2021 Annual Water Summary Report

Prepared by: March 31, 2022

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Stephen Kari Date

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Mike Jensen Date

Director, Water/Wastewater Treatment & Compliance

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Introduction

The production and delivery of potable water in Ontario is regulated by Ontario Regulation (O. Reg.) 170/03 governed by the Ministry of the Environment, Conservation and Parks (MECP) under the *Safe Drinking Water Act* (SDWA), 2002, S.O. 2002, c. 32.

The purpose of this summary report is to provide system owners and municipal council information to satisfy the regulatory reporting required under Schedule 22 titled *Summary Reports for Municipalities* of the O. Reg. 170/03 Drinking Water Systems.

The information within the report must cover the following topics of the previous calendar year from January 1st through to December 31st.

A list of orders that were not met, the duration and any corrective actions needed;

A brief description of the operations of the treatment systems;

Quantities and flow rates of the water supplied during the reporting period, including monthly averages and maximum daily flows; and,

A comparison of the quantities and flows to the rated capacities approved in the system performance section in the Municipal Drinking Water Licence (MDWL).

An Annual Water Quality Report, to fulfill Section 11 of Ontario Regulation 170/03, has been completed separately and details the drinking water quality of all the CGS owned and operated drinking water systems. This annual report is available for viewing on the City of Greater Sudbury's website (https://www.greatersudbury.ca/live/water-and-wastewater-services/projects-plans-reports-and-presentations/drinking-water-quality-reports/) and notices were posted in local papers to inform the public and ensure access to a computer is available at any of the CGS Citizen Service Centers for residents to view.

SUMMARY

In the 2021 calendar year, the City of Greater Sudbury (CGS) operated its Drinking Water Systems without exceeding any of the limits within the Municipal Drinking Water Licences. Surface water plants supplying the Sudbury Drinking Water System (DWS) operated at less than half of permitted levels with the Wanapitei Water Treatment Plant (WTP) averaging 43% and the David Street WTP utilizing 40% of their respective total water takings listed in the Permits to Take Water (PTTW). Ground water systems also operated below permitted levels: Blezard Valley-Capreol DWS at 34% (Valley) and 21% (Capreol), Falconbridge DWS at 23%, Garson DWS at 15%, Onaping/Levack DWS at 38%, and Dowling DWS with the lowest usage at 5% of its PTTW. We currently have an adequate source water budget.

Due to the critical importance of safe, reliable drinking water and the continuing improvements made to source water protection legislation, CGS continues to invest in our water works systems to perform critical upgrades and infrastructure renewal. It should not be assumed that these upgrades are the result of any detected incidents of poor water quality, as in most cases they are completed to reduce the risk of potable water contamination as deemed necessary through mandatory compliance known as the Statutory Standard of Care. The regulation stipulates that water works owners will continually monitor water works performance, source water quality, review levels of treatment versus current standards and emerging technologies. For example, this standard of care has been demonstrated through the following projects:

1. Removal of Iron and Manganese within the Blezard Valley-Capreol system

   Though iron and manganese do not pose a direct health risk, at high concentrations in water they can cause aesthetic issues such as stains and coloured water. They also cause operational issues when UV disinfection systems become maintenance intensive. To reduce these impacts, CGS, working with its partners, is taking proactive actions by implementing treatment through a pilot project. The design and procurement of this project are now complete, and the construction is starting in Spring 2022.
2. Addressing contaminant levels in the Garson Well Field

   Tetrachloroethylene, a harmful chemical, was first detected in 2011 at levels below half the provincial regulated limit within two of the source waters within the Garson well field. Despite the levels being lower than permissible amounts, the City undertook a Municipal Class Environmental Assessment to identify a long-term water servicing strategy for the area. The preferred solution is to decommission the existing ground water supply wells and supply the Garson DWS with surface water from the Sudbury DWS. Detailed design is planned to start in 2022 and includes new

watermains, upgrades to the Maley Booster Station and a new Booster Station to replace the current O'Neil pressure valve. A water quality study was undertaken, and a corrosion expert was consulted, on the phased construction plan to gradually introduce surface water and decrease the ground water in the Garson DWS.

The MECP is responsible for the enforcement of regulations and conducts annual, announced and unannounced inspections of all our facilities. As part of the new format used by the MECP, the Inspection Rating Record (IRR) is not included in the final consolidated report. All CGS water systems reviewed to date passed the inspection. However, two issues were identified: ongoing tetrachloroethylene contamination impacting Garson Wells #1 and #3; and elevated levels of trihalomethanes (THMs) and halo acetic acids (HAAs) in parts of the Vermilion distribution system. Work is already underway to decommission the Garson wells and introduce water from the Sudbury DWS. And a working group is being formed with participants from Vale and CGS to address the THMs/HAAs in the Vermilion system. We are still waiting for the final reports pertaining to the Wanapitei WTP and David St. WTP of the Sudbury DWS.

As per regulatory requirement, 14 adverse water quality incident (AWQI) reports have been filed. Corrective actions were taken, and issues were promptly rectified and reported to the MECP as well as the Public Health Sudbury & Districts (PHSD) unit.

For 2020/2021, the MECP inspected our Dinking Water Systems and noted two non-compliances with regulatory requirements. Both non-compliances were the same and applied to Wanapitei and David Street:

> The owner did not have a harmful algal bloom (HAB) monitoring plan that met the requirements of the Municipal Drinking Water Licence (MDWL) condition. Requirements for the HAB plan are outlined beginning on page 17 of the MDWL. The HAB plan was recently updated, is available electronically to operators, and covers the basics of maintaining CT (concentration × time, measures the effectiveness of a disinfection process) at particular levels when required. Intake Protection Zone (IPZ) mapping for source water is also provided. The intake camera is used for viewing of the intake area. However new requirements in the MDWL were not met with the existing HAB plan, including:
>
> - No directions to report blooms to SAC, ORO, MOH (Spills Action Centre, Overall Responsible Operator, Ministry of Health)
> - No sampling plan details including location, type, frequency
> - Triggers for increased sampling need to be expanded as per Condition 6, MDWL
> - Staff training must be documented in accordance with the MDWL.

The respective HAB plans for Wanapitei and David St. were updated and provided to the MECP on June 17, 2021, and the operator training was completed and documented on July 26, 2021.

The Community Lead Testing Initiative was instilled in 2007 and falls under O. Reg. 170/03, Schedule 15.1. Due to COVID-19 restrictions, CGS was granted relief by the MECP from residential sampling during the two sampling periods. The relief was granted based on our history of low lead results and the strength of the corrosion control program in place at our facilities. However, distribution samples were still collected and tested for lead: 24 distribution sites were sampled. The results ranged from a minimum of non-detection (below 0.1) to a maximum of 0.4 against the regulated standard of 10 parts per billion (ppb, or µg/L).

CGS has achieved reduced sampling for lead testing in all systems except for the Sudbury DWS, fed by the Wanapitei and David St. WTPs. These sections must continue to be sampled not due to the quality of the water but to satisfy the section of the regulation stating minimum sampling requirement as a function of population served by that system. CGS continues to provide corrosion control to its DWS that require the chemical treatment and this program has proven its success with the low lead laboratory results.

Water quality throughout all systems is monitored twenty-four hours a day, 365 days a year. Regular sampling schedules are followed in accordance with O. Reg. 170/03, our Municipal Drinking Water Licences and Permits. The treated water is fluoridated to prevent tooth decay in all DWS as PHSD mandates this requirement.

System Specific

Drinking Water Services within the City of Greater Sudbury is a combination of municipally owned and operated utilities along with the supply of purchased potable water. CGS owns and operates two surface water treatment plants along with its distribution systems, six ground water treatment well fields along with their own distribution systems and one independent distribution system conveying purchased potable water from Vale's Vermilion Water Treatment Plant.

Table 1 - Overview of the City's Water Systems

Drinking Water System	Type of Facility	Source of Water	Communities Served
Sudbury DWS – Wanapitei	Class IV Surface water conventional treatment plant and Class IV Distribution system	Wanapitei River	Sudbury, Coniston, Wanapitei, Markstay, Garson West
Sudbury DWS - David	Class III Surface water Membrane Filtration Plant and Class II Distribution system	Ramsey Lake	Sudbury (West and South sections)
Sudbury DWS - Garson	Class I Wells and Class II Distribution system	Groundwater	Garson East (east of Penman Dr.)
Dowling DWS	Class I Wells and Class I Distribution system	Groundwater	Dowling
Valley DWS	Class I Wells and Class II Distribution system	Groundwater	Valley East, Azilda, Chelmsford & Capreol
Falconbridge DWS	Class I Wells and Class II Distribution system	Groundwater	Falconbridge
Onaping /Levack DWS	Class I Wells and Class II Distribution system	Groundwater	Onaping & Levack
Vermilion Distribution System	Class II Distribution System	Vermilion River WTP Owned and Operated by Vale	Lively, Naughton, Whitefish, Copper Cliff, Walden Industrial Park

Sudbury Drinking Water System 210001111 - Wanapitei

The Sudbury DWS is comprised of three different water sources; the Wanapitei Water Treatment Plant (WTP), the David WTP and the Garson Well Field.

The Wanapitei WTP is a conventional surface plant located between Coniston and Wahnapitae. Its source water is from the Wanapitei River. The plant's rated capacity is 54,000 m^3/day and provides approximately sixty percent of the surface water in the Sudbury DWS. The treatment process follows these steps:

Raw river water is screened through coarse and fine screens. Five pumps convey the raw water several kilometers to the plant for treatment.

At the plant, the raw water is initially disinfected by chlorination. The chlorine gas is switched to chlorine dioxide (ClO_2) during the summer months to reduce tastes and odours in the water. The water's pH and alkalinity are controlled by the addition of lime. A coagulant (alum) and flocculant (polymer) are added to remove colloidal solids that are in suspension. Sedimentation is a separation by gravity of clarified water and sludge. The settled sludge waste is pumped to a nearby sewage lagoon for treatment and the clarified water is sent to four filters.

The filtration process is to remove the smaller particles that did not settle. The filtration media is a mixture of silica sand and anthracite coal.

The filtered water flows into a reservoir where lime is added to adjust the final pH and alkalinity along with addition of a corrosion control chemical. Fluoride is added as mandated by PHSD.

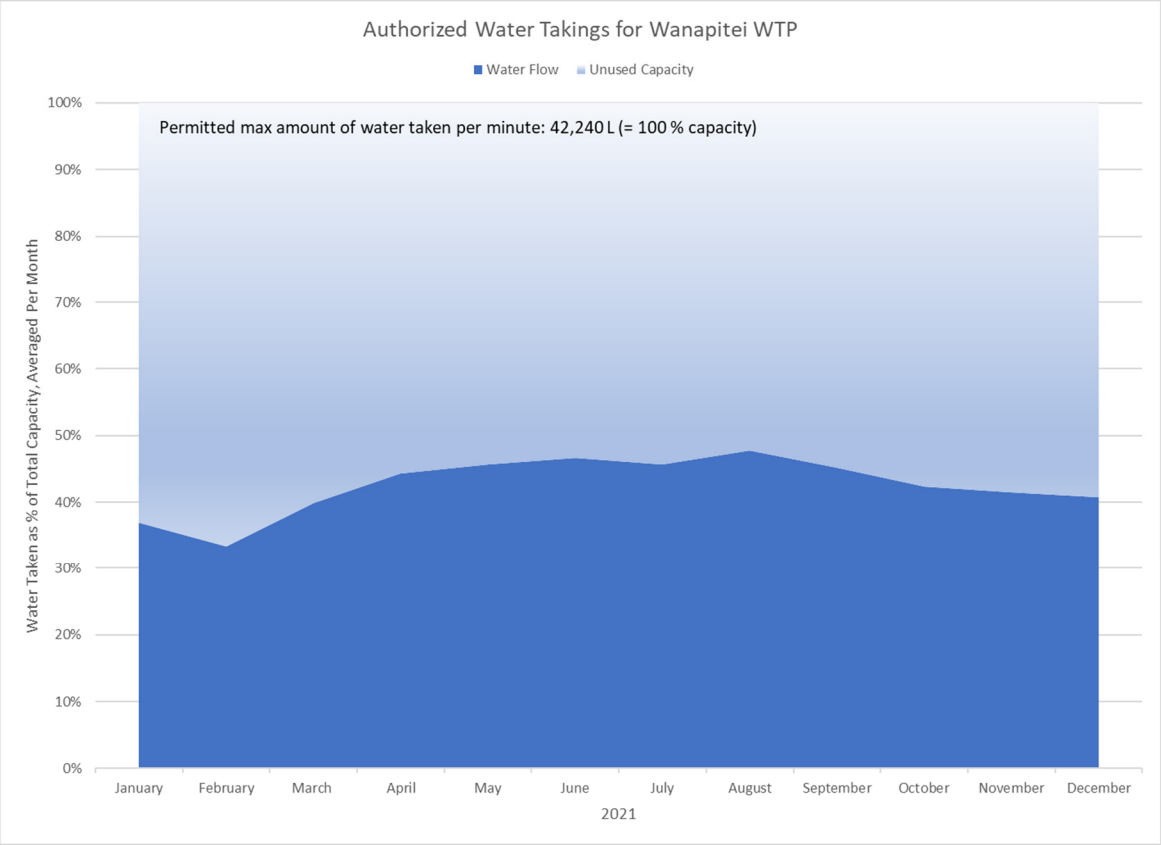
Chlorine is added at this stage to ensure final disinfection of finished water and to maintain a residual disinfectant within the distribution system.

The treated water is pumped through ultraviolet (UV) light disinfection units to provide extra inactivation of pathogens.

The treated water is pumped to the distribution system by six vertical turbine pumps and directs the water east towards the community of Markstay, west towards the community of Coniston, to the city of Sudbury and the Ellis Reservoir.

Non-Compliance with Act, Regulations, Order or Approvals

In 2021, the Wanapitei system had 2 AWQIs. The first incident was the installation of a bib system in order to fill Ellis Reservoir during a critical watermain break. The bib was super-chlorinated, flushed and chlorine residual and bacterial samples were taken. The MECP granted permission to put the bib system online before awaiting the bacterial results based on the rigorous installation protocol applied. The second was the presence of Total Coliforms and *E. coli* (together referred to as bacterial samples) at a hydrant after a water main repair. The hydrant was flushed, and two sets of bacterial samples were taken 24 hours apart at the hydrant in question and at a close point upstream and another close point downstream. All subsequent samples came back negative.



Annual Flow Summary

Wanapitei WTP						
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	617,765	19,928	21,268	389.6	54,000	36.9
February	504,930	18,033	20,709	293.6	54,000	33.4
March	667,456	21,531	24,643	400.8	54,000	39.9
April	718,380	23,946	25,326	391.7	54,000	44.3
May	763,340	24,624	26,181	439.9	54,000	45.6
June	755,003	25,167	30,916	405.3	54,000	46.6
July	764,938	24,675	26,730	387.9	54,000	45.7
August	798,363	25,754	30,996	452.0	54,000	47.7
September	732,697	24,423	27,653	467.0	54,000	45.2
October	708,553	22,857	25,808	423.6	54,000	42.3
November	672,892	22,430	30,342	463.2	54,000	41.5
December	682,102	22,003	23,806	408.5	54,000	40.7
Total	8,386,418				AVERAGE %	42.5

Sudbury Drinking Water System 220003537- David Street

Part of the Sudbury DWS, the David St. WTP is a membrane ultra-filtration surface water treatment plant. The plant's rated capacity is 40,000 m^3/day and provides approximately forty percent of the surface water in the Sudbury DWS. It is normal for Wanapitei WTP and David St. WTP to operate at a 60/40 ratio within the Sudbury DWS.

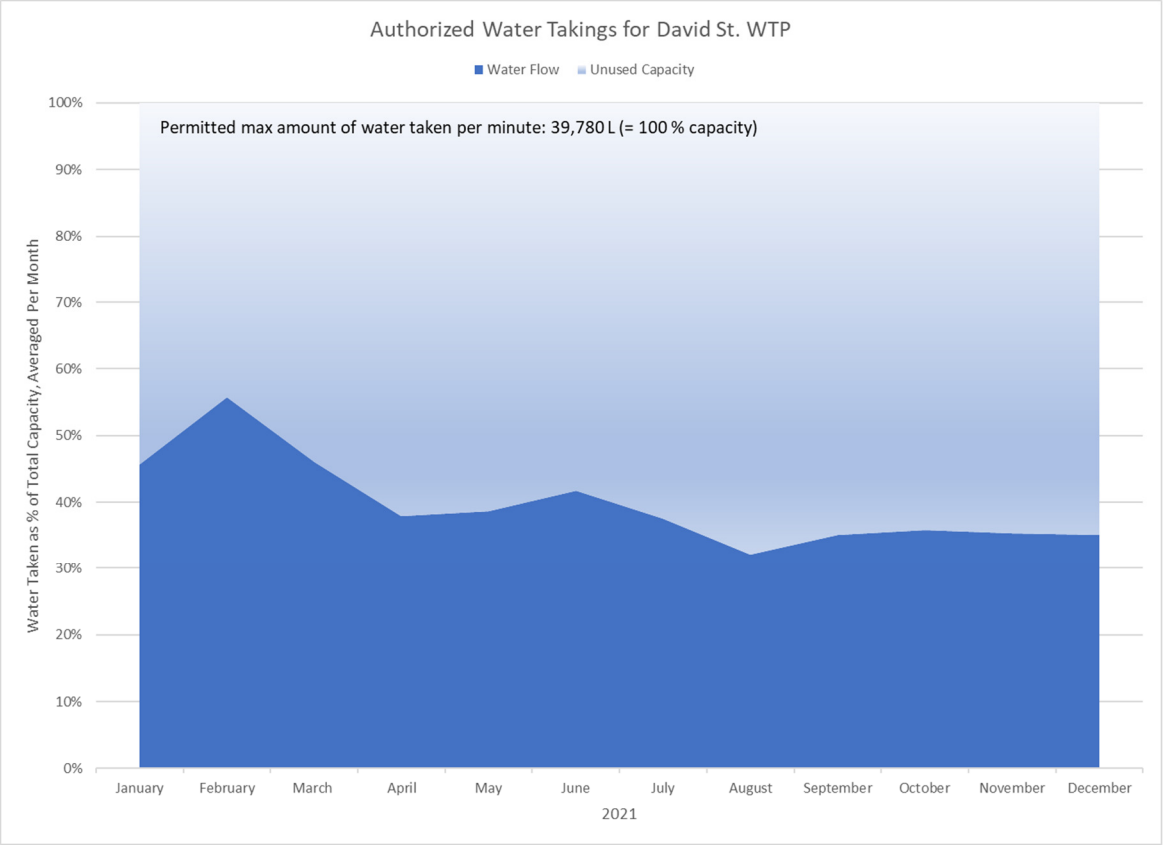
The raw water intake is located approximately three hundred meters distance from the shores of Ramsey Lake. The treatment process follows these steps:

Raw lake water is screened through coarse screens and two strainers. The water is initially disinfected by chlorination (sodium hypochlorite). Four pumps send the water to membrane trains for ultrafiltration. The filtration process removes particles 0.02 microns (µm) in size or larger. The filtered water flows into a reservoir. Chlorine, as sodium hypochlorite, is added at this stage to ensure final disinfection of finished water and to maintain a residual disinfectant within the distribution system. Fluoride is added to prevent tooth decay along with a corrosion control chemical. The treated water is pumped through UV light disinfection units to provide extra inactivation of pathogens. Sodium hydroxide (caustic) is added to control seasonal pH swings in lake water.

The treated water is pumped to the distribution system by four vertical turbine pumps and sends water to the south, west and downtown sections of the City of Greater Sudbury. Water from this plant is also used to fill the Ellis Reservoir.

Non-Compliance with Act, Regulations, Order or Approvals

In 2021, the David St. system had one AWQI. The incident was a fluoride test of 1.67 mg/L when drinking water quality standard is a maximum of 1.50 mg/L. The plant was stopped, and the surge tank was backflushed before the plant was restarted. A modification has since been made to the fluoride dosing system to prevent future spikes.



Annual Flow Summary

David St. WTP						
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	566,485	18,274	23,674	556.4	40,000	45.7
February	623,942	20,127	38,032	563.0	40,000	55.7
March	571,222	18,427	31,709	627.6	40,000	46.1
April	454,724	14,669	17,147	537.5	40,000	37.9
May	478,997	15,452	18,639	532.6	40,000	38.6
June	501,370	16,173	21,541	566.0	40,000	41.8
July	465,233	15,008	17,977	528.8	40,000	37.5
August	399,277	12,880	14,829	418.0	40,000	32.2
September	421,513	13,597	16,081	501.5	40,000	35.1
October	443,641	14,311	15,688	527.9	40,000	35.8
November	424,241	13,685	16,293	499.7	40,000	35.4
December	435,292	14,042	17,315	554.6	40,000	35.1
Total	5,785,936				AVERAGE %	39.6

Sudbury Drinking Water System 220003485 - Garson

The Garson water works is a groundwater system consisting of three wells for servicing the community of Garson east of Penman Ave and O'Neil Dr East. The three wells are:

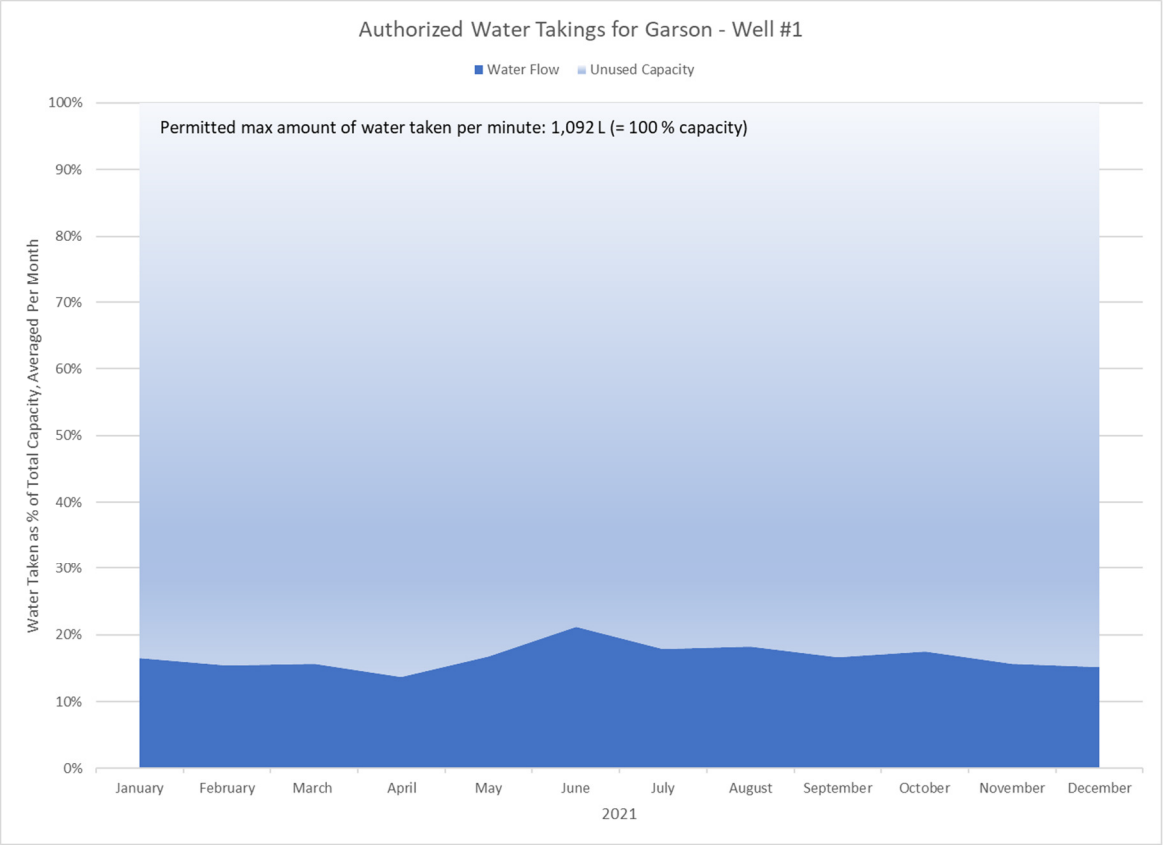
- Garson Well No. 1,
- Garson Well No. 2, and
- Garson Well No. 3.

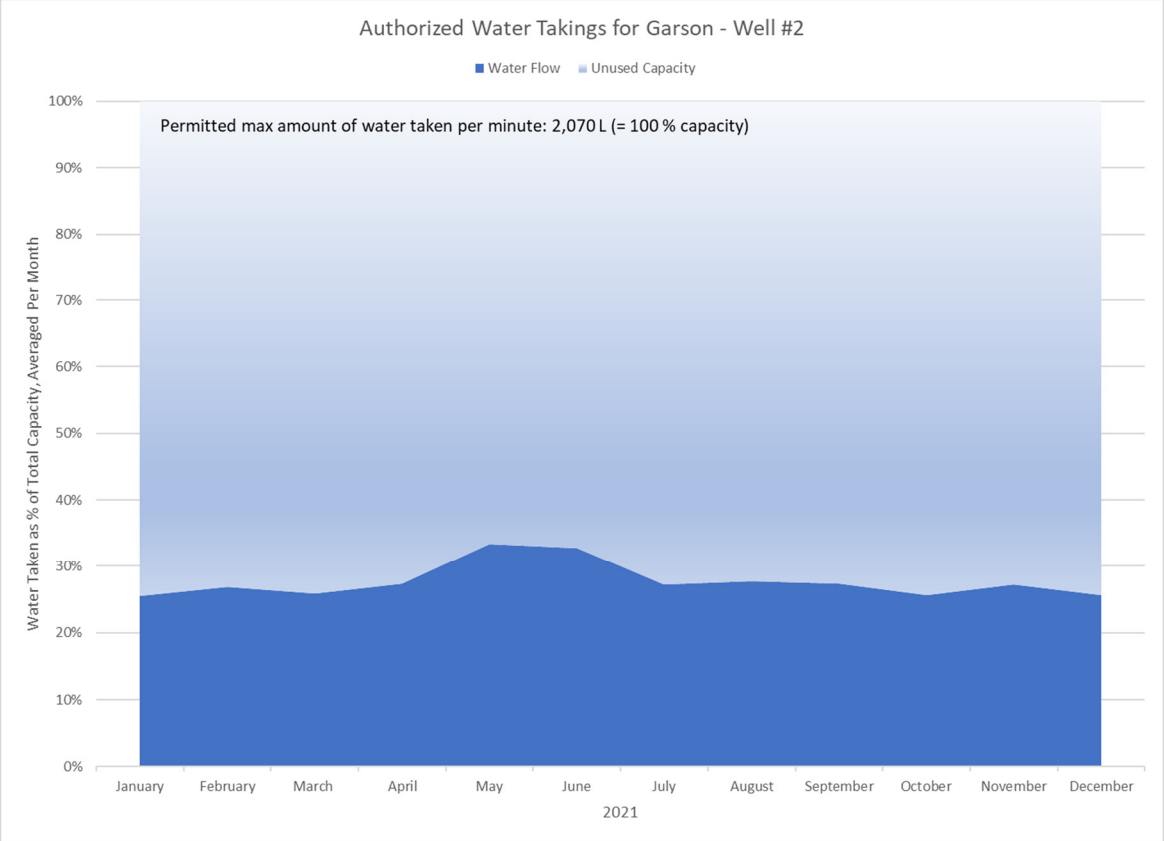
The system includes three vertical turbine well pumps, disinfection with sodium hypochlorite and fluoride injection as mandated by PHSD. The water is directly connected to the public distribution network. The distribution network extends from Skead Road to the north to Garson-Coniston Road to the south. The pipe network is connected to the water supply from the Sudbury distribution system at the intersection of Falconbridge Road and O'Neil Drive West, therefore the community is serviced from the Sudbury distribution system west of Penman Avenue. The Garson system is connected to the Sudbury distribution system through a pressure regulating valve which opens when it detects low pressure on either side. This can occur if the Garson wells or Maley Booster fail, or if there is a major watermain break. Otherwise, the Garson system operates separately from the Sudbury distribution system even though it belongs to the Sudbury DWS.

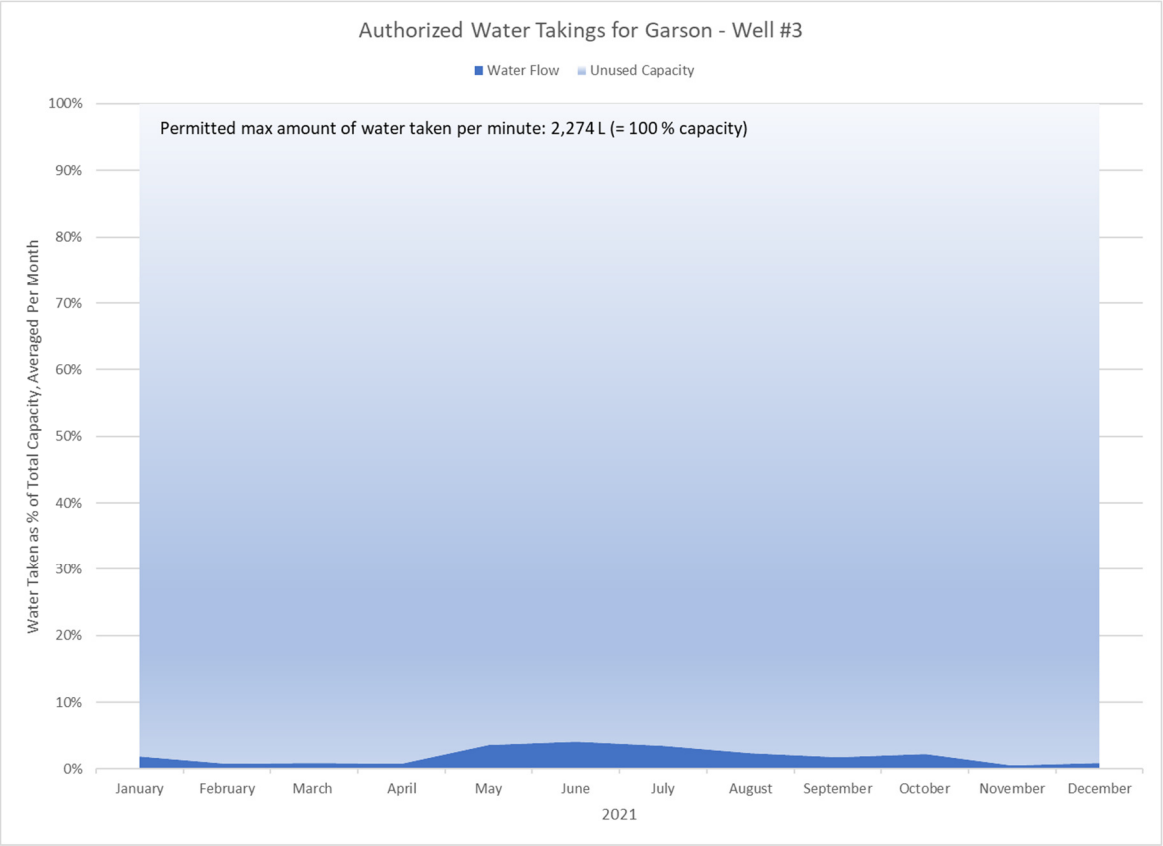
In March 2001, a hydrogeological assessment was made of each of the wells which concluded that it is unlikely that any of them are under the direct influence of surface water. The raw water was therefore found to be in general conformance with the Ontario Drinking Water Standards (ODWS). Notwithstanding the historical good water quality, the aquifer used in the Garson well supply has a recharge area which includes the developed area of Garson. With direction and consultation from PHSD and the MECP, CGS committed to undertaking a groundwater monitoring program for tetrachloroethylene (TCE). Although TCE levels found during audit sampling are well below regulatory limits, CGS is proactively sampling and monitoring these levels. In 2012 four monitoring wells were drilled in the area and sampling and graphing of results is completed regularly by staff to augment historical data and to ensure the safety of the water source and public. In 2017 CGS retained a consultant to provide feasibility options for treatment of TCE and the possibility of feeding this system directly from the two surface plants. We are currently in the design stage of this project. In the meantime, Well #3 is being underutilized as it has the highest concentration of TCE.

Non-Compliance with Act, Regulations, Order or Approvals

Garson had one AWQI in 2021. A sodium test result was 55.4 mg/L and above the standard of 20 mg/L. Another sample was taken to ensure the result and the site will be monitored as per regulatory requirements.


Authorized Water Takings for Garson - Well #1
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,092 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
2021


Authorized Water Takings for Garson - Well #2
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,070 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
2021



Annual Flow Summary

Garson Well #1						
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	8,068	260	489	16.1	1,572	16.6
February	6,764	242	494	17.9	1,572	15.4
March	7,631	246	482	15.7	1,572	15.7
April	6,474	216	399	16.3	1,572	13.7
May	8,194	264	409	15.8	1,572	16.8
June	10,009	334	665	17.9	1,572	21.2
July	8,698	281	375	18.6	1,572	17.8
August	8,869	286	361	16.0	1,572	18.2
September	7,866	262	422	15.8	1,572	16.7
October	8,551	276	427	17.1	1,572	17.5
November	7,418	247	437	16.1	1,572	15.7
December	7,385	238	430	15.3	1,572	15.1
Total	95,928				AVERAGE %	16.7

Garson Well #2						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	23,621	787	1,126	30.3	2,981	25.6
February	22,436	801	975	33.1	2,981	26.9
March	23,906	771	964	31.5	2,981	25.9
April	24,465	816	1,100	37.3	2,981	27.4
May	30,864	1,029	2,082	37.3	2,981	33.4
June	29,346	978	1,286	37.5	2,981	32.8
July	25,141	811	1,191	32.9	2,981	27.2
August	25,617	826	1,029	36.4	2,981	27.7
September	24,462	815	1,298	37.4	2,981	27.4
October	23,708	765	1,042	31.5	2,981	25.7
November	24,322	811	948	32.0	2,981	27.2
December	23,680	764	886	32.1	2,981	25.6
Total	301,569				AVERAGE %	27.7

Garson Well #3						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	1,965	63	367	31.2	3,275	1.9
February	745	27	291	33.4	3,275	0.8
March	969	31	299	28.8	3,275	1.0
April	775	26	261	33.8	3,275	0.8
May	3,735	120	949	33.2	3,275	3.7
June	4,040	135	870	35.1	3,275	4.1
July	3,520	114	739	31.1	3,275	3.5
August	2,459	79	739	30.9	3,275	2.4
September	1,769	59	714	32.0	3,275	1.8
October	2,340	75	672	29.0	3,275	2.3
November	516	17	102	28.9	3,275	0.5
December	985	32	287	28.1	3,275	1.0
Total	23,817				AVERAGE %	2.0

Dowling Wells and Distribution System 210001665

The water supply source for the Dowling wells is an unconfined aquifer of sand and gravel deposits located within the Onaping river watershed. Due to the unconfined nature of the soils and the proximity to the river, the MECP has characterized the water source as potentially groundwater under the direct influence of surface water (potentially GUDI).

Studies were conducted in 2002 with the resulting submission of a GUDI study on July 1, 2002. This study was reviewed and accepted by the MECP and as a result, both wells were deemed to be GUDI with effective in situ filtration. As such, the additional treatment of UV irradiation was added to enhance disinfection to comply with the treatment requirements.

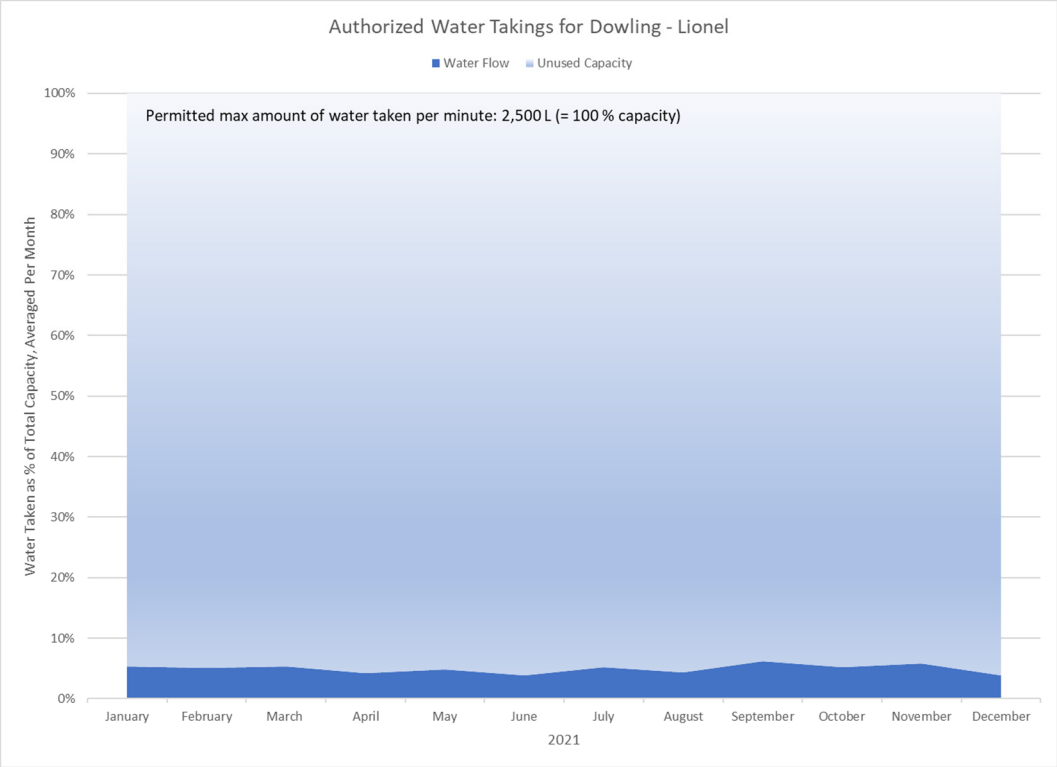
The water works includes two wells, a distribution network and an elevated water storage tank.

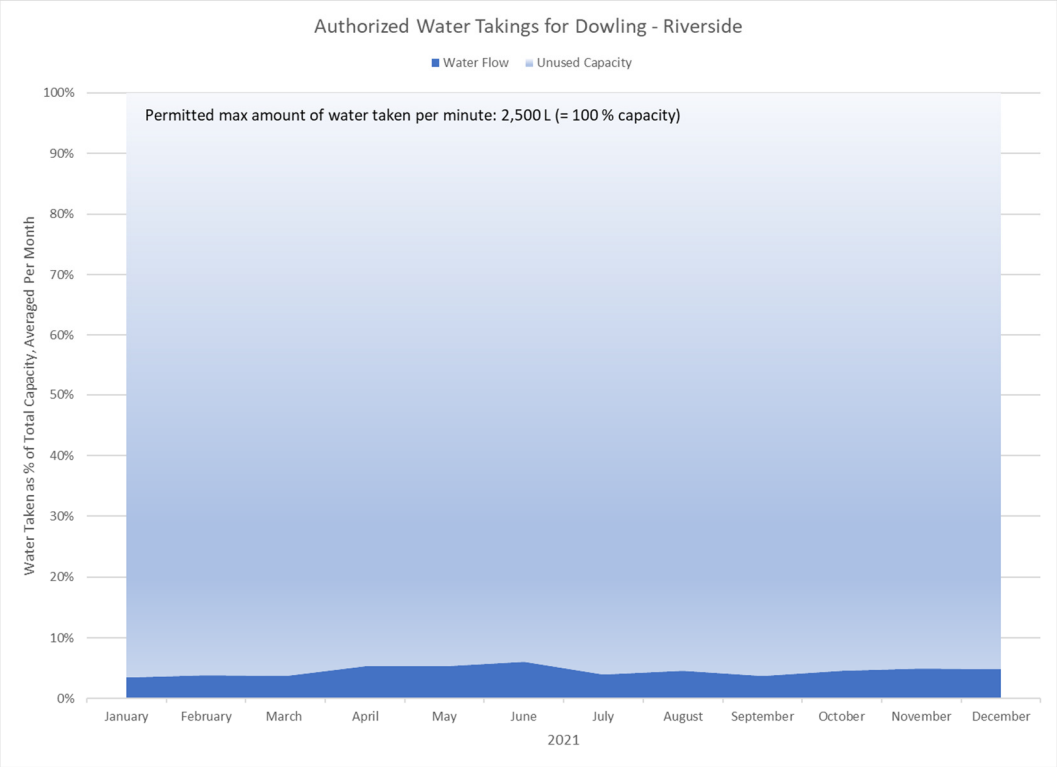
The treatment process follows these steps:

The system includes per well site, one well pump, disinfection with chlorine gas, UV irradiation along with fluoride injection as mandated by PHSD. The distribution network in Dowling has been relatively reliable and is not exposed to frost depths as severe as other areas of the City. Further, the elevated water storage provides a measure of security to the water system in the event of power interruptions and watermain breaks.

Non-Compliance with Act, Regulations, Order or Approvals

The Dowling system had no AWQIs in 2021.


Authorized Water Takings for Dowling - Lionel
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,500 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
2021


Authorized Water Takings for Dowling - Riverside
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,500 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
2021

Annual Flow Summary

Lionel Well						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	6,049	195	521	23.9	3,640	5.4
February	5,231	169	546	23.1	3,640	5.1
March	6,033	195	542	23.1	3,640	5.3
April	4,689	151	551	22.7	3,640	4.3
May	5,467	176	608	21.4	3,640	4.8
June	4,168	134	509	23.5	3,640	3.8
July	5,838	188	525	23.5	3,640	5.2
August	4,939	159	551	22.7	3,640	4.4
September	6,814	220	558	22.3	3,640	6.2
October	5,855	189	545	22.7	3,640	5.2
November	6,404	207	561	23.1	3,640	5.9
December	4,299	139	591	21.9	3,640	3.8
Total	65,787				AVERAGE %	5.0

Riverside Well						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	3,887	125	486	33.8	3,640	3.4
February	3,963	128	513	33.4	3,640	3.9
March	4,262	137	509	33.4	3,640	3.8
April	5,809	187	537	33.4	3,640	5.3
May	6,073	196	562	33.0	3,640	5.4
June	6,704	216	535	31.8	3,640	6.1
July	4,488	145	487	31.3	3,640	4.0
August	5,247	169	488	31.3	3,640	4.6
September	4,150	134	559	32.6	3,640	3.8
October	5,244	169	553	32.2	3,640	4.6
November	5,470	176	525	32.2	3,640	5.0
December	5,512	178	530	32.6	3,640	4.9
Total	60,809				AVERAGE %	4.6

Blezard Valley/Capreol Drinking Water System-210000737

In 2010, the Blezard Valley and Capreol well supply systems were determined to be one single system as both systems are connected. As such one Municipal Drinking Water Licence and Works Permit has been assigned to the entire system. This report will identify the works by geographical area where appropriate.

The Blezard Valley portion of the system is a multi-well groundwater system servicing the communities of Hanmer, Blezard Valley, Val Therese, Val Caron, McCrea Heights, Azilda and Chelmsford. Eleven groundwater wells are situated throughout the Hanmer and Val Therese area. The communities are interconnected with distribution piping and the system feeds three water storage tanks located in Val Caron, Azilda and Chelmsford. This well field extends approximately 7.5 km (west to east) from Val Therese to Hanmer.

Some of the wells are located immediately adjacent to residential homes, commercial establishments and major arterial roadways. The water quality is beginning to show the effects of urbanization such as sodium residuals higher than the provincial standard. Public education sessions and bylaws have been implemented in attempts to mitigate the quality of source water.

The Blezard wells are:

- Deschene,
- Kenneth,
- Philippe,
- Frost,
- Notre Dame,
- Linden,
- Pharand,
- Michelle,
- Chenier,
- R-Well, and
- I-Well (offline for 2021)

The treatment process follows these steps:

The system includes per well site, one well pump, disinfection with chlorine gas, UV irradiation along with fluoride injection as mandated by PHSD. The distribution network has been relatively reliable. It is to be noted that all the wells producing water are before the Val Caron tank. One trunk main feeds all the water production to the two other tanks in Azilda and Chelmsford.

The eleventh well, I-Well, has not been in use for some time. Raw water quality has shown elevated iron and manganese that compromises the aesthetic quality of the water. Studies are currently being conducted on methods of removal in order to re-introduce the well into production in the future.

The Capreol Well portion of the system draws water from two wells to service the community of Capreol. The Capreol wells are:

- M-Well, and
- J-Well.

The treatment process follows these steps:

The Capreol portion of the system is a multi-well groundwater system servicing the community of Capreol. They are situated on the east side of Greens Lake. Like the Dowling wells, hydrogeological studies found these wells to be potentially GUDI with effective in situ filtration and as such required UV irradiation.

The system includes per well site, one vertical turbine well pump, disinfection with chlorine gas, UV irradiation, polyphosphate for corrosion control along with fluoride injection as mandated by PHSD.

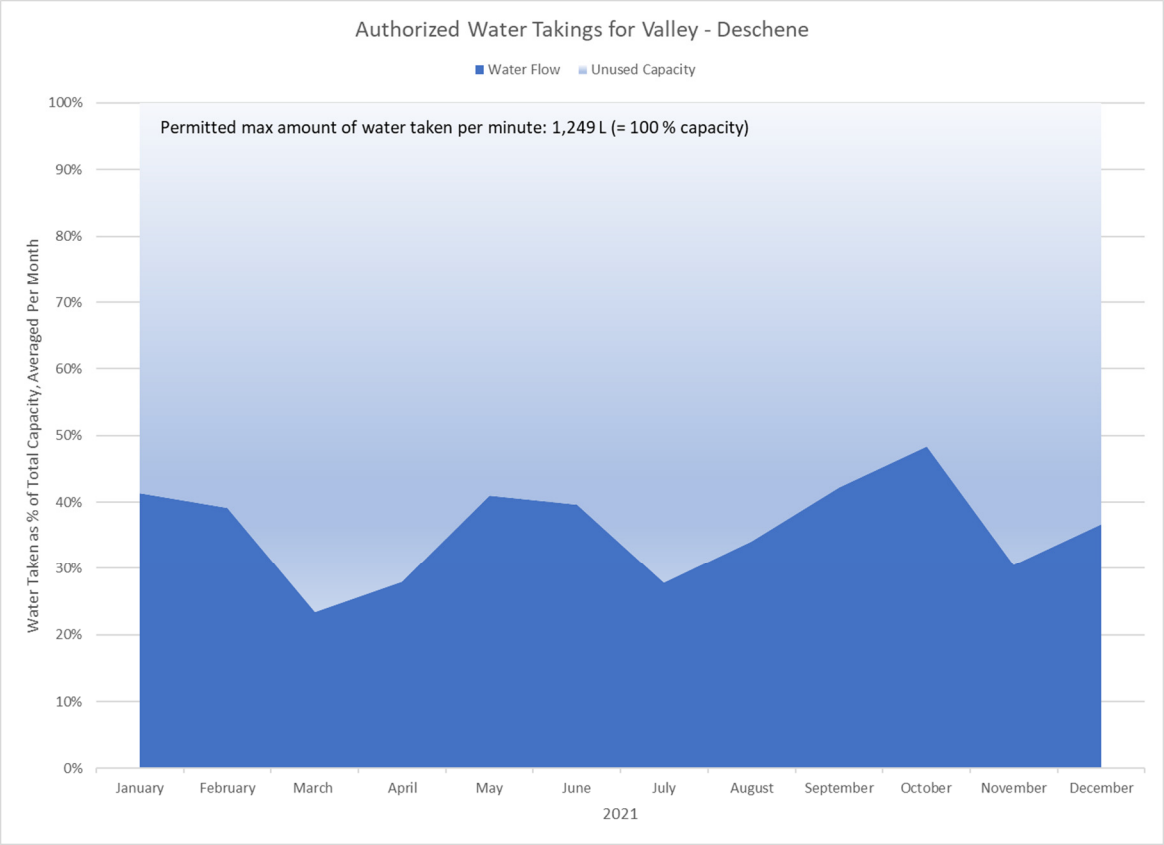
Raw water quality has shown elevated iron and manganese that compromises the aesthetic quality of the water. Removal of these parameters is expected to be available in 2022 as the construction phase of a pilot project to add additional treatment steps is underway.

The Blezard Valley wells can supply water through the Capreol Boosters located onsite at the wells ensuring a continued water supply to the town of Capreol in the event the two wells are unavailable.

The distribution system in Capreol was developed in conjunction with the growth of industry in the area and, as such, some of the pipe network is relatively old. The frost depths in Capreol extend to extreme depths during cold winters, which impose additional stresses on the integrity of the system. A second water main was added to the distribution system from the well as a contingency.

Non-Compliance with Act, Regulations, Order or Approvals

The Blezard Valley/Capreol system had 4 AWQIs in 2021. One AWQI was for a watermain break that dropped the pressure to 10 psi in one section where 10 residents went without water. Verbal and written notices were given to the affected residents, the break was repaired, a hydrant was continuously flushed, and two bacterial samples were taken 24 hours apart. All samples came back negative. Two other incidents were total coliforms in the distribution. Areas were immediately resampled including sites upstream and downstream of the point in question and came back negative. The last incident was a fluoride spike of 1.65 mg/L, higher than the standard of 1.50 mg/L. The spike was caused when clearing the air-locked pump.


Authorized Water Takings for Valley - Deschene
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,249 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
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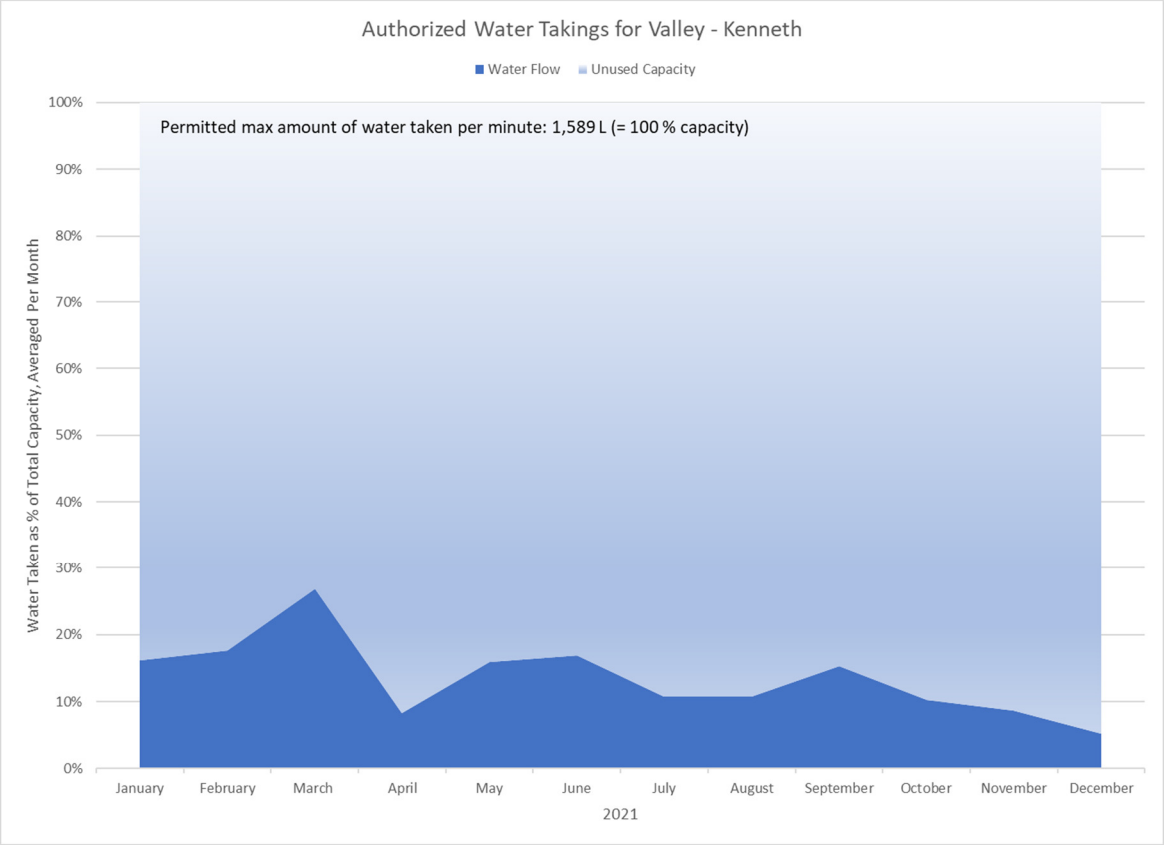
Authorized Water Takings for Valley - Kenneth
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,589 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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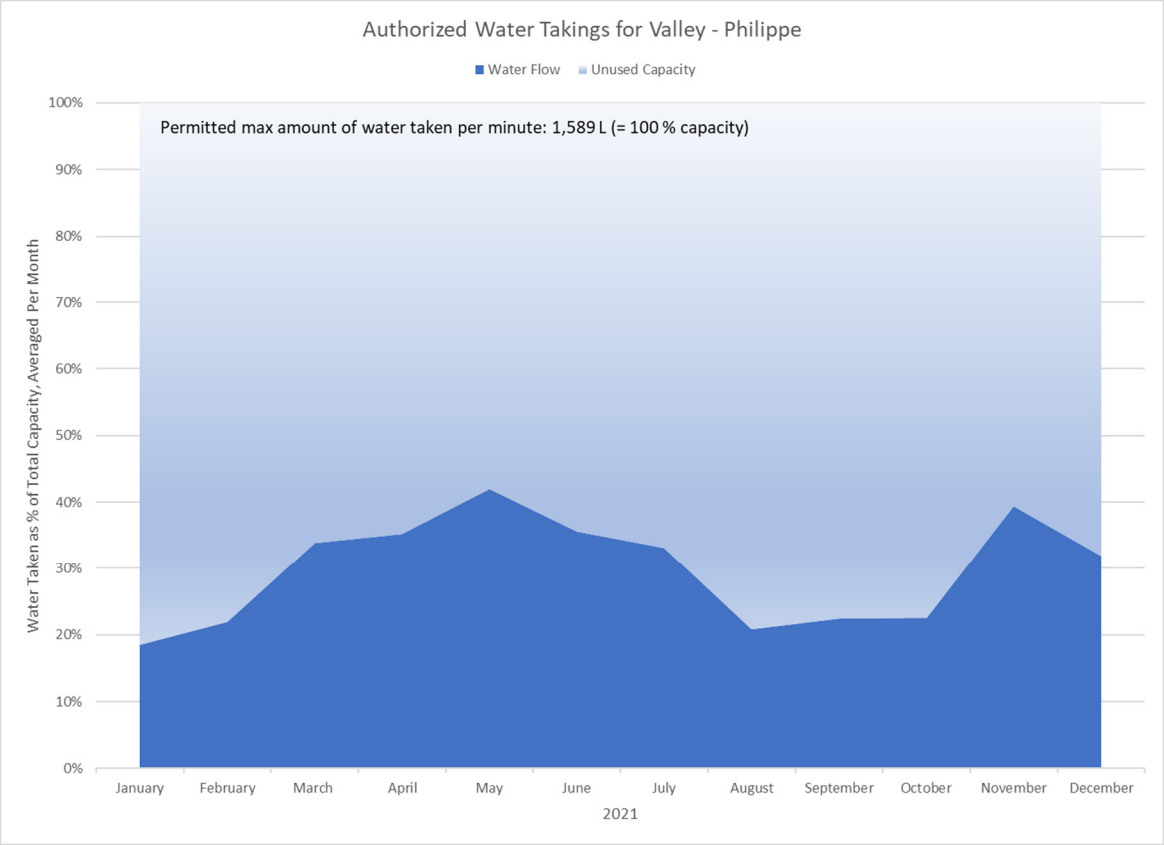
Authorized Water Takings for Valley - Philippe
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,589 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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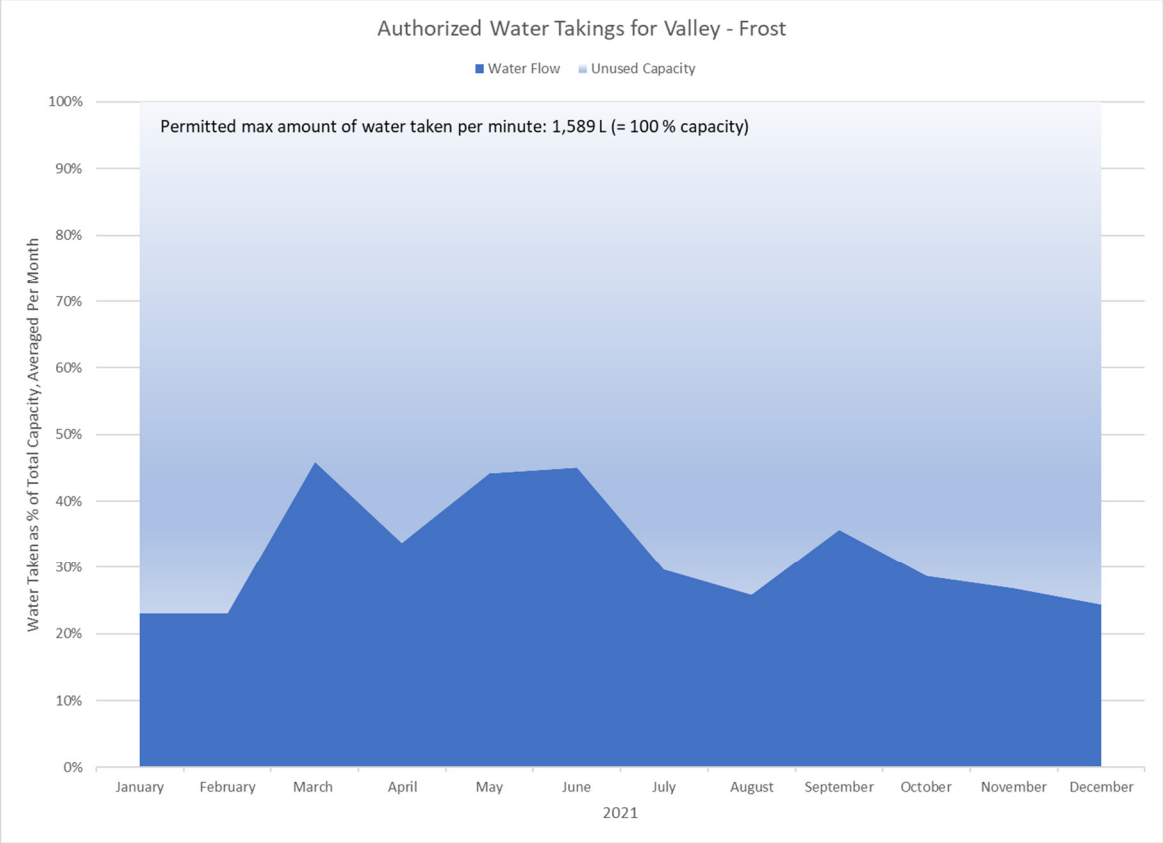
Authorized Water Takings for Valley - Frost
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,589 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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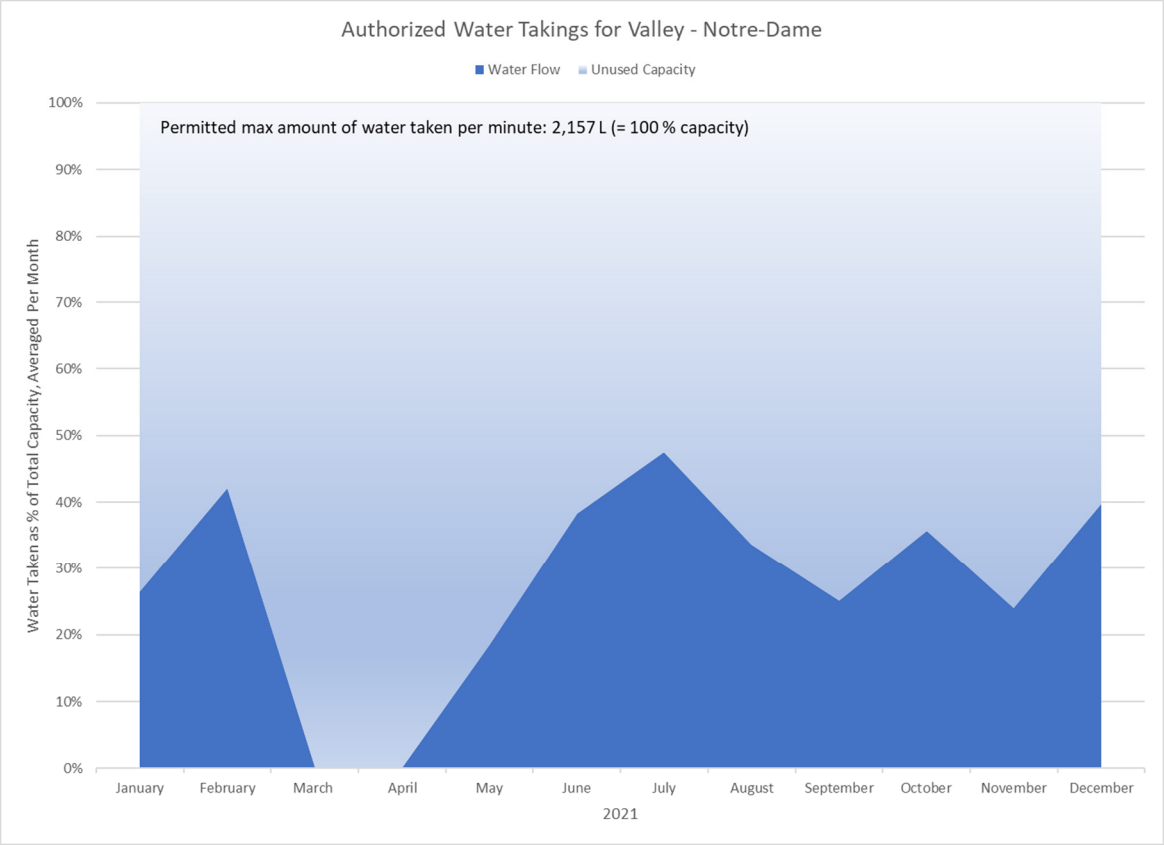
Authorized Water Takings for Valley - Notre-Dame
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,157 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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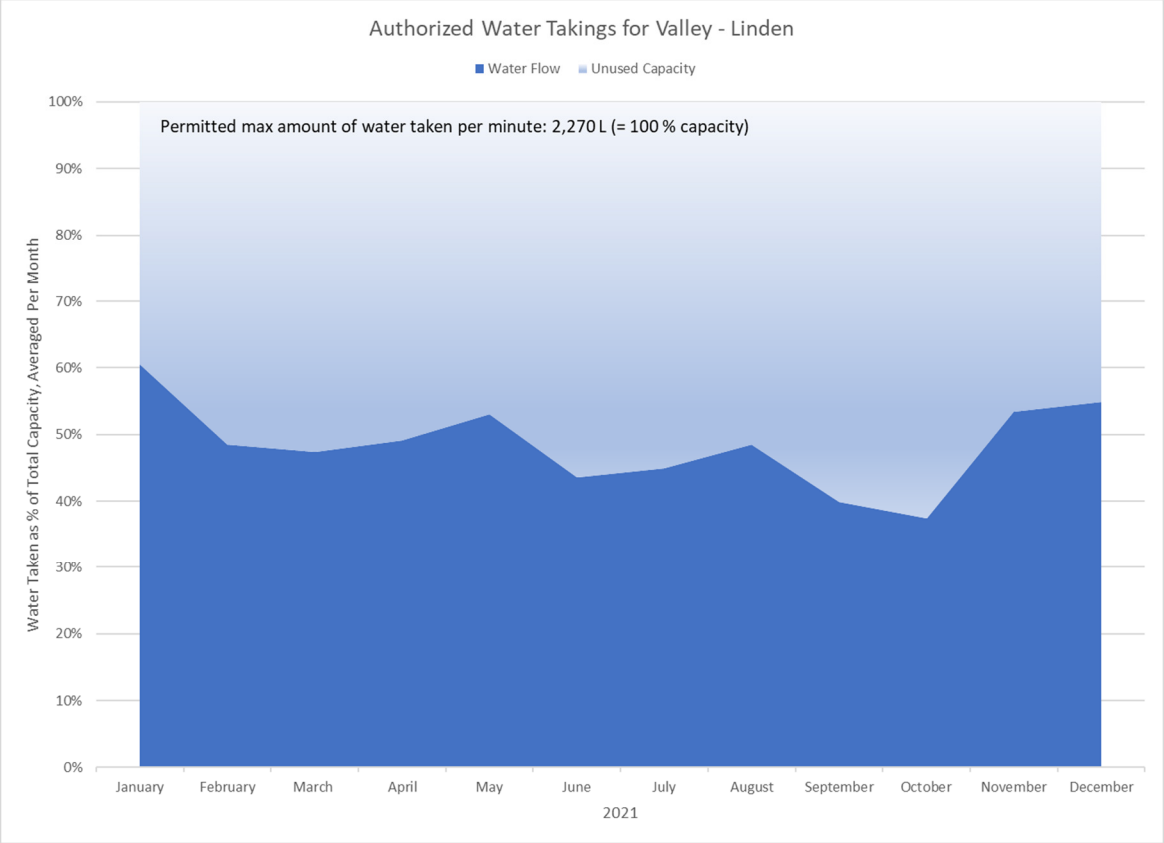
Authorized Water Takings for Valley - Linden
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,270 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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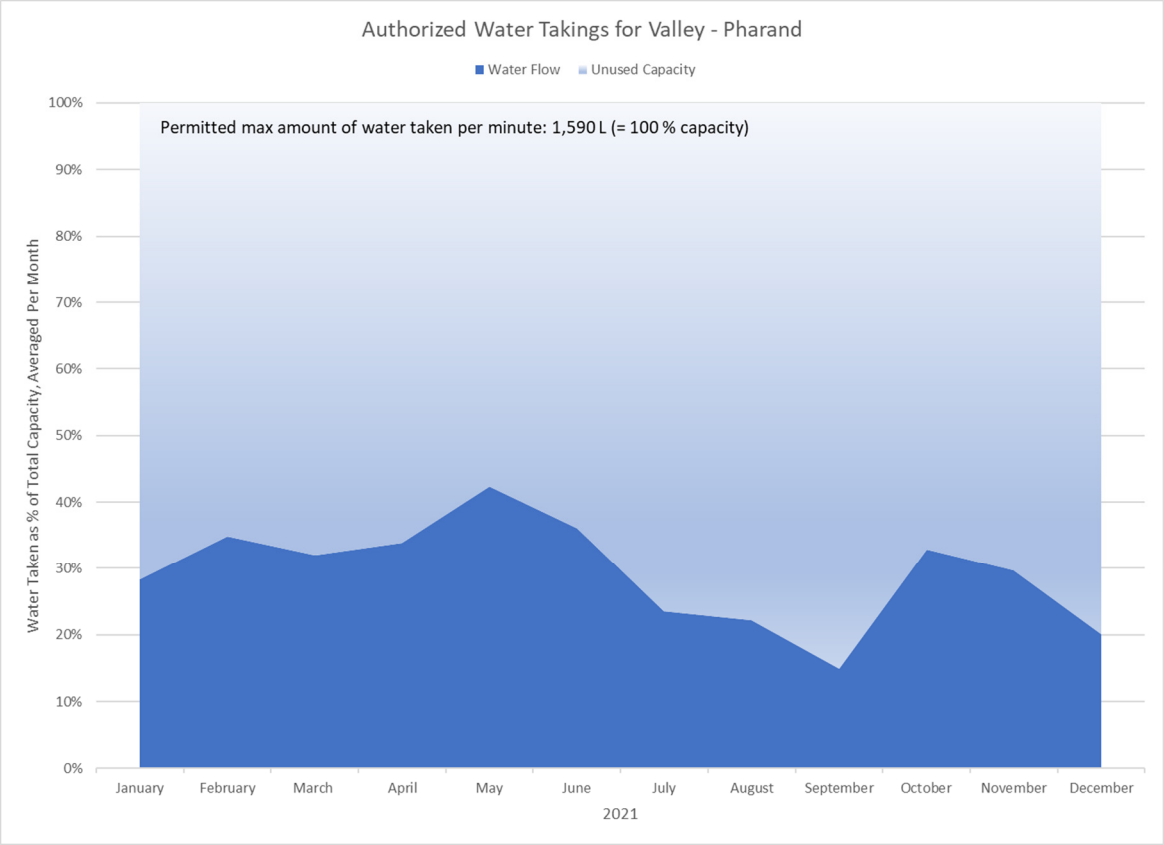
Authorized Water Takings for Valley - Pharand
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,590 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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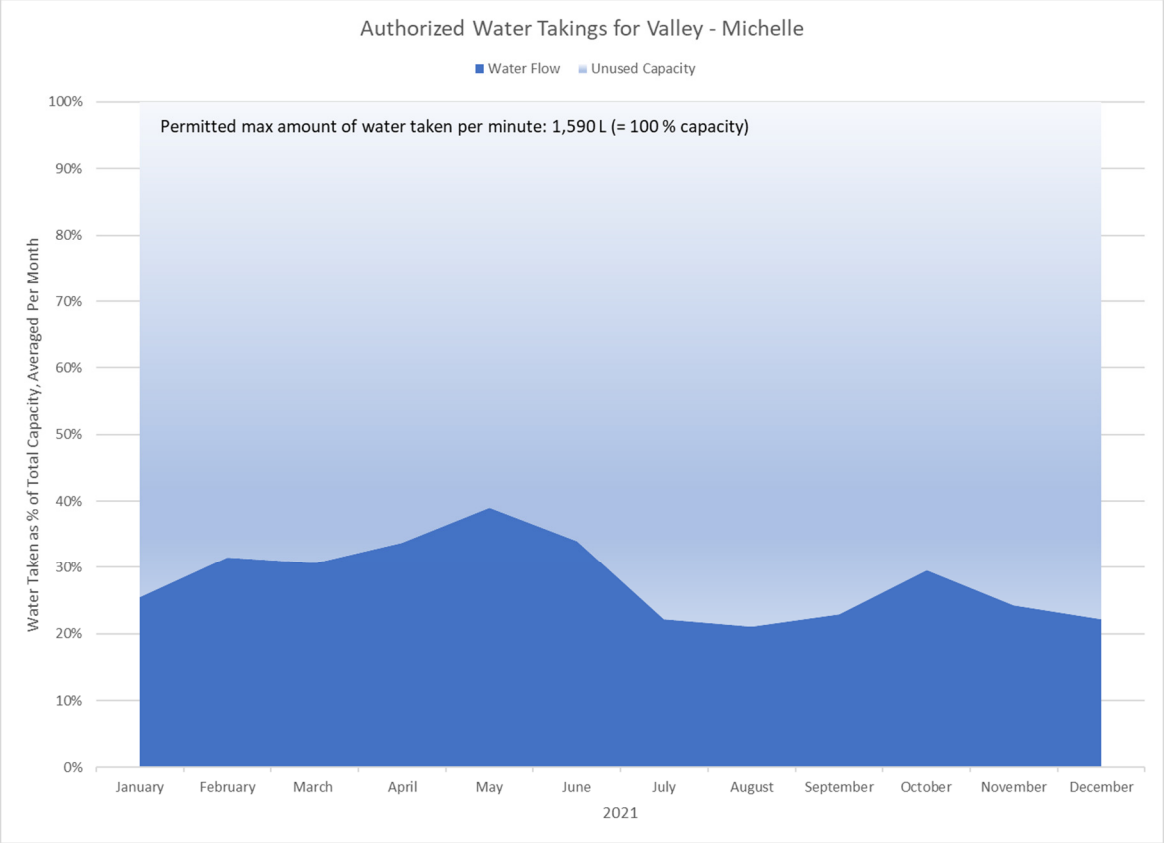
Authorized Water Takings for Valley - Michelle
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,590 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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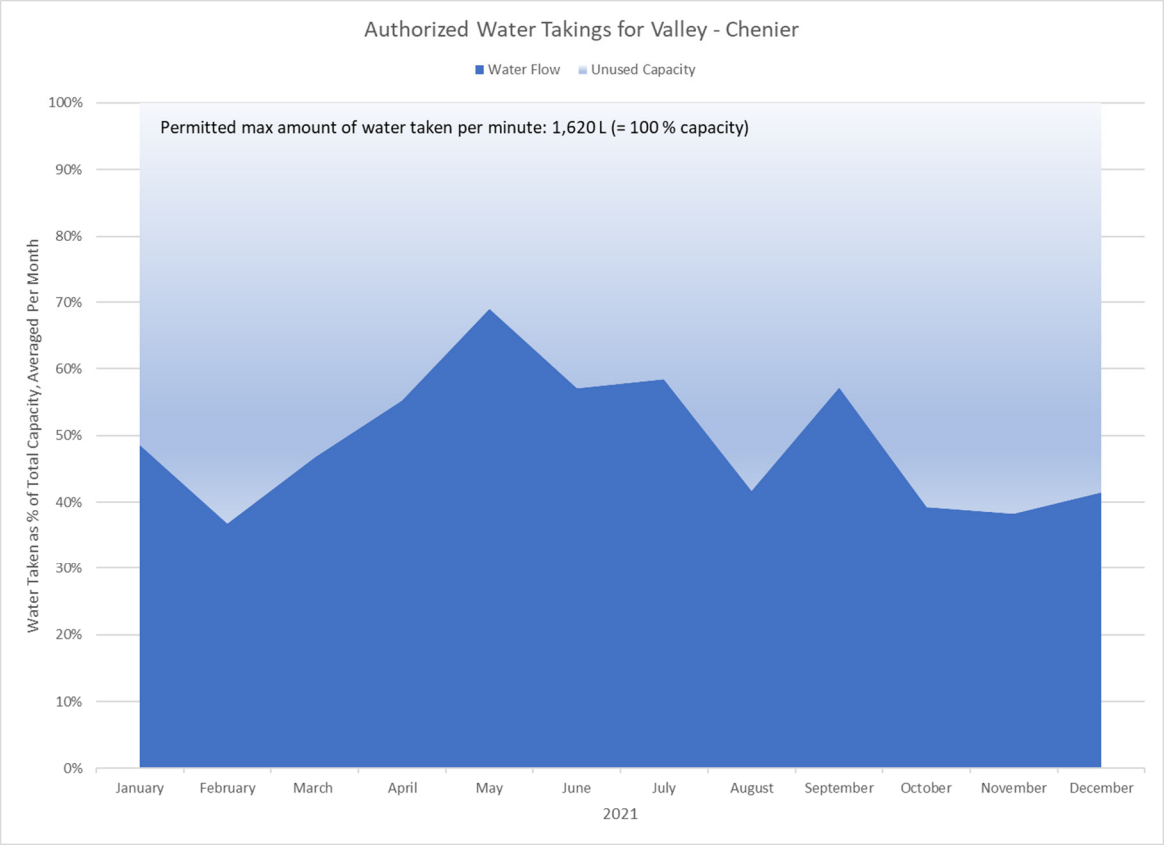
Authorized Water Takings for Valley - Chenier
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 1,620 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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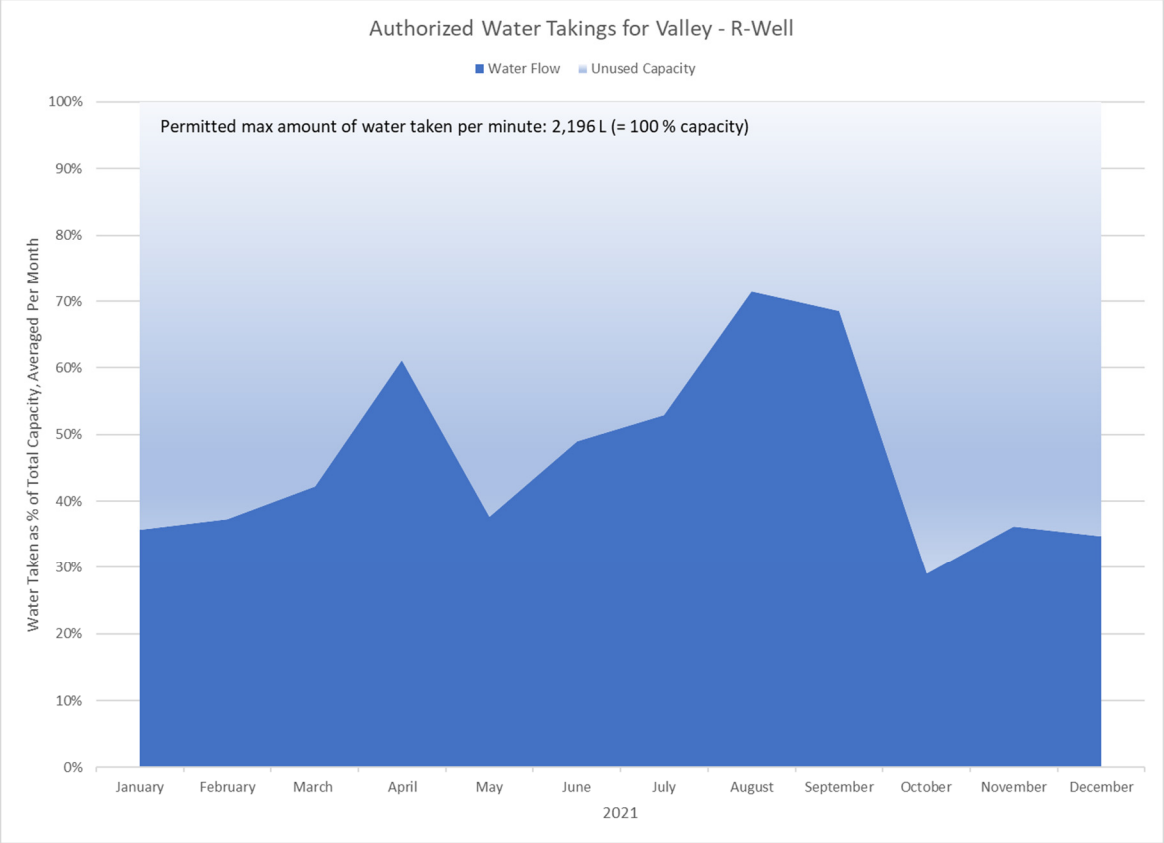
Authorized Water Takings for Valley - R-Well
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,196 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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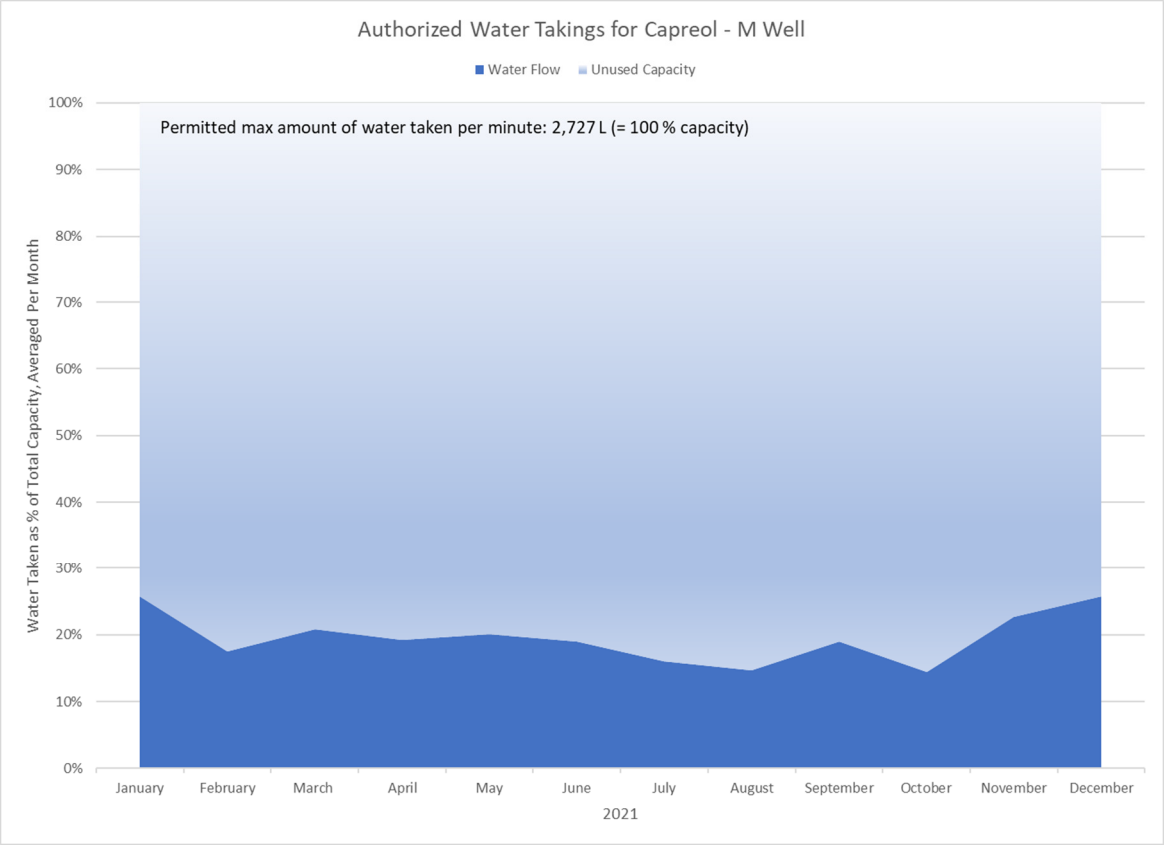
Authorized Water Takings for Capreol - M Well
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,727 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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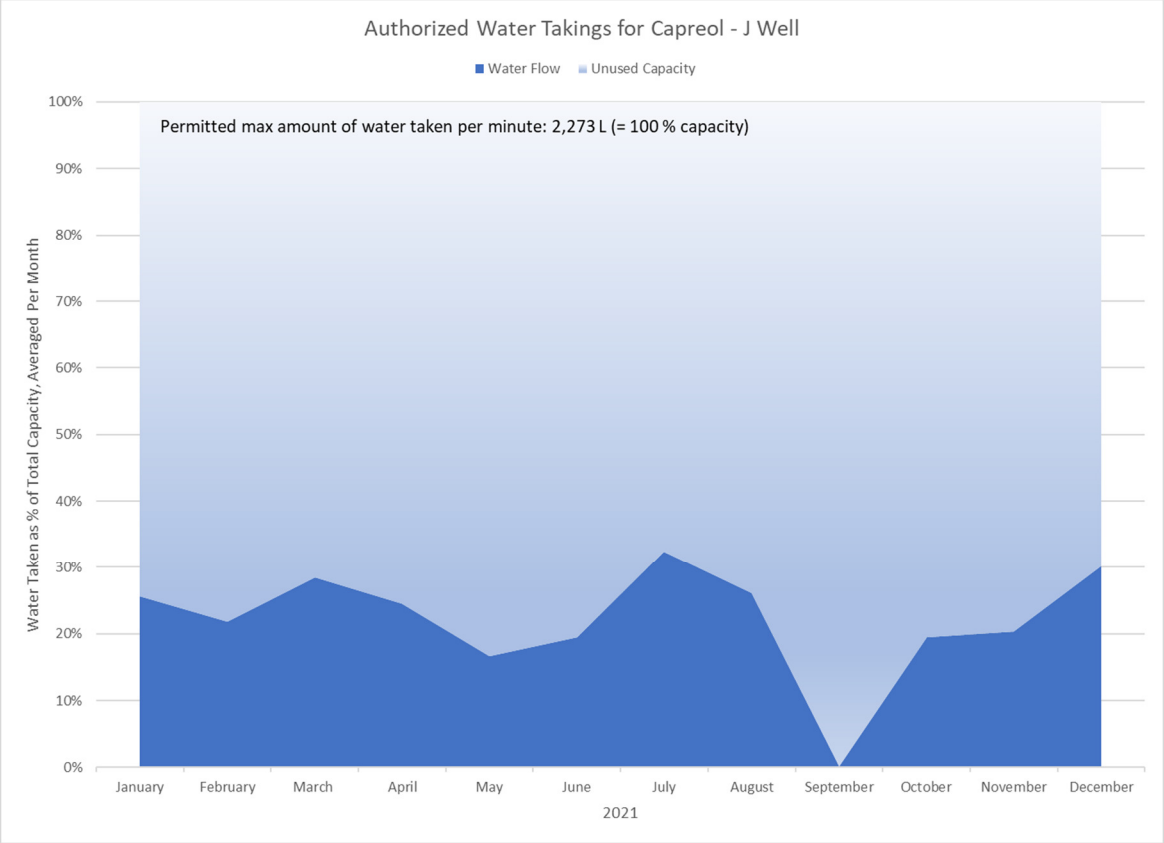
Authorized Water Takings for Capreol - J Well
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 2,273 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
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Annual Flow Summary

Deschene						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	23,037	743	1,481	18.8	1,798	41.3
February	19,697	730	1,386	18.8	1,798	39.1
March	13,059	421	1,358	18.8	1,798	23.4
April	15,113	504	1,014	18.7	1,798	28.0
May	22,826	736	1,391	18.6	1,798	41.0
June	21,386	713	1,459	18.4	1,798	39.7
July	15,513	500	1,448	18.5	1,798	27.8
August	18,994	613	1,436	18.4	1,798	34.1
September	22,788	760	1,449	18.4	1,798	42.3
October	26,974	870	1,447	18.4	1,798	48.4
November	16,442	548	1,348	18.5	1,798	30.5
December	20,417	659	1,472	18.6	1,798	36.6
Total	236,245				AVERAGE %	36.0

Kenneth						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	11,481	370	1,599	23.3	2,288	16.2
February	11,276	403	1,499	22.5	2,288	17.6
March	19,075	615	1,637	23.3	2,288	26.9
April	5,720	191	1,728	23.8	2,288	8.3
May	11,327	365	1,791	23.4	2,288	16.0
June	11,609	387	1,115	23.8	2,288	16.9
July	7,604	245	1,096	25.0	2,288	10.7
August	7,664	247	925	23.8	2,288	10.8
September	10,528	351	1,183	24.5	2,288	15.3
October	7,319	236	1,598	24.2	2,288	10.3
November	5,904	197	763	23.6	2,288	8.6
December	3,713	120	976	23.4	2,288	5.2
Total	113,220				AVERAGE %	13.6

Philippe						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	13,091	422	1,111	25.1	2,288	18.5
February	14,041	501	1,288	56.9	2,288	21.9
March	24,002	774	1,557	25.2	2,288	33.8
April	24,154	805	1,429	24.9	2,288	35.2
May	29,753	960	1,812	25.0	2,288	41.9
June	24,435	814	1,417	24.9	2,288	35.6
July	23,538	759	1,692	25.7	2,288	33.2
August	14,817	478	1,859	24.8	2,288	20.9
September	15,412	514	1,198	25.7	2,288	22.5
October	16,027	517	1,845	24.7	2,288	22.6
November	26,999	900	1,925	24.9	2,288	39.3
December	22,590	729	1,201	25.4	2,288	31.8
Total	248,857				AVERAGE %	29.8

Frost						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	16,382	528	1,226	26.3	2,288	23.1
February	14,730	526	1,676	28.2	2,288	23.0
March	32,594	1,051	1,757	25.2	2,288	46.0
April	23,140	771	1,743	25.0	2,288	33.7
May	31,375	1,012	1,668	25.4	2,288	44.2
June	30,890	1,030	1,776	29.0	2,288	45.0
July	21,011	678	1,703	28.3	2,288	29.6
August	18,374	593	1,714	24.0	2,288	25.9
September	24,493	816	1,717	26.7	2,288	35.7
October	20,383	658	1,726	24.5	2,288	28.7
November	18,408	614	1,294	24.6	2,288	26.8
December	17,269	557	1,365	25.9	2,288	24.3
Total	269,048				AVERAGE %	32.2

Notre Dame						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	25,455	821	1,844	34.6	3,105	26.4
February	36,553	1,179	2,833	35.6	3,105	42.0
March	196	6	110	38.1	3,105	0.2
April	0	0	0	0.0	3,105	0.0
May	17,814	575	2,820	38.4	3,105	18.5
June	35,640	1,188	2,763	36.9	3,105	38.3
July	45,755	1,476	2,795	39.0	3,105	47.5
August	32,307	1,042	2,248	36.2	3,105	33.6
September	23,453	782	2,056	35.0	3,105	25.2
October	34,384	1,109	2,787	35.8	3,105	35.7
November	22,331	744	2,786	35.7	3,105	24.0
December	38,296	1,235	2,804	36.0	3,105	39.8
Total	312,184				AVERAGE %	27.5

Linden						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	61,291	1,977	2,704	32.8	3,269	60.5
February	44,350	1,584	2,694	32.7	3,269	48.5
March	48,049	1,550	2,699	33.0	3,269	47.4
April	48,109	1,604	2,694	33.1	3,269	49.1
May	53,695	1,732	2,691	33.9	3,269	53.0
June	42,746	1,425	2,678	33.4	3,269	43.6
July	45,545	1,469	2,813	80.0	3,269	44.9
August	49,111	1,637	2,691	33.3	3,269	48.5
September	39,129	1,304	2,662	32.9	3,269	39.9
October	37,985	1,225	2,739	33.9	3,269	37.5
November	52,314	1,744	2,766	34.0	3,269	53.3
December	55,597	1,793	2,990	36.8	3,269	54.9
Total	577,920				AVERAGE %	48.4

Pharand						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	20,121	649	1,431	26.8	2,290	28.3
February	22,342	721	2,112	26.5	2,290	34.9
March	22,761	734	1,138	26.9	2,290	32.1
April	23,297	752	1,593	26.5	2,290	33.9
May	30,073	970	1,599	85.0	2,290	42.4
June	24,794	800	1,621	26.5	2,290	36.1
July	16,723	539	1,948	26.6	2,290	23.6
August	15,757	508	2,134	26.4	2,290	22.2
September	10,215	330	990	26.5	2,290	14.9
October	23,346	753	1,305	26.9	2,290	32.9
November	20,359	657	1,027	26.5	2,290	29.6
December	14,281	461	1,294	26.3	2,290	20.1
Total	244,068				AVERAGE %	29.2

Michelle						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	18,095	584	1,228	29.5	2,290	25.5
February	20,223	652	1,285	30.1	2,290	31.5
March	21,769	702	1,246	29.0	2,290	30.7
April	23,197	748	1,689	28.8	2,290	33.8
May	27,735	895	1,405	27.3	2,290	39.1
June	23,346	753	1,500	28.7	2,290	34.0
July	15,706	507	1,255	30.6	2,290	22.1
August	14,995	484	968	28.8	2,290	21.1
September	15,719	507	1,632	31.0	2,290	22.9
October	21,020	678	1,142	30.0	2,290	29.6
November	16,658	537	1,475	27.8	2,290	24.3
December	15,733	508	989	30.3	2,290	22.2
Total	234,195				AVERAGE %	28.0

Chenier						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	35,185	1,135	2,075	27.7	2,333	48.7
February	24,020	858	2,075	27.1	2,333	36.8
March	33,821	1,091	2,075	26.2	2,333	46.8
April	38,660	1,289	2,244	27.7	2,333	55.2
May	49,867	1,609	2,166	27.0	2,333	69.0
June	39,943	1,331	2,075	26.5	2,333	57.1
July	42,301	1,365	2,075	26.9	2,333	58.5
August	30,141	972	1,784	23.9	2,333	41.7
September	40,053	1,335	2,031	30.9	2,333	57.2
October	28,397	916	2,075	27.3	2,333	39.3
November	26,820	894	2,075	26.9	2,333	38.3
December	30,041	969	2,075	27.4	2,333	41.5
Total	419,246				AVERAGE %	49.2

R-Well						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	34,961	1,128	2,238	34.5	3,162	35.7
February	32,983	1,178	2,604	34.1	3,162	37.3
March	41,401	1,336	2,595	33.9	3,162	42.2
April	58,014	1,934	3,003	36.3	3,162	61.2
May	36,948	1,192	1,902	35.6	3,162	37.7
June	46,429	1,548	2,595	33.4	3,162	48.9
July	51,905	1,674	2,595	34.1	3,162	52.9
August	70,067	2,260	2,601	33.8	3,162	71.5
September	64,985	2,166	2,606	36.9	3,162	68.5
October	28,484	919	1,669	28.5	3,162	29.1
November	34,395	1,146	2,163	29.8	3,162	36.3
December	34,067	1,099	2,163	29.3	3,162	34.8
Total	534,636				AVERAGE %	46.3

M Well						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	31,275	1,009	2,148	35.5	3,927	25.7
February	19,303	623	1,813	50.0	3,927	17.6
March	25,380	819	1,896	50.0	3,927	20.8
April	22,697	732	1,924	50.0	3,927	19.3
May	24,404	787	1,970	50.0	3,927	20.0
June	22,413	723	2,116	35.6	3,927	19.0
July	19,448	627	2,044	44.6	3,927	16.0
August	17,933	578	1,973	50.0	3,927	14.7
September	22,418	723	1,895	50.0	3,927	19.0
October	17,564	567	1,917	30.7	3,927	14.4
November	26,680	861	1,994	50.0	3,927	22.6
December	31,278	1,009	2,122	30.3	3,927	25.7
Total	280,793				AVERAGE %	19.6

J Well						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	25,973	838	1,788	30.4	3,273	26
February	20,041	646	1,893	30.4	3,273	21.9
March	28,884	932	1,943	37.0	3,273	28.5
April	24,019	775	1,954	50.0	3,273	24.5
May	16,937	546	2,091	32.0	3,273	16.7
June	19,158	618	2,232	31.0	3,273	19.5
July	32,899	1,061	2,046	31.3	3,273	32.4
August	26,529	856	1,936	30.9	3,273	26.1
September	122	4	63	27.3	3,273	0.1
October	19,712	636	1,971	30.4	3,273	19.4
November	19,942	643	2,006	30.4	3,273	20.3
December	30,587	987	2,144	30.7	3,273	30.1
Total	264,804				AVERAGE %	21.7

Falconbridge Drinking Water System - 240000020

The Falconbridge well system consists of 3 drilled wells:

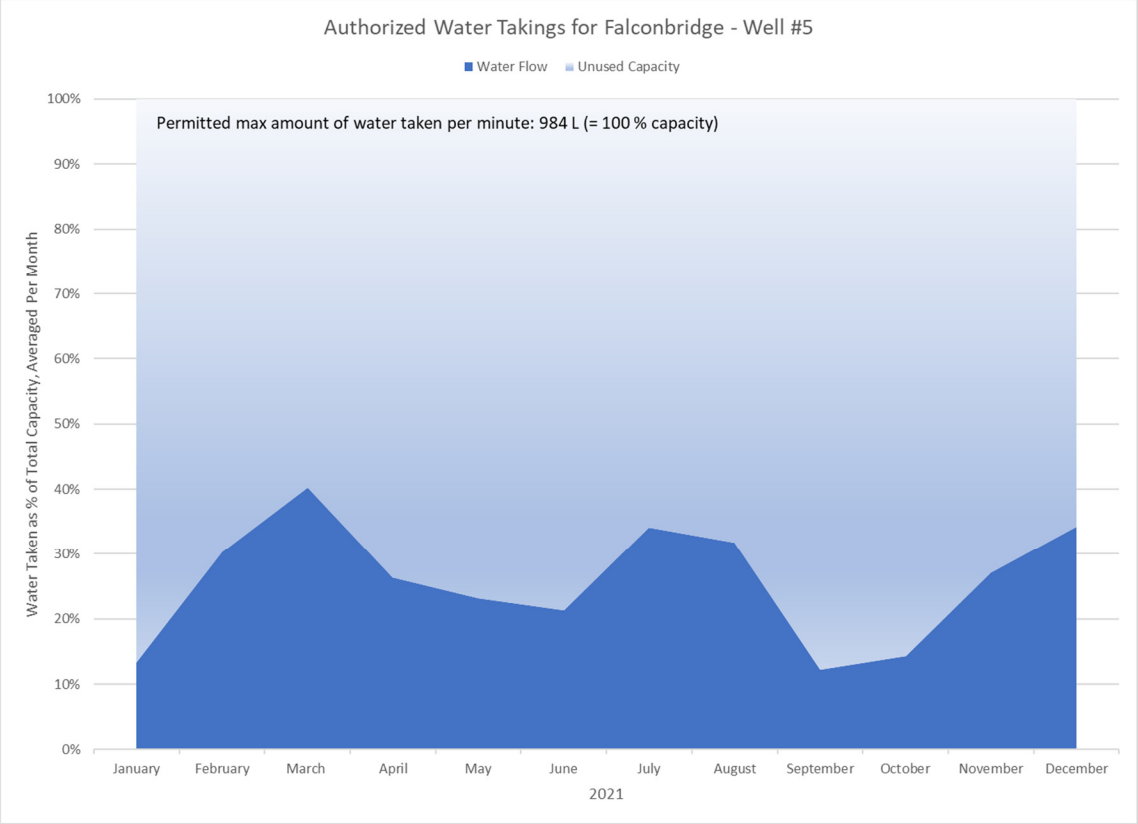
- Well 5,
- Well 6, and
- Well 7.

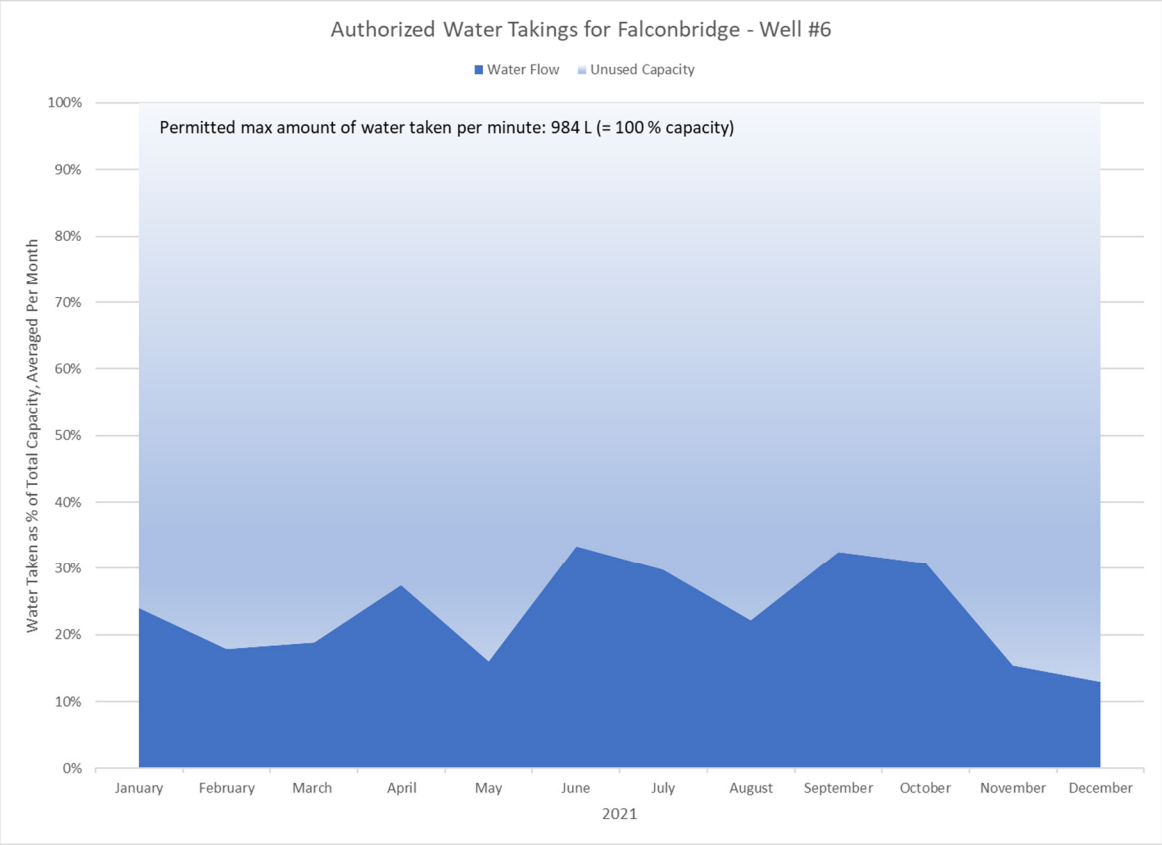
The treatment process follows these steps:

The system includes three submersible pumps, disinfection with chlorine gas, along with polyphosphate addition for corrosion control. The wells are located north of the Sudbury Airport. Water is supplied south to the town of Falconbridge, north to the Greater Sudbury Airport reservoir and to the Nickel Rim Mine tank. The City sells water to Glencore and two industrial clients along the south transmission line and fluoridates the water, as mandated by PHSD, before it enters the Falconbridge municipal distribution system.

Non-Compliance with Act, Regulations, Order or Approvals

The Falconbridge system had no AWQIs in 2021.




Authorized Water Takings for Falconbridge - Well #6
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 984 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
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October
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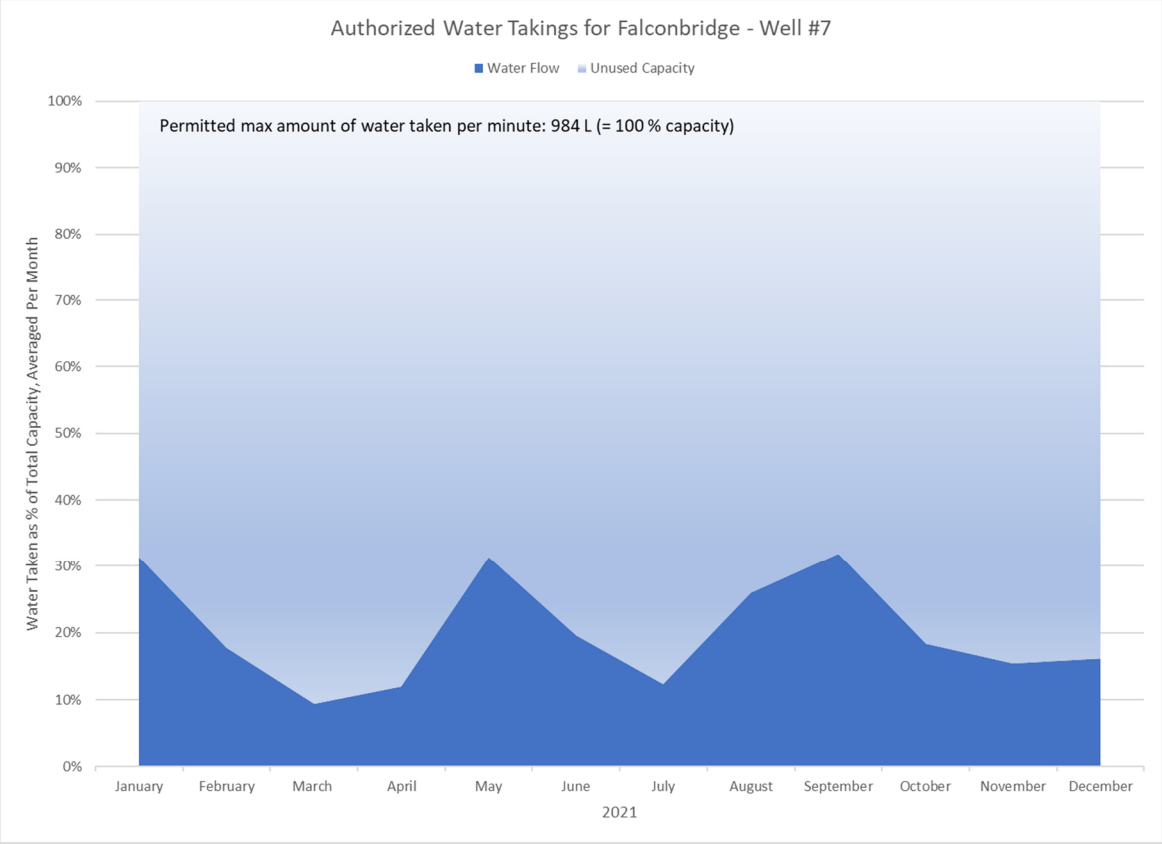
December
2021


Authorized Water Takings for Falconbridge - Well #7
Water Flow
Unused Capacity
Permitted max amount of water taken per minute: 984 L (= 100 % capacity)
Water Taken as % of Total Capacity, Averaged Per Month
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
2021

Annual Flow Summary

Falconbridge Well #5						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	5,864	189	1,044	15.4	1,417	13.3
February	12,034	388	1,106	15.3	1,417	30.3
March	17,673	570	1,103	15.6	1,417	40.2
April	11,204	361	1,056	15.7	1,417	26.4
May	10,152	327	1,185	15.5	1,417	23.1
June	9,090	293	1,115	15.6	1,417	21.4
July	14,968	483	1,215	15.6	1,417	34.1
August	13,956	450	1,191	15.5	1,417	31.8
September	5,195	168	1,091	15.7	1,417	12.2
October	6,294	203	1,266	15.5	1,417	14.3
November	11,523	372	1,008	15.6	1,417	27.1
December	15,028	485	1,125	15.6	1,417	34.2
Total	132,980				AVERAGE %	25.7

Falconbridge Well #6						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	10,552	340	1,071	16.2	1,417	24.0
February	7,077	228	1,086	16.3	1,417	17.8
March	8,306	268	1,140	16.2	1,417	18.9
April	11,662	376	1,120	16.3	1,417	27.4
May	7,069	228	1,174	15.9	1,417	16.1
June	14,164	457	1,271	16.2	1,417	33.3
July	13,086	422	1,227	16.3	1,417	29.8
August	9,719	314	1,196	16.1	1,417	22.1
September	13,819	446	1,183	16.2	1,417	32.5
October	13,552	437	1,089	16.4	1,417	30.8
November	6,557	212	871	16.4	1,417	15.4
December	5,685	183	1,011	16.4	1,417	12.9
Total	121,247				AVERAGE %	23.4

Falconbridge Well #7						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	13,779	444	1,202	16.3	1,417	31.4
February	7,024	227	988	16.2	1,417	17.7
March	4,115	133	1,051	16.2	1,417	9.4
April	5,075	164	1,054	16.1	1,417	11.9
May	13,804	445	1,183	16.4	1,417	31.4
June	8,324	269	1,231	16.2	1,417	19.6
July	5,400	174	1,162	16.3	1,417	12.3
August	11,437	369	1,264	16.6	1,417	26.0
September	13,563	438	1,261	16.8	1,417	31.9
October	8,088	261	1,065	16.5	1,417	18.4
November	6,549	211	988	16.3	1,417	15.4
December	7,096	229	1,062	16.3	1,417	16.2
Total	104,254				AVERAGE %	20.2

Onaping/Levack Drinking Water System - 220003519

The Onaping/Levack system includes three drilled wells:

- Well 3;
- Well 4, and;
- Well 5.

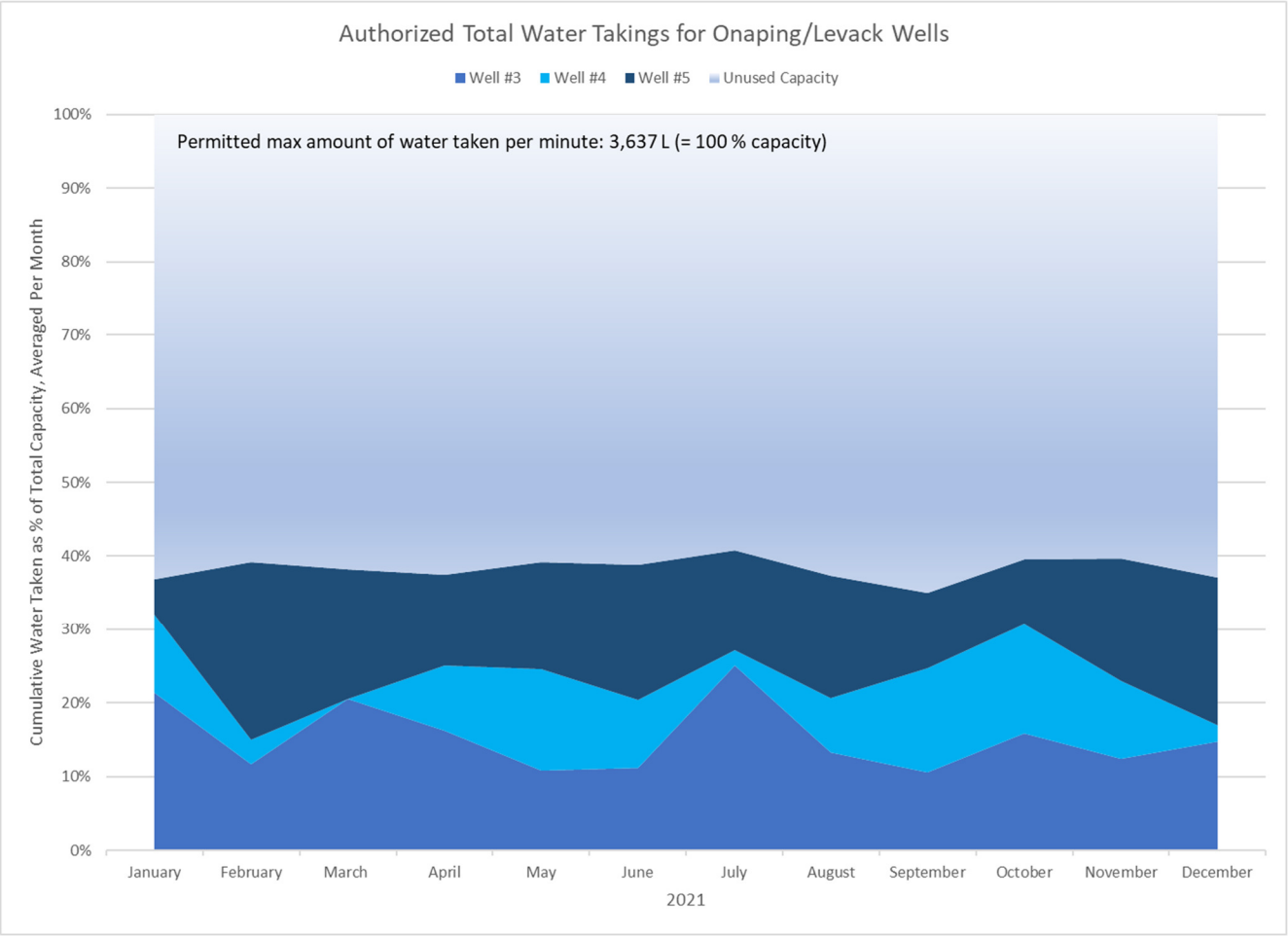
The treatment process follows these steps:

The system includes three pumps, disinfection with chlorine gas, sodium hydroxide (caustic) for pH adjustment, polyphosphate addition for corrosion control along with fluoride injection. An elevated storage tank with re-chlorination capabilities, a pressure control/booster building with stand-by power, a pressure control facility on Fraser Crescent and the distribution piping complete the system. The City continues to monitor sodium on a monthly basis on the raw water due to high levels present in the aquifer caused by road salt as a major highway is above grade.

Non-Compliance with Act, Regulations, Order or Approvals

The Onaping/Levack system had 2 AWQIs in 2021. Both were related to chlorine analyzer failures. For the first incident, the sample pump stopped working during routine maintenance. It was replaced and analyzer put back into service. For the second incident, a power outage caused a loss of communications to the

analyzer. The on-call operator arrived a little after the one-hour window to sample manually. The operator continued sampling manually until communications between the analyzer and SCADA were restored.



The Onaping/Levack PTTW is different from the other systems in that its total taking is not a sum of all sources, but rather the same value as any one well. For that reason, this system requires superimposing all three wells onto one chart to ensure the sum does not exceed the permit.

Annual Flow Summary

Onaping Well #3						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	34,669	1,118	2,250	37.9	5,237	21.4
February	17,097	552	2,128	35.1	5,237	11.7
March	33,317	1,075	2,244	34.9	5,237	20.5
April	25,573	825	2,232	35.2	5,237	16.3
May	17,633	569	2,122	35.1	5,237	10.9
June	17,612	568	2,496	35.1	5,237	11.2
July	40,655	1,311	2,629	35.8	5,237	25.0
August	21,637	698	2,577	35.3	5,237	13.3
September	16,613	536	2,009	34.7	5,237	10.6
October	25,666	828	2,526	35.3	5,237	15.8
November	19,486	629	2,236	34.5	5,237	12.4
December	23,856	770	2,184	34.7	5,237	14.7
Total	293,814				AVERAGE %	15.4

Onaping Well #4						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	17,325	559	1,955	30.9	5,237	10.7
February	4,955	160	2,045	30.0	5,237	3.4
March	0	0	0	0.0	5,237	0.0
April	13,746	443	2,207	51.8	5,237	8.7
May	22,320	720	2,281	29.7	5,237	13.7
June	14,416	465	2,404	29.5	5,237	9.2
July	3,440	111	1,260	29.7	5,237	2.1
August	11,927	385	2,247	29.8	5,237	7.3
September	22,272	718	2,266	29.7	5,237	14.2
October	24,173	780	2,297	29.7	5,237	14.9
November	16,531	533	2,346	29.5	5,237	10.5
December	3,724	120	1,711	29.3	5,237	2.3
Total	154,830				AVERAGE %	8.1

Onaping Well #5						
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,795	251	1,941	37.1	5,237	4.8
February	35,423	1,143	2,347	40.4	5,237	24.2
March	28,704	926	2,175	37.4	5,237	17.7
April	19,509	629	2,433	45.1	5,237	12.4
May	23,615	762	2,460	44.7	5,237	14.5
June	28,977	935	2,345	43.6	5,237	18.4
July	22,052	711	2,987	43.8	5,237	13.6
August	27,109	874	2,408	50.4	5,237	16.7
September	16,129	520	2,353	47.2	5,237	10.3
October	14,351	463	3,061	44.2	5,237	8.8
November	26,264	847	2,438	43.0	5,237	16.7
December	32,686	1,054	2,196	44.9	5,237	20.1
Total	282,614				AVERAGE %	14.8

Onaping Wells Total				
	Total Flow m^3	Maximum Daily Flow m^3/d	MDWL Maximum Flow m^3/d	% Capacity
January	59,789	2,250	5,237	36.8
February	57,475	2,566	5,237	39.2
March	62,021	2,290	5,237	38.2
April	58,828	2,433	5,237	37.4
May	63,568	2,476	5,237	39.2
June	61,005	2,496	5,237	38.8
July	66,147	2,987	5,237	40.7
August	60,673	2,577	5,237	37.4
September	55,014	2,353	5,237	35.0
October	64,190	3,061	5,237	39.5
November	62,281	2,438	5,237	39.6
December	60,266	2,196	5,237	37.1
Total	731,258		AVERAGE %	38.3

Vermilion Distribution System - 260006789

The Vermilion distribution system is a standalone distribution system that receives water from a "donor" system, as CGS purchases water from Vale, the owner of the Vermilion water treatment facility. Vale has responsibility for the treatment facility and must also comply with O. Reg. 170/03. The Vale water treatment facility is not the subject of this report.

CGS owns and operates the distribution network in the communities of Copper Cliff, Lively, Naughton, Whitefish and Atikameksheng Anishnawbek. The system also includes the Walden Water Storage Tank and Walden Metering Chamber.

Water quality throughout the distribution systems is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

The Vermilion system had 4 AWQIs for 2021. The first incident was a low chlorine residual reading caused by a failing analyzer. The chlorine residual was re-checked with a different instrument, and the analyzer was repaired. The second incident was a communication failure with the chlorine analyzer. The on-call operator did not arrive within the one-hour window of losing the signal to sample manually. The operator remained onsite to manually test the free chlorine residual until communications were restored. The last two incidents are for the running annual averages (RAAs) of halo acetic acids (HAAs) being above the standard of 80 µg/L: 3rd and 4th quarter results are, respectively, 81.12 µg/L and 82.04 µg/L. The corrective action is to monitor. Vale and CGS have formed a working group to reduce this parameter in 2022.