapolation of the drawdown in groundwater level at each pump after 100 days of continuous pumping.
- 5 Groundwater levels in the wellfield change throughout the year, reaching the highest in the spring and dropping to the lowest in the summer.
- 6 In Year 2017, the lowest groundwater level recorded at the BC Ministry of Environment groundwater level monitoring well No. 232, which is located very close to the District's wellfield (**Figure 1**) was 5.05 m below ground level, not including the period of 24-hour continuous pumping of all five wells (August 28 & 29 when the water level dropped to 5.61 m (**Figure 3**). Notably lower groundwater levels than these were recorded in Year 2020 (6.61 m), Year 2021 (6.76 m) and Year 2022 (5.50 m) as shown in **Figure 3** and **Table 3**.

Maximum Day vs Average Day Demand

- 7 Over the past eleven years (2013 – 2023), the Maximum Day demand has averaged 1,325 m³/day compared to an average day demand of 672 m³/day. This equates to the Maximum Day demand being double (1.97 times) the Average Day demand.
- 8 The District adopted Bylaw No. 226 in Year 2020 establishing a maximum day design standard of 2,320 L/day per connection for a ½ acre Single Family lot. This is lower than the 2,900 L/day per connection recommended in our May 2016 Water Demand Design Standard Review.

Non-Revenue Water

- 9 Over the past eleven years (2013 – 2023), Non-Revenue Water, calculated at the difference between the annual volume of water pumped from the wellfield and the sum of all the individual water meters, has averaged 15% (37,527 m³). This is within the expected range of 15% to 25% for the District's water system based on its size, age, distribution system pipe material, and system static pressures.

Number of Properties Served

- 10 The number of properties serviced by the Wellfield over the past five years (2019 – 2023) has increased by from 901 to 922; 21 properties (2%).
- 11 The 922 connections do not include any vacant lots approved by the District that have an existing water service. With recent development, this value is expected to increase as new houses are built and connected to the District's water system.
- 12 The 922 connections do not include any allowance to supply water to the Foothills development in the event that the Foothills well is offline or under-producing.

Per Connection Historical Demands

- 13 Over the past five years (2019 – 2023), the calculated per connection Average Day demand has ranged from a low of 745 to a high of 860 L/day per connection. This equates to 57% and 66% of the District's design standard of 1,300 L/day per connection for a Single Family, ½ acre parcel.
- 14 Over the past five years (2019 – 2023), the calculated per connection Maximum Day demand has ranged from a low of 1,430 to a high of 1,845 L/day per connection. This equates to 62% and 79% of to the District's design standard of 2,320 L/day per connection for a Single Family, ½ acre parcel.

Potential Number of New Properties Served: Maximum Day Demand Conditions

- 15 Based on the District's maximum day per connection design standard of 2,320 L/day per connection (for a ½ acre Single Family lot) and the authorized licenced maximum day withdrawal limit of 1,425 m³/day, the maximum number of properties that should be serviced is **615**, which is less than the 922 properties serviced in Year 2023.
- 16 *There is a wide range of the number of additional properties that could potentially be serviced by the Harby Road wellfield based on the Year 2017 Wellfield Capacity Rating and the historical maximum day demand over the past five years. The potential number of additional properties ranges from 418 to 728 (Table 7).*

Potential Number of New Properties Served: Average Day Demand Conditions

- 17 Based on the District's average day per connection design standard of 1,300 L/day per connection (for a ½ acre, Single Family lot) and the authorized licenced annual withdrawal limit of 260,000 m³/year, which equates to an average day withdrawal of 712.5 m³/day, the maximum number of properties that should be serviced is **550**, which is less than the 922 properties that are presently being serviced (Year 2023).

- 18 There is a wide range of the number of additional properties that could potentially be serviced by the Harby Road wellfield based on the Year 2017 Wellfield Capacity Rating and the historical average day demand over the past five years. The potential number of additional properties ranges from 468 to 678 (**Table 8**).

Potential Number of New Properties Served Equations

- 19 The following equation was used for estimating the potential number of new properties that could be serviced by the wellfield (**Table 7** and **Table 8**):

$$\text{Potential Number of New Properties Served}^* = PNPS - ANPS$$

Where:

$$PNPS = \text{Potential Number of Properties Served} = \frac{\text{Wellfield Pumping Rate}}{\text{Water Demand Per Connection}}$$

$$\begin{aligned} ANPS &= \text{Actual Number of Properties Served}^* \\ &= \text{Number of active connections} + \text{Number of vacant lots with approved connections} \end{aligned}$$

* Does not include any existing or future properties within the Foothills Development

8 RECOMMENDATIONS

based on the findings of this report we recommend that the District of Lantzville:

- 1 Retain the services of a hydrogeologist to review the Year 2017 Wellfield Capacity Rating calculations and assess what impact the lower groundwater levels experienced in 2020, 2021 and 2022, and the pumping conditions experienced during the summer of 2023 may have on the Capacity Rating Calculation.
- 2 Subject to the findings of item 1 above, apply to the provincial government for an adjustment to their water licence for both the maximum day and total annual demand limits.
- 3 Continue to monitor the volume of water delivered to the Foothills development from the Harwood Reservoir when the existing Foothill well is offline or under-performing.
- 4 Review the current number of water system connections to existing customers and confirm the number of existing vacant lots with approved connections to establish the overall number of committed connections before assessing whether any additional connections are approved by the District.
- 5 Reconsider the impacts of emergency supply to the Foothills development when assessing the number of future connections available within the system.
- 6 That the District continue to follow the eleven recommendations noted in our May 2016 Water Demand Design Standard Review, a copy of which is included in [Appendix E](#).

APPENDIX A

Aquifer No. 215 Factsheet



Aquifer Description (Mapping Report - 1996):

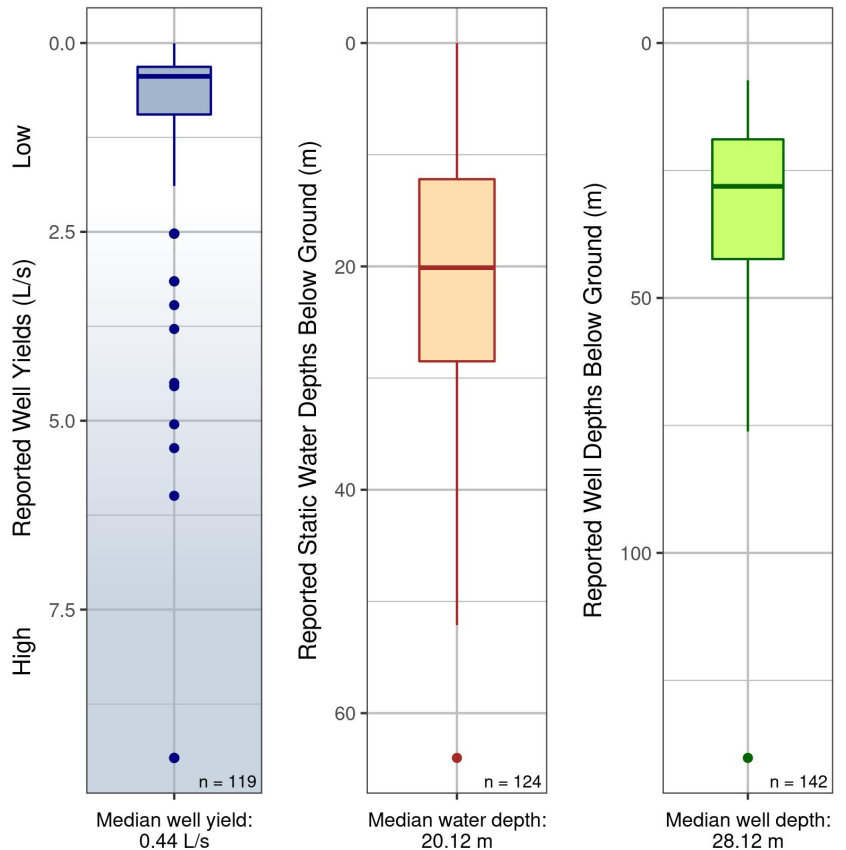
Confined Glacio-fluvial sand and gravel aquifers underneath till, in between till layers, or underlying glacio-lacustrine deposits (subtype = 4b).

Aquifer Details

Region	West Coast
Water District	Nanaimo
Aquifer Area	14.3 km ²
No. Wells Correlated	142
Vulnerability to Contamination	Low
Productivity	Moderate
Aquifer Classification	IIC
Hydraulic Conductivity *	3.5×10^{-5} - 2.2×10^{-3} m/s (n=8)
Transmissivity *	3.9×10^{-4} - 1.4×10^{-2} m ² /s (n=8)
Storativity *	1×10^{-4} - 9×10^{-4} (n=5)
No. Water Licences Issued to Wells	1
Observation Wells (Active, Inactive)	232, 340

* min - max

For Hydraulic Connection see [guidance document](#)



Disclaimer: Use of information from Aquifer factsheets (accessed by BC government website) is subject to limitation of liability provisions (further described on that website). That information is provided by the BC government as a public service on an "as is" basis, without warranty of any kind, whether express or implied, and its use is at your own risk. Under no circumstances will the BC government, or its staff, agents and contractors, be responsible or liable to any person or business entity, for any direct, indirect, special, incidental, consequential or any other loss or damages to any person or business entity based on this factsheet or any use of information from it.

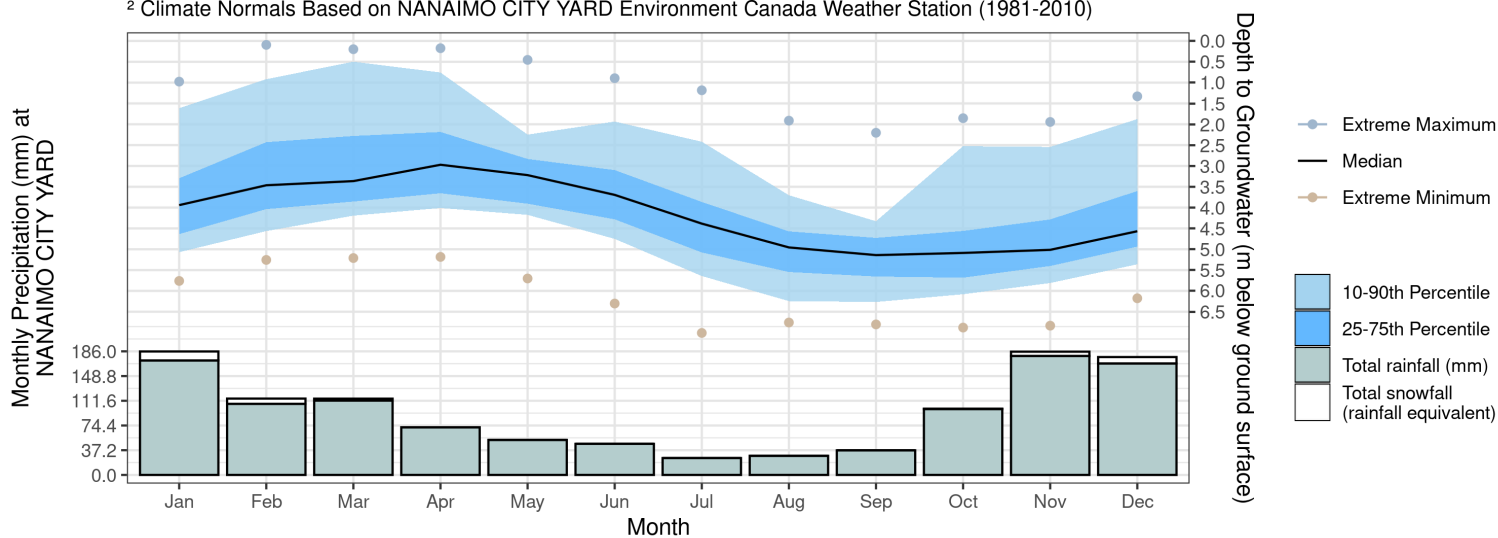
Detailed methods for all figures are described in the companion document ([Aquifer Factsheet - Companion Document.pdf](#)).

Factsheet generated: 2022-07-27. Aquifers online: <https://apps.nrs.gov.bc.ca/gwells/aquifers>.

Monthly Groundwater Level¹ with Precipitation from Climate Normals²

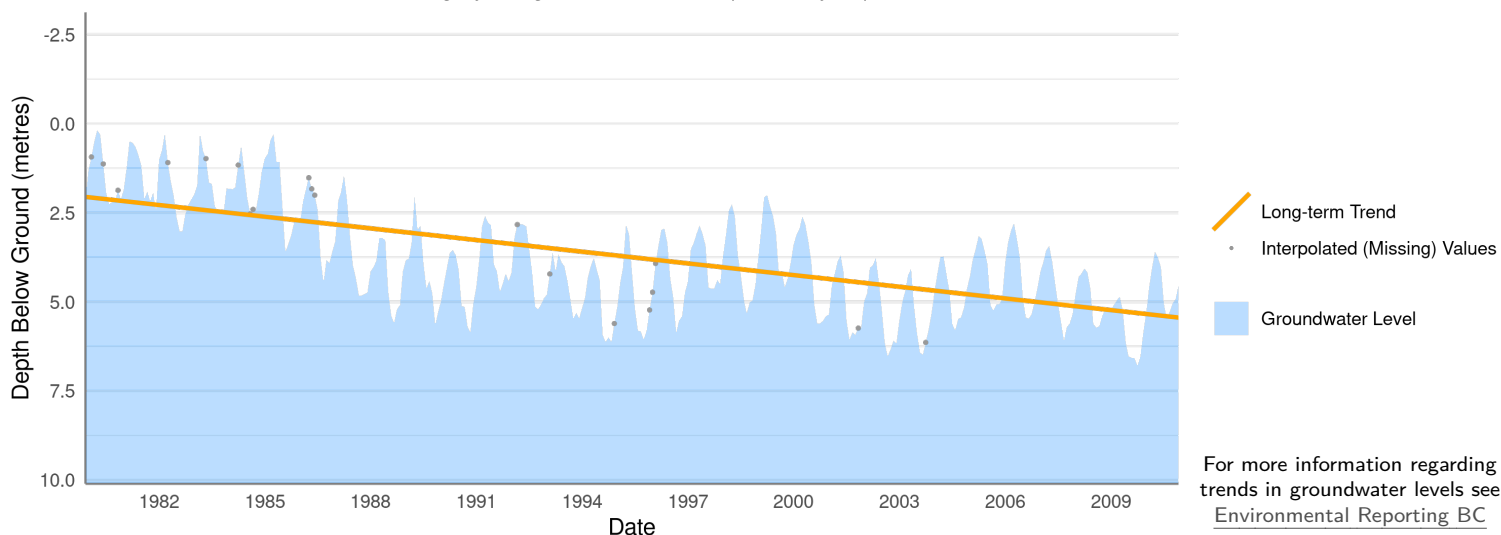
¹ Full Monthly Water Level Summary (43 years of data; 1979-2022)

² Climate Normals Based on NANAIMO CITY YARD Environment Canada Weather Station (1981-2010)

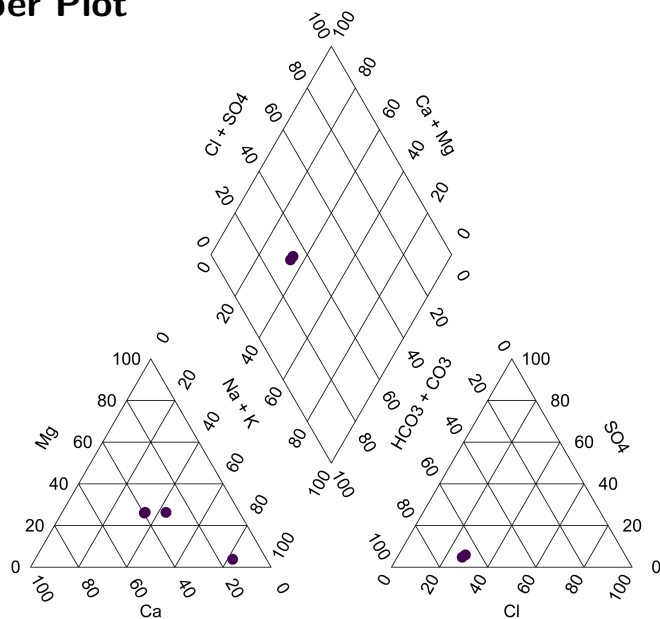


Groundwater Levels and Long-term Trend

Category: Large Rate of Decline (-0.11 m/year)



Piper Plot

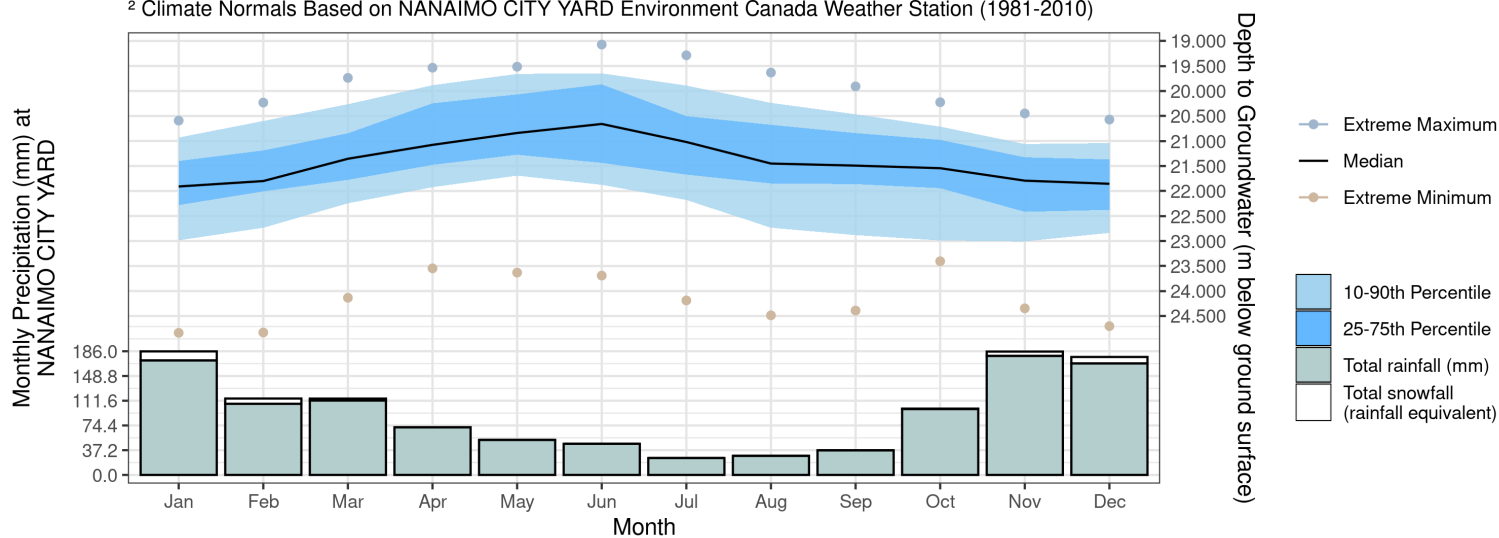


The groundwater samples are typically of the Ca-Na-Mg-HCO₃-Cl type. The fact that HCO₃ is the dominating anion shows the source is dominantly current precipitation in the sand and gravel aquifers#215. Na and Cl enrichment could be attributed to anthropogenic activities such application of chemical fertilizers, sewage effluents, and/or indiscriminate house hold solid wastes disposal in the area. For EMS water chemistry data, see EMS ID 1400239.

Monthly Groundwater Level¹ with Precipitation from Climate Normals²

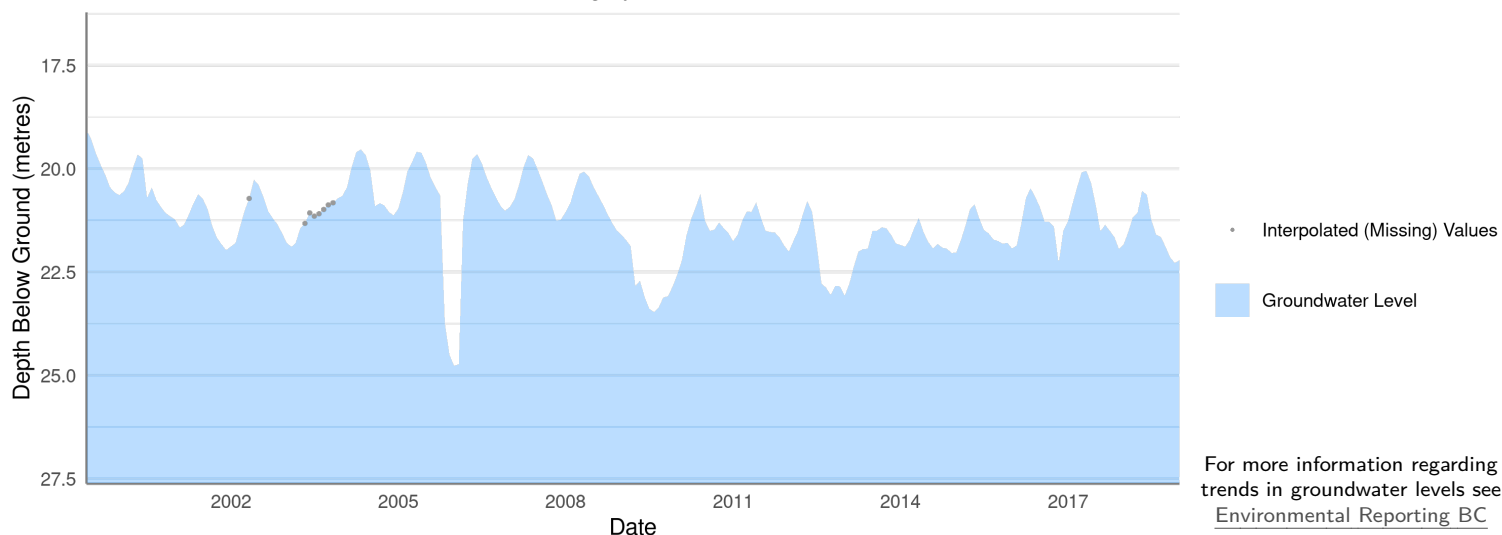
¹ Full Monthly Water Level Summary (23 years of data; 1999-2022)

² Climate Normals Based on NANAIMO CITY YARD Environment Canada Weather Station (1981-2010)



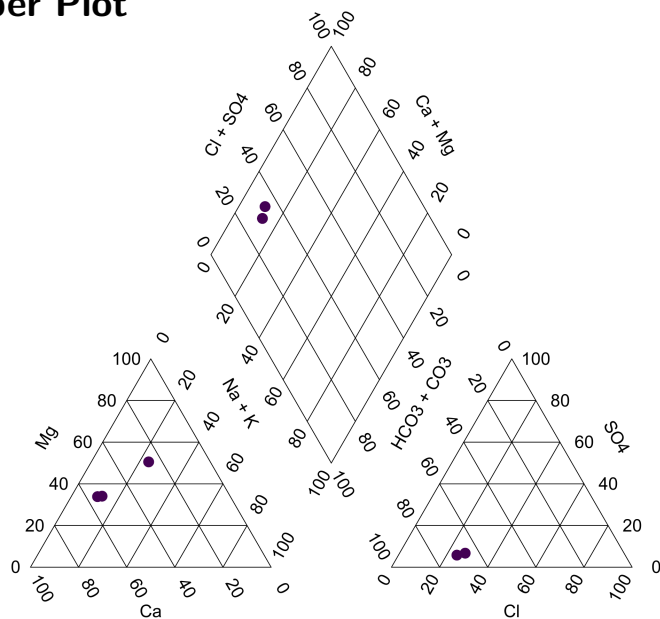
Groundwater Levels and Long-term Trend

Category: Stable



For more information regarding trends in groundwater levels see [Environmental Reporting BC](#)

Piper Plot



The groundwater samples are typically of the Ca-Mg-HCO₃-Cl. The fact that HCO₃ is the dominating anion shows the source is dominantly recent precipitation in the sand and gravel aquifer #215. Cl enrichment could be attributed to anthropogenic activities such application of chemical fertilizers, sewage effluents, and/or indiscriminate house hold solid wastes disposal in the area. [For EMS water chemistry data, see EMS ID E240082.](#)

Water Budget

Table 50: Summary of Water Budget and Stress Analysis – WR5 (SW-N)

Aquifer Tag No.	Aquifer Lithology	Potential Groundwater-Surface water or Aquifer to Aquifer Interaction	MOE Obs Well	Seas. Fluc.	Long Term Fluc.	WL Trend (up or down)	Total Est. AQ. Rec. (TRin) (Rp/l + Rmb)	Est. Ann. Disch to Cr. & Down Grad Aquifer (Tc out)	Ground Water Use Estimate (ANTHout)	Total Out [TcOut + ANTHout]	Stress Anal. % GW Use of the avail. AQ. Rec.	Relative Stress Assess.
			ID	(m)	(m)	U/D	(m ³ /yr)		(m ³ /yr)	(m ³ /yr)	(%)	Lo, Mod, Hi
219	Quadra	Nanoose Creek, Ocean	392, 393	?	?	L	1.6E+08	1.56E+07	2.8E+06	1.83E+07	11	Lo
214	NG	Ocean	NA	NA	NA	NA	6.2E+05	0.00E+00	4.4E+02	4.40E+02	0	Lo
210	Buttle Lake Group - Fourth Lake Formation & Mount Hall Gabbro	Nanoose Creek, downgrad Fault Contact & NG	NA	NA	NA	NA	3.1E+06	2.45E+06	3.2E+05	2.77E+06	89	Mod-Hi
218	Benson Fm, JP, VG	Ocean	394	?	?	?	2.0E+06	4.06E+06	2.7E+05	4.33E+06	212	V. High
213	VG	Coal Works and Ocean	NA	NA	NA	NA	1.4E+07	4.12E+05	7.2E+05	1.13E+06	8	Lo
215	Quadra	Ocean	340, 232	1.6, 3.0	5, 7	D/L	6.3E+07	6.05E+07	4.4E+05	6.09E+07	97	Mod-Hi
166	VG & NG	Radial Flow to Long Lk., Dep. Bay, Neck Pt. etc., Ocean	NA	NA	NA	NA	2.2E+06	0.00E+00	0.0E+00	0.00E+00	0	Lo
211	VG & NG	Underground Coal Works	388	10.0	?	precip	3.8E+06	9.18E+06	2.3E+06	1.15E+07	306	V. High
167	Capilano	Benson Fm	NA	NA	NA	NA	3.6E+07	1.77E+07	0.0E+00	1.77E+07	49	Lo-Mod

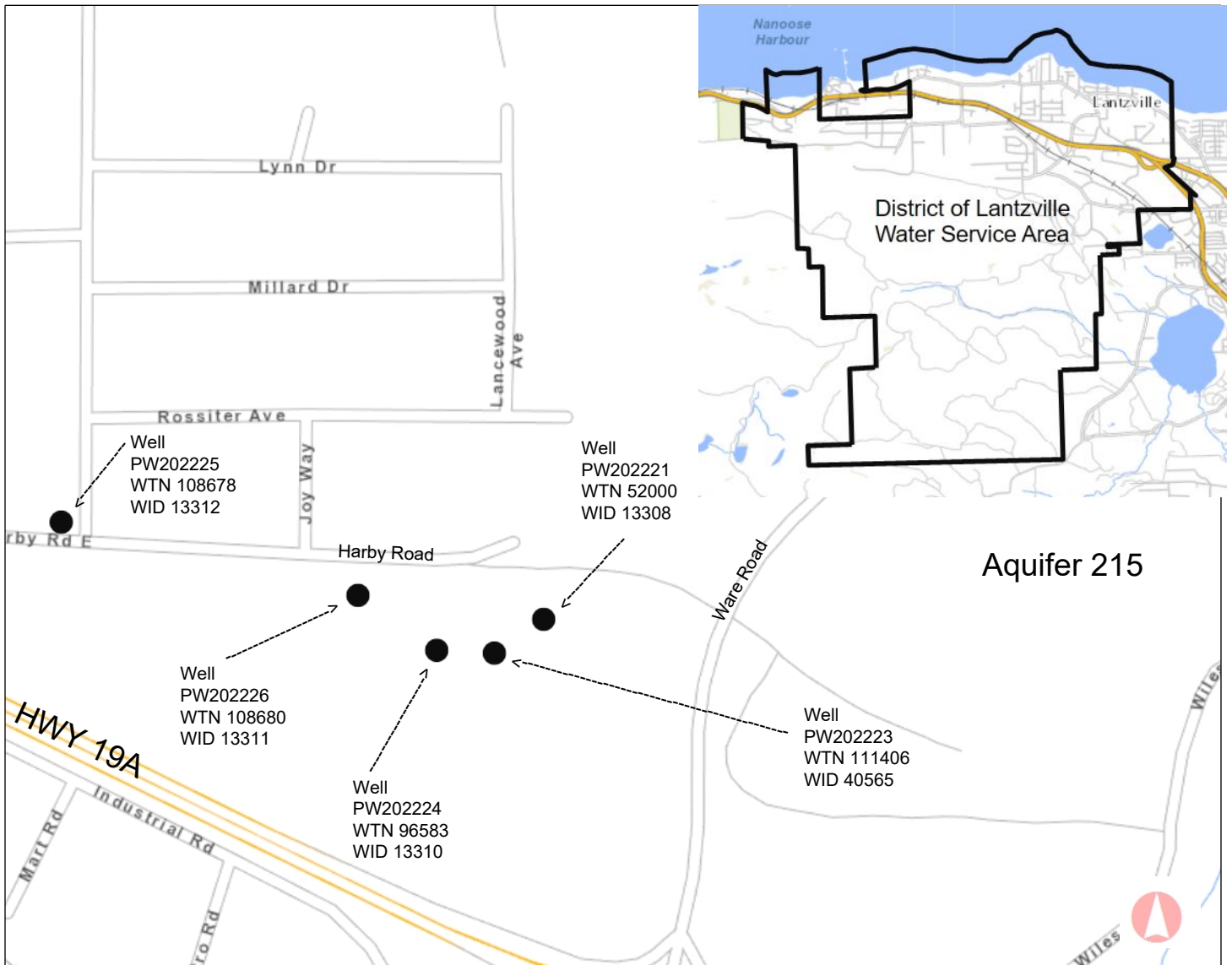
Notes: SW-N means South Wellington to Nanoose, NA means not applicable, AQ means aquifer, Seas. Fluc. means seasonal fluctuation, PDO means Pacific Decadal Oscillation, WL means water level, Est means estimated, Disch. means discharge, Rec. means recharge, Cr. Means creek, TRin means total recharge into aquifer, Rp/l means total recharge from precipitation and/or leakage from overlying aquifer, Rmb means total lateral recharge from up gradient aquifer or mountain block, Tc out means total aquifer groundwater discharge to creek, assess. means assessment, Total out means total discharge from aquifer (not including discharge to ocean), ANTH out mean total groundwater Anthropogenic groundwater extraction from aquifer, aquifer stress color codes: Blue=low, Green=low to moderate, Yellow=moderate, Brown=moderate to high, Red=high to very high.

The water budget estimate for the Quadra aquifer (215) in Lantzville indicates a moderate to high level of stress. Aquifer 215 has a relatively small catchment area (i.e. limited recharge potential) and little to no mountain block recharge. The well to well density is high in this area.

Reference: [WATER BUDGET PROJECT: RDN PHASE ONE \(VANCOUVER ISLAND\) 1924-11-001 Regional District of Nanaimo, British Columbia](#) (June 2013) Author: Waterline Resources Inc.

APPENDIX B

Harby Road Wellfield Water Licence No. 503273



WATER DISTRICT: Nanaimo
PRECINCT: Nanaimo
LAND DISTRICT: Nanoose/Wellington/Dunsmuir

Signature: 
Date: April 30, 2021

LEGEND:

Scale: 1: 5,000

Point of Diversion: 

Map Number: 092F030

Works not pictured: Distribution System

Conditional Water Licence 503273

File 20016351

The boundaries of the land to which this licence
is appurtenant are shown thus: 



Province of British Columbia

Water Sustainability Act

CONDITIONAL WATER LICENCE

The District of Lantzville is hereby authorized to divert and use water as follows:

- a) The **aquifer** on which the rights are granted **is 215.**
- b) The points of well diversion are located as shown on the attached plan.
- c) The date from which this licence shall have precedence is January 1, 1996.
- d) The purpose for which this licence is issued is waterworks (local provider).
- e) The maximum quantity of water which may be diverted is **260,000 cubic metres per year**, the **maximum daily** diversion **shall not exceed 1,425 cubic metres.**
- f) The period of the year during which the water may be used is the whole year.
- g) The land upon which the water is to be used and to which this licence is appurtenant is all the lands within the boundaries of the District of Lantzville Water Service Area.
- h) The authorized works are **(5) wells** and distribution system, which shall be located approximately as shown on the attached plan.
- i) The construction of the said works has been completed and the water is being beneficially used. The licensee shall continue to make regular beneficial use of the water in a manner authorized herein.
- j) The licensee shall measure and record the volume of water diverted under this licence, to the satisfaction of an Engineer or Water Manager under the *Water Sustainability Act*.
- k) The licensee shall retain records of the water volume diverted under this licence for inspection upon request by an Engineer or Water Manager under the *Water Sustainability Act*.

Cali Melnechenko
Water Manager

APPENDIX C

**Simultaneous Pumping and Capacity Assessment at the Harby Road Wellfield, Lantzville, B.C.
September 17, 2027 letter report (3 pages)
Lowen Hydrogeology Consulting Ltd.**

September 21, 2017
LHC Project File: 1706

District of Lantzville
P.O. Box 100, 7192 Lantzville Rd
Lantzville, B.C.
V0R 2H0

Attention: Mr. Fred Spears

Re: Simultaneous pumping and capacity assessment at the Harby Road Well Field, Lantzville, B.C.

1.0 INTRODUCTION

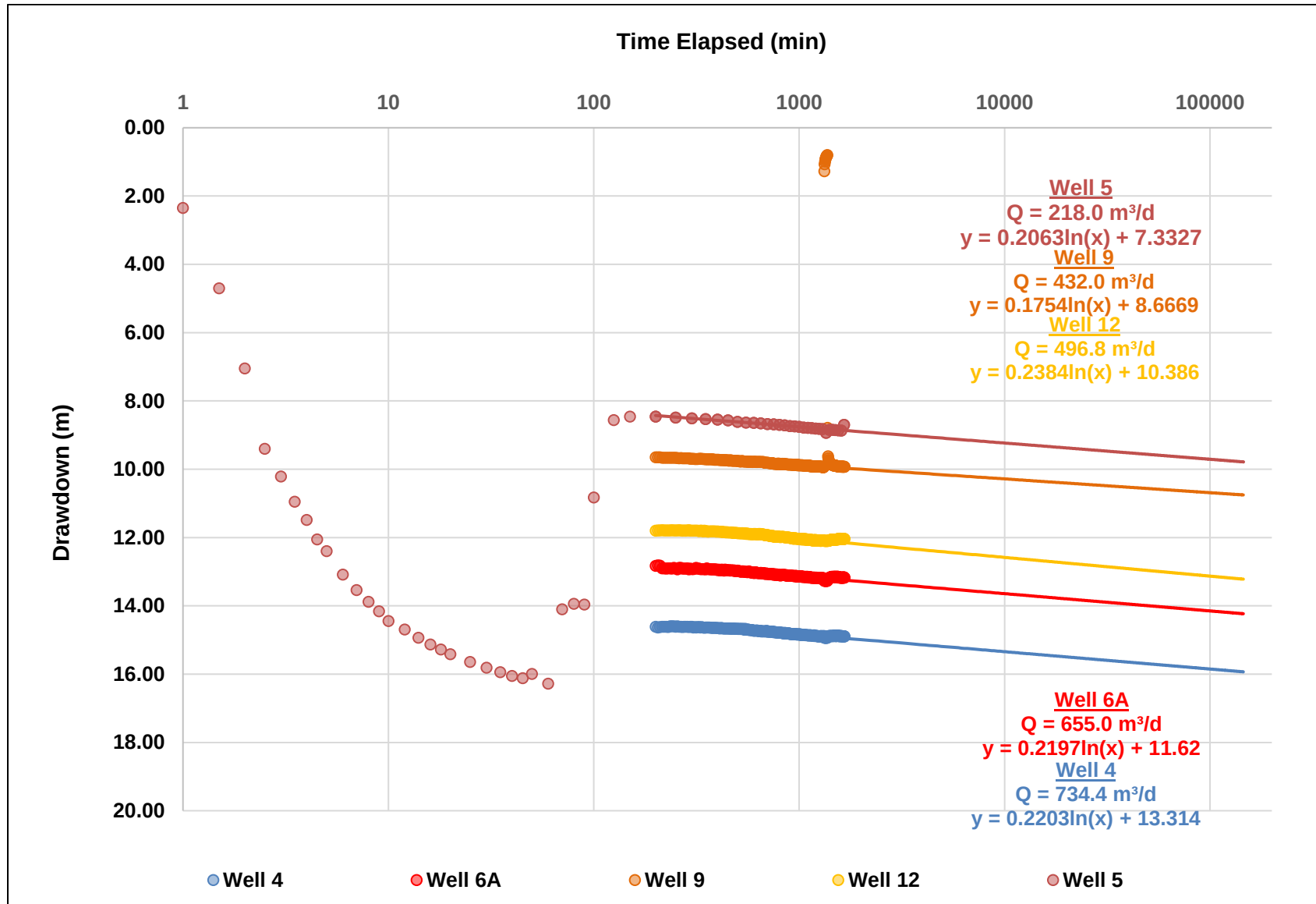
An assessment of the Harby Road Well Field was carried out in March 2015. Following from that work several recommendations were made including re-development work on Wells #4, #9 and #12, plus re-drilling of Well #6. This work has been carried out and the new well (located beside well #6) is referred to as Well #6A. In March 2017, the well field capacity was updated to include Well #5. At that time it was recommended to test the entire well field at the end of the dry season to determine the seasonal low yield capacity.

The current well field encompasses 5 pumping wells: well #4, well #5, well #6A, well #9 and well #12. A simultaneous pumping was carried out in August 2017 to assess the ultimate field capacity when all wells are pumping together. This accounts for mutual interferences that were noted previously during single well pumping tests.

2.0 WELL TESTING

The pump test started on August 28, 2017 at 11:00 AM and ended on August 29, 2017 at 3:00 PM. The drawdowns at wells #4, #6A and #12 dropped too low at the beginning of the test. Flow adjustments were made to keep the water levels safely above the pumps. The useable data starts therefore 200 min after the initial pumping. The pumping rate at well #5 was also lowered at this time due to a quick drop of the water level (see Graph 1).

Graph 1 - Drawdown vs. time at the Harby Road Well Field



3.0 CALCULATION OF THE WELLFIELD CAPACITY

Based on the previous graph, the combined well field capacity is as follows:

	Well #4	Well #5	Well #6A	Well #9	Well #12
Pumping rate (m³/d)	734	218	655	432	497
100-d drawdown (m)	15.9	9.8	14.2	10.8	13.2
100-d specific capacity (m³/d/m)	46.1	22.3	46.0	40.2	37.6
Total available drawdown (m)	16.7	22.4	21.0	15.4	14.6
Safe available drawdown (m)	11.7	15.7	14.7	10.8	10.2
Well capacity (m³/d)	538.9	348.8	675.4	434.0	383.1
Well capacity (USgpm)	99	64	124	80	70
Total wellfield capacity (m³/d) (USgpm)	2380 437				

3.0 CLOSING

Long-term combined well capacities have been estimated for the existing wells #4, #5, #6A, #9 and #12. The BC Ministry of Environment (1999) standard well rating formula has been used which includes a 30% safety factor. This test was performed in the dry season and represents the result under minimum aquifer water levels. The total of 2380 m³/d can be considered as the minimum the field can produce with these 5 wells, the capacity increasing with wetter season conditions. Individual well capacities previously determined are higher for wells 4, 5, 6A and #12 than shown above. Therefore, when only one well is pumping, or one of the above and well #9, the pumping rates can be significantly higher. The well rating formula also considers water levels after 100 days of steady pumping. Therefore, the combined pumping rate could be higher for shorter time periods.

If you have any questions or require any further information, please contact the undersigned.

Best regards,

LOWEN HYDROGEOLOGY CONSULTING LTD.

Dennis Lowen

Dennis A. Lowen, P. Eng. P. Geo.
DL / MD / hr



APPENDIX D

Bylaw No. 226, Schedule "B" Design Standards, Residential Water Design

**DISTRICT OF LANTZVILLE
BYLAW NO. 226**

**A BYLAW TO AMEND DISTRICT OF LANTZVILLE
WATER SYSTEM BYLAW NO. 140, 2018**

The Council of the District of Lantzville in open meeting assembled, enacts as follows:

1. District of Lantzville Water System Bylaw No. 140, 2018, is hereby amended as follows:

By replacing Schedule B, table 1 and table 2 Design Standards with, Schedule B Design Standards, 2020 as attached to and forming Schedule B of this Bylaw.
2. This Bylaw may be cited for all purposes as “District of Lantzville Water System Bylaw No. 140, 2018, Amendment (Water Standard) Bylaw No. 226, 2020”.

READ A FIRST TIME this 27th day of January, 2020.

READ A SECOND TIME this 27th day of January, 2020.

READ A THIRD TIME this 27th day of January, 2020.

ADOPTED this 10th day of February, 2020.

ORIGINAL SIGNED

Mayor

ORIGINAL SIGNED

Corporate Officer

District of Lantzville

**Water System Bylaw No. 140, 2018, Amendment (Water Standard) Bylaw No. 226, 2020
Schedule 'B'**

Water System Bylaw No.140, 2018

**SCHEDULE "B"
DESIGN STANDARDS
Residential Water Design
2020**

Residential Land Use	Pop Density (capita per unit)	Average Day (rounded) (l/cap)	Maximum Day (rounded) l/cap)	Average Day (rounded) l/con	Maximum Day (rounded) l/con
Single Family Dwelling					
1/4 acre	2.4	510	933	1,250	2,240
1/3 acre	2.4	515	950	1,250	2,280
1/2 acre	2.4	530	967	1,300	2,320
1 acre	2.4	555	1,000	1,350	2,400
Multi-Family					
1 storey / prefab	1.9	400	900	760	1,710
2 storey	1.9	400	900	760	1,710
Townhouse					
3 – 4 storey	1.9	400	900	760	1,710
Apartment / Strata Unit	<i>To be determined by Professional Engineers at time of application</i>				
3 – 4 storey (assisted living)	1.2	400	900	760	1,425
Seniors Living	<i>To be determined by Professional Engineers at time of application</i>				

0.10 ha
0.135 ha
0.20 ha
0.40 ha

APPENDIX E

**District of Lantzville
Water Demand Design Standard Review, May 13, 2016
Recommendations (2 pages)
Koers & Associates Engineering Ltd.**

5 RECOMMENDATIONS

Based on the findings in the report, it is recommended that the District of Lantzville:

- 1 Continue to implement improvements to the District's wellfield and utilize the aquifer as recommended in the July 2015 report before undertaking any revisions to the District's design demand standards.
- 2 Increase reservoir storage within the District as recommended in the July 2015 report before undertaking any revisions to the District's design demand standards.
- 3 Secure and integrate an additional water supply source prior to adjusting the design standards.
- 4 Consider establishing the following water demand design standards for new development serviced by the District's municipal water system as noted in Table 7, specifically:

Average Day Demand: 510 litres per capita per day, or 1,225 litres per connection per day

Maximum Day Demand: 1,220 litres per capita per day, or 2,900 litres per connection per day

Peak Hour Demand: 2,000 litres per capita per day, or 4,800 litres per connection per day

- 5 Proceed with any changes to the design standards on an incremental basis, and only after improvements to the storage and supply system are made.
- 6 Continue to monitor system demand patterns and assess system performance on a yearly basis.
- 7 Continue to implement water conservation measures as they have shown to be effective in managing system demands.
- 8 Review system performance on a regular basis and be prepared to make adjustments as conditions warrant.
- 9 Assess water demands for non-residential development (ICI) at the time of development and base design conditions on the proposed business/land-use activity and general good engineering best practises.
- 10 Keep abreast of ongoing climate change research and its potential impact on aquifer recharge rates, especially when making infrastructure policy decisions.

- 11 Maintain Bylaw No. 55. for properties that are outside the water service boundary noted in the OCP, and are not connected to the District's municipal water system, i.e., each new lot is provided with 3,400 L/day (0.5 igpm) of drinking water from a well (see Schedule C – Standards for Water Distribution Systems, Scope, Item 2).



District of Lantzville

Policy No. 3007-4

Date of Implementation: January 13, 2020

Council Resolution: C20-2

WATER CONNECTION PRIORITIES POLICY

PURPOSE

To establish priorities for the allocation of water connections.

BACKGROUND

The Lantzville/Nanaimo Water Agreement came into effect on June 18, 2018 with the completion of the interconnection of the Nanaimo and Lantzville water systems. With the Nanaimo water buy-in of \$1,330,258.50 paid by the Municipality (representing 225 households in Upper Lantzville already connected to Lantzville's water system), 286 new water connections became available. These 286 water connections may be used to supply water to existing or proposed development in the lower pressure zone.

The Agreement also provides 50 connections per year to be used for existing or proposed development in the upper pressure zone which, if unused in a given year, accumulates for use in subsequent years.

POLICY

When requests for water connections are received by the Municipality, the Director of Public Works will consider the following priorities for those connections:

- Priority 1: Existing parcels with a house that have insufficient supply for domestic use;
- Priority 2: Existing parcels with a house where due to water quality issues the existing supply is unsafe for domestic use.
- Priority 3: Existing parcels where a house cannot be built due to a lack of suitable domestic water supply.
- Priority 4: Development in the Village Primary Commercial Core.
- Priority 5: Infill subdivisions of property fronting an existing waterline.
- Priority 6: Subdivisions immediately adjacent to the end of an existing waterline.

**DISTRICT OF LANTZVILLE
BYLAW NO. 175, 2020**

**A BYLAW TO REGULATE AND REQUIRE THE PROVISION OF
WORKS AND SERVICES IN CONNECTION WITH
THE SUBDIVISION AND DEVELOPMENT OF LAND**

AND WHEREAS section 506 of the *Local Government Act* authorizes the District of Lantzville to enact a bylaw to establish subdivision and development servicing requirements;

NOW THEREFORE the Municipal Council of the District of Lantzville in open meeting assembled enacts as follows:

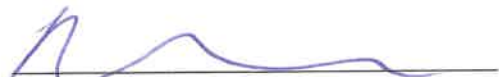
1. This bylaw may be cited for all purposes as the “District of Lantzville Subdivision and Development Works and Services Bylaw No. 175, 2020”.
2. The District of Lantzville Subdivision and Development Works and Services Bylaw is set out in Schedule ‘A’ attached to and forming part of this Bylaw.
3. Land must not be subdivided or developed, except in accordance with this bylaw.
4. If a portion of this bylaw is held invalid by a Court of competent jurisdiction, then the invalid portion must be severed and the remainder of this bylaw is deemed to have been adopted without the severed section, subsection, paragraph, subparagraph, clause or phrase.
5. District of Lantzville Subdivision and Development Bylaw No. 55, 2005 and its amendments are hereby repealed.

READ A FIRST TIME this 13th day of January, 2020.

READ A SECOND TIME this 13th day of January, 2020.

READ A THIRD TIME this 27th day of January, 2020.

ADOPTED this 10th day of February, 2020.


Mark Swain, Mayor


Trudy Coates, Director of Corporate Administration

4 STANDARDS FOR WATER DISTRIBUTION SYSTEMS

General

- 4.1 All new parcels shall be provided with a connection to the Municipal water system when such connections are available and approved by the Municipality, and to the satisfaction of the Director of Public Works.
- 4.2 If a connection to the Municipal water system is unavailable, the Municipal Official may require the owner to provide a certification from a Professional Engineer that each new parcel has the capacity to supply at least 3400 L of drinking water per day from a well on the parcel that meets the *Drinking Water Protection Act* and the Guidelines for Canadian Drinking Water Quality. Each newly created parcel must be serviced only and solely by a well located within the boundaries of that parcel. Each well on each newly created parcel must meet the Municipality's water provision standards.
- 4.3 For any proposed subdivision where water servicing is intended to be provided from an onsite well, the owner/developer must provide to the Municipality a report from a Professional Hydrologist that certifies that the withdrawal of the minimum quantity of water specified in Section 4.2 from each of the proposed wells would have no negative impact on existing wells within a 150 m radius of the well.
- 4.4 Developers of parcels of land greater than 2 ha. shall be responsible for locating and developing a separate source of water, unless the Director of Public Works and the Approving Officer determine that it is not in the best interest of the Municipality.

Design

- 4.5 Watermains and appurtenances shall be designed in accordance with the locations and sizes required by Part 2 of this bylaw and shown on a plan approved by the Municipal Official. The locations of the watermains shall be within a road unless otherwise approved by the Municipal Official.

Construction

- 4.6 Watermains and appurtenances shall be laid in accordance with the specifications in Part 2.

District of Lantzville

REPORT TO CHIEF ADMINISTRATIVE OFFICER

Meeting Date: May 14, 2025

SUBJECT: UBCM Next Generation 911 – Grant Application 2025

PURPOSE

To seek council approval to allow the Regional District of Nanaimo to apply for, manage, administer and be the recipient for all the grant funds on behalf of the District of Lantzville for the 2025 grant application to the Union of British Columbia Municipalities for the Next Generation 911 funding stream.

RECOMMENDATION

1. THAT Council approves the Regional District of Nanaimo to apply for, manage, administer and be the recipient for all the grant funds on behalf of the District of Lantzville for the 2025 grant application to the Union of British Columbia Municipalities for the Next Generation 911 funding stream.

COMMITTEE/COMMISSION RECOMMENDATION

N/A

ALTERNATIVES AND IMPLICATIONS

That Council not approve to participate in the joint application and the District of Lantzville submits an application on its own.

BACKGROUND/RELEVANT HISTORY

In December 2024, the Union of British Columbia Municipalities (UBCM) and the Province of British Columbia (BC) reviewed the program design for the 2025 Next Generation 911 program and agreed to amend aspects of the program. In March 2025, there was an additional amendment to the grant application's eligible activities to include "Purchase and installation of Mobile Computer Aided Dispatch (CAD) agents (i.e. mobile data terminals (MDTs)) in fire department vehicle(s) owned by the eligible applicant".

CADs are used to assist our fire apparatus responding to emergency scenes in a timely and efficient manner.

The CAD System allows the crews to see real-time updates from dispatch, mapping of addresses and fire hydrants are also displayed. The system also displays the fastest route to the emergency.

ATTACHMENT

1. Staff report from the Regional District of Nanaimo.

ANALYSIS/RATIONALE

Working with the Regional District of Nanaimo to apply for this grant allows us to share the workload and work collaboratively.

By applying for this grant, there would be no cost for the purchase of the new CADs, mounting equipment, installation or licensing,

1. Strategic Plan Objectives

N/A

2. Resources

N/A

3. Financial/Budget Implications

Each CAD requires a subscription fee of \$600 per year. This would be accounted for in the 2026 budget as an additional cost of \$2,400.

The CADs also require a cellular connection that we currently pay \$ 5.00 per unit per month.

4. Sustainability Implications

The CADs are recommended to be replaced every 5 years. Future purchases would come from the Vehicle & Equipment Reserve.

Prepared by:



Neil Rukus,
Fire Chief

Approved for submission to Council:



Sundance Topham
Interim Chief Administrative Officer

Date: April 28, 2025

Date: April 28, 2025

REVIEWED WITH:			
☐ Corporate Administration	☐ Fire Rescue	☐ Public Works/Engineering	☐ RCMP
☐ Financial Services	☐ Planning	☐ Solicitor	☐ Committee:
☐ Other:			

COUNCIL AGENDA INFORMATION:		
Meeting Type	Date	Agenda Item #
Regular		
Closed (In-Camera)		

UBCM Next Generation 911 – Grant Application 2025

RECOMMENDATIONS

1. That the 2025 grant application to the Union of British Columbia Municipalities, Next Generation 911 funding stream for \$163,326.56 be endorsed by the Regional District of Nanaimo Board.
2. That the Regional District of Nanaimo apply for, manage, administer and be recipient for all grant funds on behalf of the District of Lantzville for the 2025 grant application to the Union of British Columbia Municipalities, for the Next Generation 911 funding stream.
3. That the 2025-2028 Financial Plan be amended accordingly.

BACKGROUND

In December 2024, the Union of British Columbia Municipalities (UBCM) and the Province of British Columbia (BC) have reviewed the program design for the 2025 Next Generation 911 program and have agreed to amend some aspects of the program. In March 2025, there was an additional amendment to the grant application's eligible activities "Purchase and installation of Mobile Computer Aided Dispatch (CAD) agents (i.e. mobile data terminals (MDTs)) in fire department vehicle(s) owned by the eligible applicant".

These CADs are used by emergency services, and specifically fire departments to enhance their response to emergencies. In simple terms these are rugged tablet computers with specific software that integrates with the fire dispatch centers. These CADs provide responders with Realtime critical incident information from fire dispatch centers and BC Ambulance Dispatch. This information can include information updates not limited to updated property access details and site safety concerns. Another benefit of these CADs is for updated and detailed mapping for both their service areas and those of their mutual aid partners areas, this can improve response times. The grant provides for 100% funding, up to the applicant maximum, of the following eligible activities, the CAD's themselves, the docking stations, the installation of the CADs and docks in fire apparatus, mobile cellular boosters and the initial CAD software licensing fee.

Upon the update to the eligible grant activities to include the purchase of CADs that was changed in March 2025, the RDN reached out to the Town of Qualicum Beach, the City of Parksville and the District of Lantzville to determine if there was interest in a regional/ joint application. Only the District of Lantzville shared their interest in participating in a joint application.

There are a few restrictions in the funding stream, one is the CAD's must be owned by the applicant, for the RDN this extends to those departments owned or operated by the RDN and fire departments operated by societies and improvement districts on behalf of the RDN which are funded by the RDN. For the District of Lantzville this

only includes Lantzville Fire Rescue. The following fire departments are determined to be eligible for funding based on the UBCM's grant funding restrictions.

- Lantzville Fire Rescue
- The Bow Horn Bay Volunteer Fire Department
- The Coombs-Hilliers Volunteer Fire Department
- The Dashwood Volunteer Fire Department
- The Errington Volunteer Fire Department
- The Extension Volunteer Fire Department
- The Nanoose Fire Department
- The Cranberry Volunteer Fire Department (only the RDN funded and owned portions of the service)

The total grant application is for the RDN's entire eligible amount of \$100,000 and approximately \$60,000 of the District of Lantzville's to be spent on up to fifteen (15) fire department CAD devices. Each eligible fire department has indicated their keen interest in this funding stream and need for additional CAD devices. Because of the limited funding, each department were originally assigned a minimum of two (2) CAD for the purpose of this grant. There have been departments that subsequently shared they do not require additional CADs or that they only need one (1) CAD at this time. The grant application has been developed to appropriately accommodate the input of the fire chiefs in the eligible service areas and the needs of each department as they align with the eligible finding activities in the funding stream.

FINANCIAL IMPLICATIONS

The costs associated to the purchase of the devices, the mounting and installation of each CAD for each fire department is 100% covered in the grant funding.

The funding does not cover the following operational increases.

- There is a monthly fee of approximately \$10, for cellular services required for internet connectivity to each device installed in each fire department vehicle.
- There is an annual software license fee for each CAD which is approximately \$550 USD per device per year.

In communication with the fire departments, the respective fire chiefs have confirmed their operational budgets can accommodate the two operational increases this year.

The funding does not cover the eventual replacement of the devices in approximately five (5) years of anticipated lifespan for each device. This is not included in the current financial plan for most of the service areas.

There will be increases in subsequent budget years in each respective service area for the annual software licensing of approximately \$550 USD annually and approximately \$120 for the cellular services for each responsive CAD in each respective area.

It would be expected to see increases in future capital planning to replace these devices when they are at the end of their useful life in approximately five (5) years, the replacement of these devices would be anticipated no sooner than 2030.

STRATEGIC PLAN ALIGNMENT

Fire protection is a service that is supported by staff work and expected by the communities currently receiving it, under the understanding that it will continue as an important part of RDN service as broadly described in the “Our Role” section of the 2023-2026 Strategic Plan. Beyond that, the Strategic Plan does not explicitly identity fire protection as a Strategic Focus Area.

REVIEWED BY:

- S. Windsor, Manager, Fire and Rescue Services
- L. Grant, General Manager, Development and Emergency Services
- D. Holmes, Chief Administrative Officer

District of Lantzville

REPORT TO CHIEF ADMINISTRATIVE OFFICER

Meeting Date: May 14, 2025

SUBJECT: North Road Capital Budget

PURPOSE

The purpose of this report is to bring forward a capital budget amendment for North Road.

RECOMMENDATION

THAT the District of Lantzville's 2025 capital budget and related 2025 – 2029 Financial Plan be amended to include the North Road work at a cost of \$100,000 with funding coming from the Transportation Infrastructure Reserve.

ALTERNATIVES AND IMPLICATIONS

That the North Road work be deferred pending a review of the scope of the project and the related budget requirements.

BACKGROUND/RELEVANT HISTORY

At the January 15, 2025 budget meeting discussion occurred around the condition of North Road. Upon reviewing the motions from the meeting, the following was noted:

“THAT the north road project be added to the 2025 capital plan for \$100,000 for initial phase with funding coming from the Transportation Infrastructure Reserve Fund.”

After the discussion it was the understanding of the Interim Director of Financial Services that more information would be coming forward on North Road before inclusion in the 2025 capital; however, the above motion was approved.

In consultation with the Director of Public Works it has been determined that the above work is needed and as such a budget amendment is required, as the North Road assessments are required by a geo-technical expert and a professional engineer to determine the true extent and costing of the urgent repairs.

Financial/Budget Implications

As at the end of 2024 there was \$2.6 million in the Transportation Infrastructure Reserve Fund.

Prepared by:



Ken Bjorgaard
Interim Director of Financial Services

Date: April 29, 2025

Approved for submission to Council:



Sundance Topham
Interim Chief Administrative Officer

Date: April 29, 2025

REVIEWED WITH:			
☒ Corporate Administration	☐ Fire Rescue	☐ Public Works/Engineering	☐ RCMP
☒ Financial Services	☐ Planning	☐ Solicitor	☐ Committee:
☐ Other:			

COUNCIL AGENDA INFORMATION:		
Meeting Type	Date	Agenda Item #
Regular	May 14, 2025	
Closed (In-Camera)		
Special		