WATER
RIVERVIEW PARK AND ZOO

Annual Drinking Water Report 2022

Inside this Report

2022 Peterborough Utilities Commission

Mayor Diane Therrien..... Chair

Councillor Don Vassiliadis..... Vice-Chair

Councillor Gary Baldwin..... Commissioner

Councillor Dean Pappas..... Commissioner

Councillor Stephen Wright..... Commissioner

2022 Riverview Park and Zoo Advisory Committee

Name of Volunteer	Date Appointed
Wally Davidson	Lifetime Member
Janet Lafortune	January 2018
Paul Hartung	January 2018
Shauna Moodie	January 2021
Susan Ramey	January 2021

On the Cover

Riverview Park and Zoo's Domestic Yaks form a small herd with six of these mammals now in our Zoo. We have one male yak, Yeti, and five females, Midnight, Shadow, Sasquatch, Avalanche and Yuki. Both male and female yaks have horns, however males can be differentiated by the more outward curved shape. These large animals, weighing up to 1000 kg, are often spotted grazing in the morning and sleeping in the afternoons. Yaks live in the highest elevation of any mammal's habitat, up to 6-kilometers altitude, feeding on shrubs, mosses, and grasses. At the Park and Zoo their diet consists of apples, carrots, alfalfa, and the leaves of various vegetation.

Questions or comments

Please contact us either by mail, phone or email.

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Introduction

All Peterborough Utilities Commission facilities are managed and operated under contract by PUG Services Corp. (PUGSC). The Water Utility section of PUGSC includes the following operating departments:

- Water Treatment Plant
- Water Distribution
- Water Engineering Services
- Riverview Park and Zoo

Financial Summary

The audited financial statements for 2022 are included as Appendix A. Further details can be found in CFO's report 2.03, presented to The Commission in April 2023.

Drinking Water Process Description

Source Water

The source of raw (untreated) water for Peterborough's drinking water is the Otonabee River. The Otonabee River water is of good quality and can be described as a moderately coloured water of low turbidity. The river water temperature ranges from 0°C (winter) to approximately 26°C (summer). The raw river water is what we call a surface water supply, which means that it is considered to be an unprotected source.

Accordingly, we assume that raw water always requires full treatment at the Peterborough Water Treatment Plant to make it drinkable or potable.

The river water quality is monitored by staff at the plant as well as the Otonabee Region Conservation Authority (ORCA) and the Peterborough Health Unit (beaches only). The watershed is protected by planning and approvals processes through the City of Peterborough and ORCA. Since 1998, ORCA has monitored water quality in the Otonabee watershed under the Watershed 2000 Program and the Provincial Water Quality Monitoring Network.

Peterborough Utilities continued its participation in the Source Water Protection Committee in 2022.

Treatment Plant Operations

The plant is located at 1230 Water Street North, Peterborough, adjacent to the Riverview Park & Zoo. The plant was initially built in 1922 and expanded in 1952, 1965, 1995 and 2016. The conventional treatment process includes coagulation, flocculation, sedimentation, filtration and chlorine disinfection and a process waste treatment facility to dewater the backwash sludge.

Total raw water processed in 2022 was 11,138.41 megalitres (ML), this is an average of 30.52 ML daily (Table 1). The maximum daily pumpage of 37.40 ML, occurred on July 15th, was a 1.5% increase from the maximum daily value (30.96 ML) recorded on Aug 21st, 2021.

Table 1

Water Treatment Plant Operations	2021	2022
Total Annual Raw Water	11,301.84	11,138.41
Average Day ML	30.96	30.52
Total Annual Treated Water	9,916.06	10,117.70
Average Day Consumption ML	27.29	27.70
Max. Daily Pumpage	37.49 – Aug 25	37.69 – Aug 7
Max. Daily City Consumption	36.87 – July 7	37.46 – July 15
Peak Hourly Consumption Rate	70.69 – Dec 15 @20:00h	65.82 – Sept 10 @12:30h
Total Wash Water	261.73	199.50
Average of Plant Effluent	2.6%	2.0%
Total Zone #1 Pumpage	5,997.14	6,207.44
Average Day	16.47	17.00
Total Zone #2 Pumpage	3,918.91	3,910.26
Average Day	10.76	10.70

Reservoirs, Elevated Tanks, Water Booster Pumping Stations

Treated water is stored at various locations throughout the City in underground reservoirs and elevated storage tanks. Storage is used to supplement supply during times of high water demand and in emergency situations such as firefighting. The water storage capacity in the system is 55.36 ML, including the Water Treatment Plant. Water storage around the city is as follows:

Water Treatment Plant	8.5 ML
High Street Elevated Tank	4.55 ML
Clonsilla Avenue Reservoir	18.18 ML
Towerhill Reservoir	22.73 ML
Sherbrooke Elevated Tank	2.3 ML
Milroy Elevated Tank	0.5 ML

Water Distribution

The water distribution system consists of approximately 470 kilometres of pipe (water mains), 2,394 hydrants and 27,722 individual water services. Hydrants are colour-coded according to the Ontario Fire Code requirements to indicate the available flow rate at a 20 psi residual pressure.

PTBO H_20

The Utilities' mobile drinking water station, named PTBO H_20 operated from May – October in 2022 This year PTBO H_20 participated in municipally sponsored events, concerts, sporting events and local festivals.

The mobile drinking water station stations was created to provide fresh clean tap water to event patrons. Visitors to the mobile station can us a fountain to have a drink or to refill water bottle while staff promotes our tap water and other conservation activities. The mobile unit compliments our corporate values on the Environment, with the promotion of resource conservation.

Capital Works Summary

The Water Treatment Plant underwent the following upgrades in 2022

- Raw water ozone feed system preliminary design.
- Replaced five of the fifteen HACH turbidity meters with Swan turbidity meters in the WTP.
- Two intrinsically safe heaters replaced in the Sodium Hydroxide/Fluoride Storage tank areas.
- TSSA upgrades were completed to the diesel engine driven pumps/generators at the WTP and Pumping Stations.

Water Main Replacement

Approximately 350 m of distribution water mains were replaced on:

- Goodfellow Road

New Water Main Installation

Approximately 1400 m of water main was installed on Bethune Street as part of the City's Jackson Creek Flood Diversion project.

Water Service Replacement

A total of 69 water services were replaced in 2022.

Water Distribution Upgrades

Three permanent flushing station were installed to assist operators to monitor water quality throughout the distribution system. A Pressure Reducing Valve (PRV) chamber was installed top provide a redundant water feed to a larger isolated water system , this also improved fire protection flows in the area.

Summary of Inspection & Compliance

Ministry of Environment Conservation & Parks Inspection

During 2022, there was a Ministry of the Environment, Conservation & Parks (MECP) Inspection on July 17, 2022, report #1-29669702. The Peterborough Drinking Water System received a 100% compliance rating. There were no recommended best practices noted in the report.

Adverse Water Quality Incidents

There was a single incident in 2022 of an adverse water quality result. This occurred on July 11, 2022, with an exceedance of total coliform at the Lansdowne Pumping station. The location was resampled as per protocol and test results were negative for total coliform.

Drinking Water Quality Management System

On October 30, 2006, the finalized standard was issued on the Environmental Bill of Rights Registry. The purpose of this Standard is to assist owners and operating authorities in the effective management and operation of their municipal residential drinking water systems.

This Standard outlines requirements for a Quality Management System (QMS) to ensure high quality drinking water. In the development of a QMS, the Operating Authority must create an Operational Plan; this document will define the QMS and will be subject to external audits for accreditation. Staff developed and implemented a QMS specific to the Peterborough municipal water system, which received full scope accreditation in June 2011.

The Peterborough Drinking Water System maintained accreditation to the Drinking Water Quality Management Standard (DWQMS). In advance of the annual verification audit an internal audit was conducted in September 2022. The internal audit found eight opportunities for improvement and no corrective actions required. The external audit, conducted by NSF International, later in October 2022 described that the management system was well documented and continues to be effective.

Water Flows

Permit to Take Water

The *Ontario Water Resources Act, Regulation 387/05* authorized Peterborough Utilities Commission in accordance with Permit to Take Water, 5167-9BVR6A the withdrawal of 190.68 ML per day. Under this Regulation we are required to report the daily water taking annually by March 31st each year.

In 2022, there were no instances of water taking in excess of this daily limit. The total volume of water pumped into

the Water Treatment Plant was 11,138.41 megalitres (ML), this is an average of 30.52 ML daily.

Treated Water Production

The Water Treatment Plant produced 10,117.70 megalitres (ML) in 2022, this is an average of 27.70 ML daily (Chart 1). Historically the highest water consumption recorded was in 1980 (18,621.20 ML).

Peterborough Utilities meters water usage and the majority of water usage in 2022 was by industrial, institutional and large commercial users. There was a certain amount of water used for distribution system maintenance in order to maintain the water quality in the distribution system.

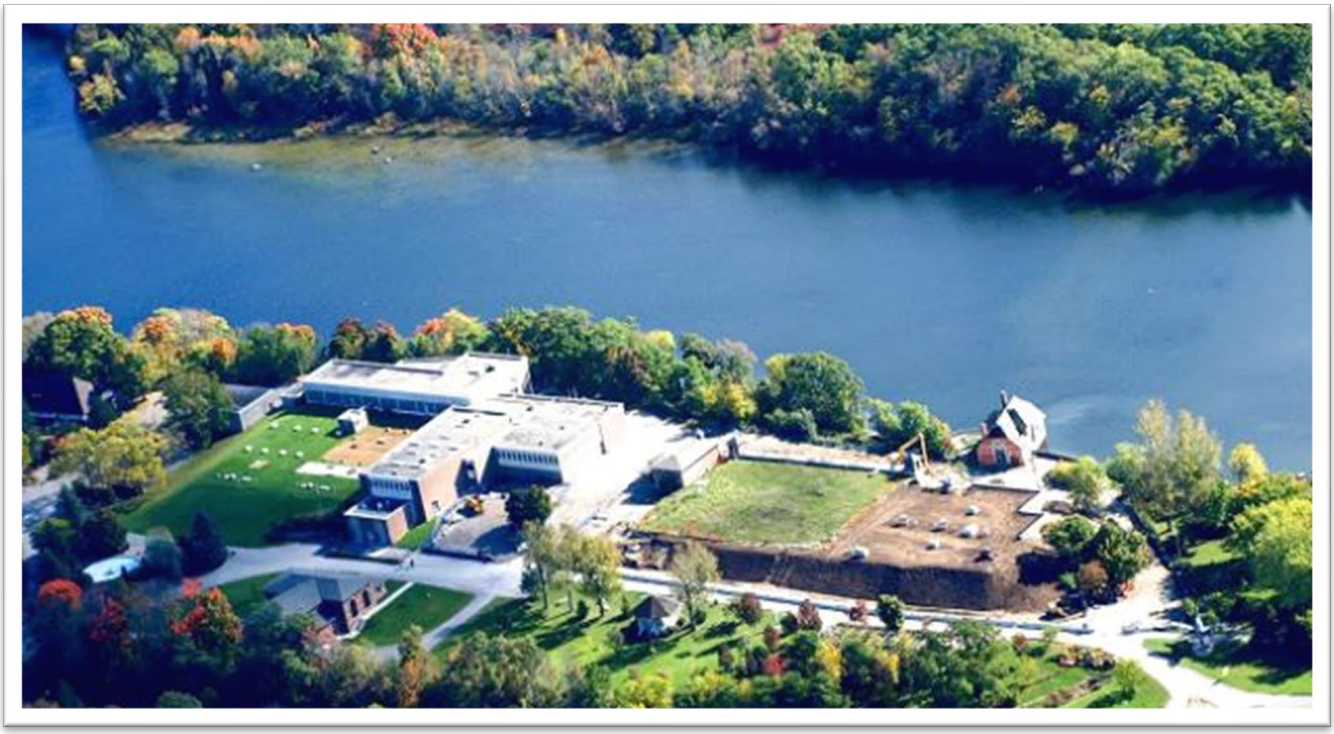
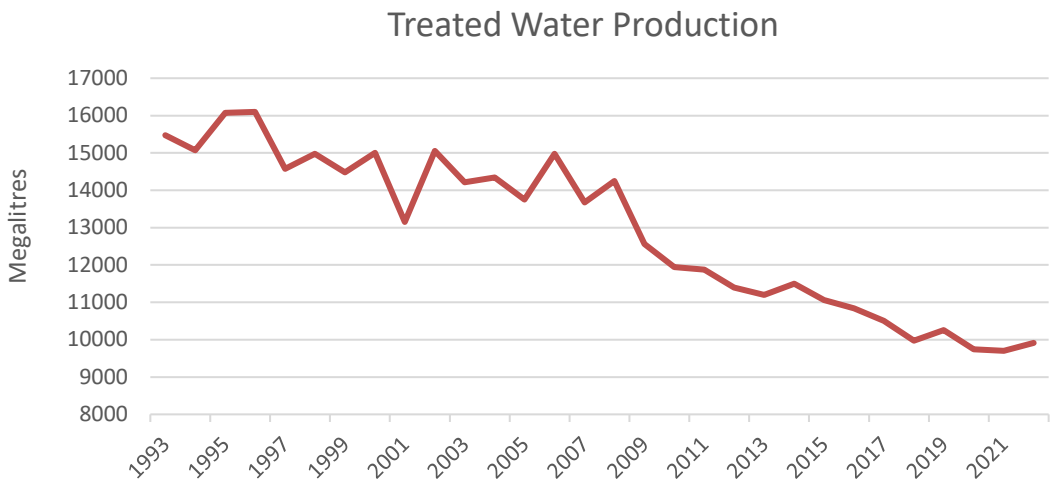
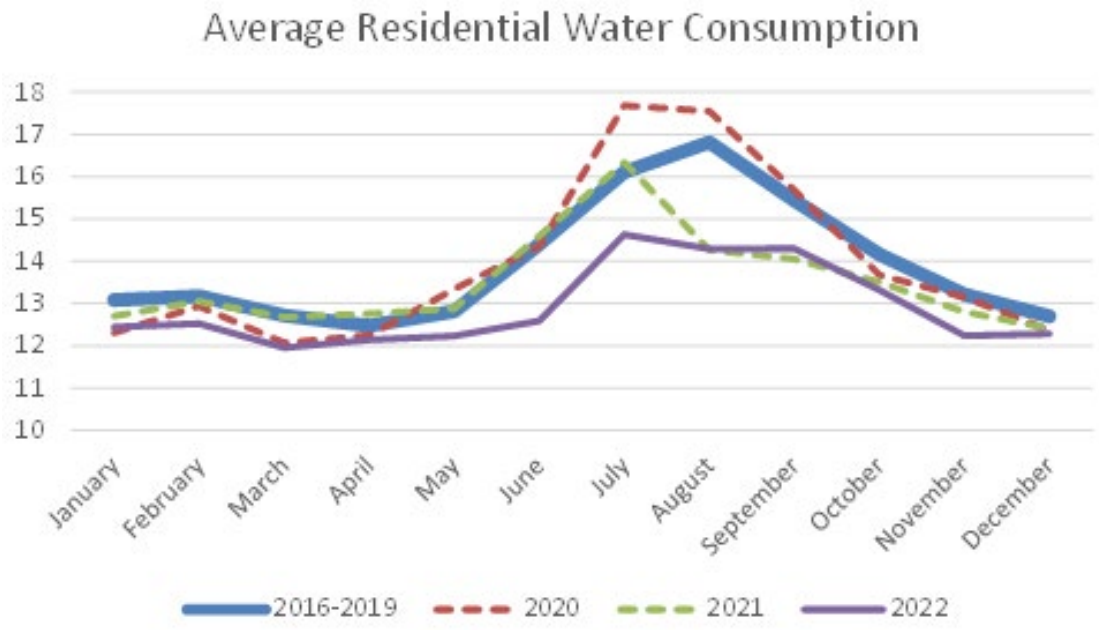


Chart 1



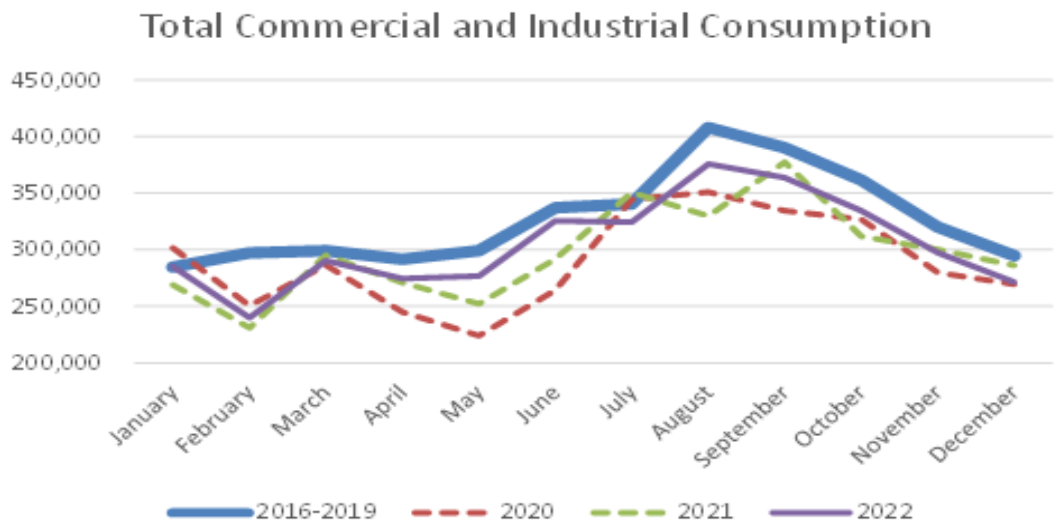
2022 water production was 10,117.70 ML

Chart 2



The residential water consumption pattern is driven by annual weather patterns, as shown in Chart 2.

Chart 3



The industrial water consumption typically peaks annually in the third quarter as shown in Chart 3. However, numbers are still below the pre-pandemic historical trend (2016-2019).

Water Quality Results

Continuous monitoring of turbidity, chlorine, fluoride and pH levels at the Water Treatment Plant, thousands of water samples are taken each year for chemical, physical and microbiological tests. These tests are carried out on water samples before and after treatment as well as on samples collected from different points in the water distribution system.

A total of approximately 20,000 individual tests were performed on Water Treatment Plant and water distribution samples in 2022. Approximately 13,000 individual tests were performed in the Water Treatment Plant Laboratory and approximately 6,000 microbiological and chemical tests were performed by Peterborough Environmental Protection Laboratory and SGS Lakefield Research Limited.

Results of the laboratory testing continue to confirm that the Peterborough Water

Treatment Plant produces good quality water and this quality is maintained throughout the water distribution system to the customer's tap.

O. Reg. 169/03 contains the *Ontario Drinking Water Quality Standards* (ODWQS). The purpose of the

Province's ODWQS is to establish parameter limits to protect public health. An exceedance of any parameter would result in an adverse water quality event with notification to the Medical Officer of Health and the MECP. Appropriate corrective action would have to be initiated to address the adverse incident.

Chlorine Residual

The Peterborough Water Treatment Plant uses chlorine for disinfection against viruses and bacteria in accordance with O. Reg. 170/03. Sample results reported under Schedule 7 for plant effluent was 0.91 -2.31 mg/L.

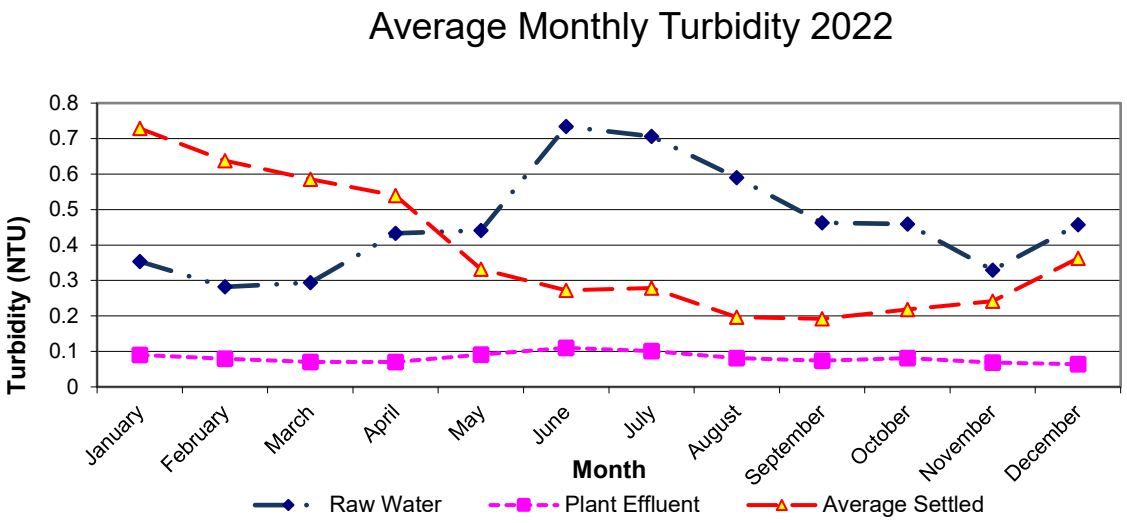
Turbidity

The average raw water turbidity in 2022 was 0.46 NTU; average during 2021 was 0.55 NTU. The monthly raw water turbidity peak occurred in June at 0.73 NTU as shown in Chart 4, the past 20-year average raw water turbidity was 0.57 NTU and treated water turbidity was 0.09 NTU.

The zebra mussel population in the river could also be a contributing factor for the cyclical increases and decreases in raw water turbidity. Raw water turbidity has slowly dropped since 2008.

The performance criteria for filtered water is 0.30 NTU for 95% of the time, without exceeding 1.0 NTU. The average filtered water turbidity was 0.05 NTU for 2022 and in 2021 was 0.04 NTU. Filters are taken off-line when the turbidity reaches 0.15 NTU. The 2022 average treated water turbidity was measured at 0.08 NTU.

Chart 4



Microbiological Standards Testing

Escherichia coli

During 2022, a total of 247 Escherichia coli (E.coli) samples were analyzed from the Otonabee River (at the WTP intake) to assist in determining the source of fecal contamination within our source water. Monthly values ranged from 0 to 200 Colony Forming Units (CFU) per liter. A total of 1,224 E.coli samples were analyzed from the plant effluent and distribution system. All values in the treated drinking water samples were zero.

Total Coliform

The MECP guidelines for Total Coliform are to have all samples collected from the plant effluent to be zero CFU per litre of water sampled. During 2022, a total of 247samples were analyzed from the Otonabee River. Monthly values ranged from 0 to 800 Colony Forming Units (CFU) per liter. A total of 1,224 Total Coliforms samples were analyzed from the plant effluent and distribution system.

Inorganic Parameters

No known health-related water quality guidelines for inorganic (Table 2) and organic (Table 3) parameters were exceeded in 2022 in Peterborough's drinking water. In order to ensure that Peterborough's water is safe to drink, water quality is carefully monitored and subject to constant surveillance.

Table 2

Schedule 23	Unit	2022 Results	MAC
Antimony	mg/L	<0.00009	0.006
Arsenic	mg/L	<0.00002	0.025
Barium	mg/L	0.0258	1.0
Boron	mg/L	0.007	5.0
Cadmium	mg/L	0.000003	0.005
Chromium	mg/L	0.00008	0.05
Mercury	mg/L	<0.00001	0.001
Selenium	mg/L	0.00007	0.01
Uranium	mg/L	0.00017	0.02

Organic Parameters

Table 3

Schedule 24	Unit	2022 Results	MAC
Alachlor	mg/L	<0.00002	0.005
Atrazine + N-dealkylated metabolites	mg/L	<0.00001	0.005
Azinphos-methyl	mg/L	<0.00005	0.02
Benzene	mg/L	<0.00032	0.005
Benzo(a)pyrene	mg/L	<0.000004	0.00001
Bromoxynil	mg/L	<0.00033	0.005
Carbaryl	mg/L	<0.00005	0.09
Carbofuran	mg/L	<0.00001	0.09
Carbon Tetrachloride	mg/L	<0.00016	0.005
Chlorpyrifos	mg/L	<0.00002	0.09
Diazinon	mg/L	<0.00002	0.02
Dicamba	mg/L	<0.0002	0.12
1,2-Dichlorobenzene	mg/L	<0.00041	0.2
1,4-Dichlorobenzene	mg/L	<0.00036	0.005
1,2-Dichloroethane	mg/L	<0.00035	0.005
Dichloromethane	mg/L	<0.00035	0.05
2,4-Dichlorophenol	mg/L	<0.00015	0.9
2,4-Dichlorophenoxy acetic acid (2,4-D)	mg/L	<0.00019	0.1
Diclofop-methyl	mg/L	<0.0004	0.009
Dimethoate	mg/L	<0.00006	0.02
Diquat	mg/L	<0.001	0.07
Diuron	mg/L	<0.00003	0.15
Glyphosate	mg/L	<0.001	1
Haloacetic acids (HAA)	mg/l	0.0750	0.08
Malathion	mg/L	<0.00002	0.19
2-Methyl-4-chlorophenoxyacetic acid	mg/L	<0.0000012	0.00012
Metolachlor	mg/L	<0.00001	0.05
Metribuzin	mg/L	<0.00002	0.08
Monochlorobenzene	mg/L	<0.0003	0.08
Paraquat	mg/L	<0.001	0.01
Pentachlorophenol	mg/L	<0.00015	0.06
Phorate	mg/L	<0.00001	0.002
Picloram	mg/L	<0.001	0.19
Polychlorinated Biphenyls (PCB)	mg/L	<0.00004	0.003
Prometryne	mg/L	<0.00003	0.001
Simazine	mg/L	<0.00001	0.01

Schedule 24	Unit	2022 Results	MAC
Terbufos	mg/L	<0.00001	0.001
Tetrachloroethylene (perchloroethylene)	mg/L	<0.00035	0.03
2,3,4,6-Tetrachlorophenol	mg/L	<0.0002	0.1
Triallate	mg/L	<0.0001	0.23
Trichloroethylene	mg/L	<0.00044	0.005
2,4,6-Trichlorophenol	mg/L	<0.00025	0.005
Trifluralin	mg/L	<0.00002	0.045
Vinyl Chloride	mg/L	<0.00017	0.002

Trihalomethanes -THM

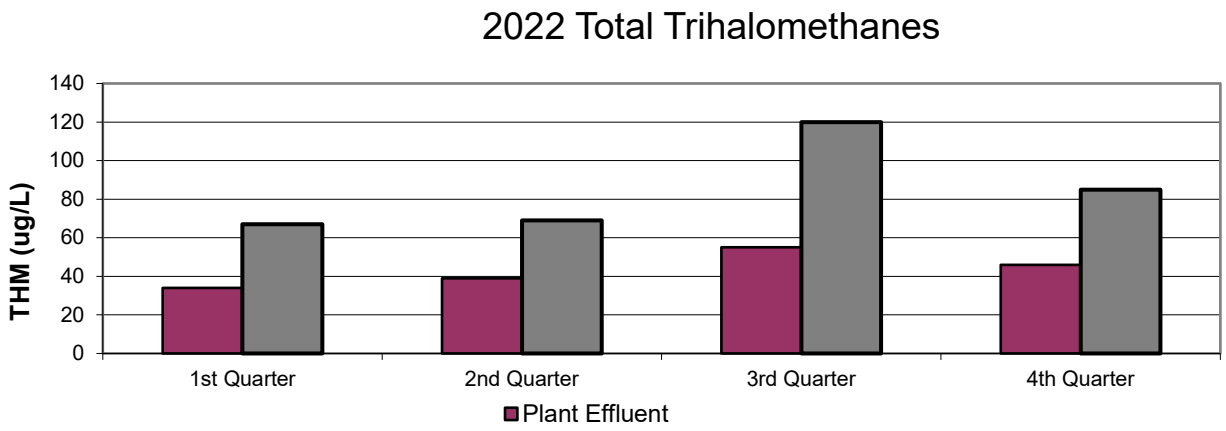
In Ontario, the Ministry of the Environment Conservation & Parks' Maximum Acceptable Concentrations (MAC) for total THM's (total concentration of chloroform, bromoform, bromodichloromethane and dibromochloromethane) are set to 100 μg/L (running annual average) for the distribution system. According to O. Reg. 170/03, distribution THM samples must be collected and analyzed quarterly.

Trihalomethanes (THM's) are formed as a by-product when chlorine is used to disinfect water for drinking. The presence of organic materials along with the use of chlorine in the water treatment process can contribute to the formation of disinfection by-products. The THM's may have adverse health effects at high concentrations and many governments set limits on the amount permissible in drinking water.

The THM average values found leaving the Water Treatment Plant during 2022 was 43.50 μg/L. The past 10-year average plant effluent has been 41 μg/L.

Distribution levels are always found to be higher than those leaving the Water Treatment Plant since THM's continue to form as the water travels through the distribution piping system. During 2022, one distribution location was selected to assist in determining areas of the city where THM's may be highest. The annual average THM value in the distribution system was 85 μg/L (Chart 5). The average THM value during 2021 was 74 μg/L. The 10-year average of distribution THM concentration was found to be 76 μg/L.

Chart 5



Haloacetic Acid

HAA's are another group of chemicals that are formed as disinfection by-products similar to trihalomethanes (THM).

The 2022 average treated water HAA was 40.2 μg/L and the average distribution sample was found to be 58 μg/L. O Reg. 170/03 was amended to include HAAs in 2021. The regulatory limit for distribution samples are 80 μg/L (running annual average); therefore, the Peterborough Drinking Water System maintained compliance.

Sodium

Sodium is not part of Schedule 23 or 24 but is required to be tested at least once every five (5) years. It has been sampled every year and was found to be below the ODWS aesthetic objective of 200 mg/L. In 2022, the sodium result was found to be 9.3 mg/L (7.3 mg/L in 2021). The local Medical Officer of Health must be notified when the sodium concentration exceeds 20 mg/L so that this information may be passed on to local physicians.

Lead

Lead sampling is required under O. Reg. 170/03, schedule 15.1. Peterborough requires 8 distribution samples to be collected and analyzed for lead, pH and alkalinity every sampling period. Peterborough is required to sample any residential house in the city that requests sampling for the same parameters mentioned above.

In 2022, we sampled 0 private plumbing (residential) and 18 distribution points for lead. Customers are offered free testing of their private dwelling. The distribution samples results were less than 0.0005 to 0.0007 mg/L which indicates that the distribution system does not contribute to lead contamination.

Taste and Odour

During 2022, the primary source of taste and odour in our raw water was from the naturally occurring compounds geosmin (name derived from the Greek 'earth' and 'smell') and 2-MIB (2-methylisoborneol). These compounds are monitored as a precursor to taste and odour complaints (earthy/musty) of the water and are not a health concern. They can be detected by humans at very low levels (less than 10 ηg/L). The bacteria actinomycetes, zebra mussels and some species of algae can produce geosmin and 2-MIB, though all of the contributing organisms are not known. Observations have shown that when we have greater zebra mussel and/or algae populations we experience higher amounts of geosmin and 2-MIB.

Previous annual data indicates that geosmin and 2-MIB would hit peaks at the same time during the summer months. There is usually a large peak near the end of the summer when the water temperature is highest and sunlight hours are high. The concentration peaks for both taste and odour causing compounds occurred approximately July to November.

Geosmin is thought to originate higher in the water column and produce an earthy odour. The average raw water value during 2022 was 6.0 ηg/L and the average plant treated water was 6.2 ηg/L Chart 6).

The 2-MIB is produced in the sediment or benthic layer and gives off a musty odour. 2-MIB can reproduce well when sunlight can penetrate down to the bottom of lakes and streams. The average raw water value during 2022 was 4 ηg/L and the average plant effluent was 4.1 ηg/L (Chart 7).

The reduction of geosmin and 2-MIB due to water treatment processes (coagulation, sedimentation, filtration and chlorination) was negligible. Both geosmin and 2-MIB compounds resist oxidation (disinfection) and are difficult to remove by conventional water treatment processes.

Chart 6

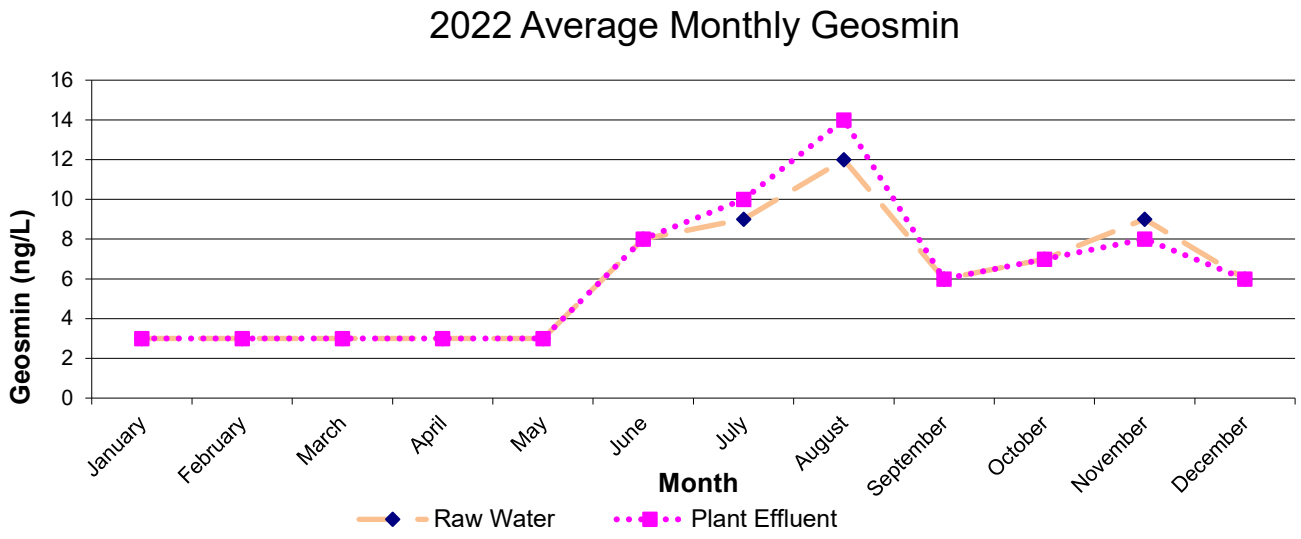
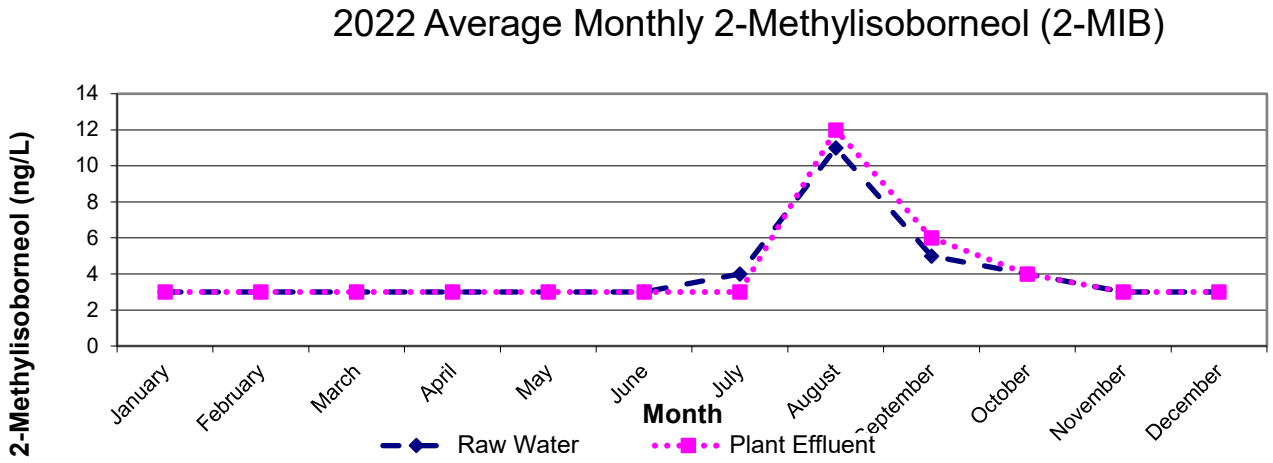


Chart 7



Summary Report

The summary of water delivered as per O. Reg. 170/03 Schedule 22 in 2021 is shown in Table 4.

Table 4

Month	Average Day (M^3/d)	Maximum Day (M^3/d)	Peak Flows (L/m)
January	25,257	31,698	22,013
February	25,689	29,646	20,588
March	25,479	30,333	21,065
April	26,004	27,992	19,439
May	28,645	33,417	23,206
June	30,336	34,371	23,869
July	32,874	36,091	25,063
August	32,299	37,964	26,364
September	29,090	31,645	21,976
October	25,945	28,259	19,624
November	25,444	26,686	18,532
December	25,609	34,186	23,740
Rated Capacity	**104.00**	----	----
Approved Flowrate	----	190.68	132,743 L/m

Chemical Consumption

Table 5

Chemical Use	2021	2022
Total Chlorine	40,474 kg	41,704 kg
Average Dosage	1.27 mg/L	1.31 mg/L
Total Aluminum Sulphate	833,546 L	853,479 L
Average Dosage	48.7 mg/L	49.6 mg/L
Total Hydrofluosilicic Acid	20,812 L	25,845 L
Average Dosage	0.59 mg/L	0.68 mg/L
Total Sodium Hydroxide	70,962	40,962
Average Dosage	3.27 mg/L	4.0 mg/L

Chlorine

The average dose of chlorine for 2022 was 1.31 mg/L (Table 5). This value fluctuates throughout the year as higher doses of primary chlorine are required during the summer months because it takes more chlorine to disinfect the water when the water is warmer.

Chlorine is also added into the treated water before it leaves the WTP. This secondary chlorine is added to help maintain the chlorine residual throughout the distribution system to comply with the Ontario Drinking Water Standards (ODWS).

Zebra mussel control for the Water Treatment Plant included adding approximately 0.5 mg/L of chlorine into the Water Treatment Plant intakes from typically between May to October.

Hydrofluorosilicic Acid (fluoride)

Hydrofluorosilicic acid (fluoride) was added to the treated water to attain a combined concentration (target value) of 0.70 mg/L. Fluoride is added to the water depending on the total concentration required in the treated water and also the concentration of the raw water. The average dosage of fluoride added to the water in 2022 was approximately 0.68 mg/L (Table 5). The average treated water fluoride residual was 0.59 mg/L. The average fluoride concentration found in the raw water (natural fluoride) during 2022 was 0.11 mg/L.

Sodium Hydroxide

Sodium Hydroxide (NaOH) is normally added to the plant effluent for corrosion control within the distribution system as well as plant effluent pH adjustment. The use of chlorine and aluminium sulphate (alum) during the water treatment process lowers the pH level causing the water to be slightly acidic (corrosive). The addition of NaOH increases the pH to a more acceptable value of 7.1.

Aluminium Sulphate

Aluminium Sulphate (alum) is used as our primary coagulant causing particles (silt, sand, algae, and bacteria) to coagulate or 'clump' to form a floc, which can settle in the sedimentation basins. The water is further treated by filtration. Alum was added to the water during 2022 at an average rate of 49.6 mg/L (Table 5). The average alum dosage during 2021 was 48.7 mg/L. Aluminium residual found in the WTP treated water can be a by-product of the addition of alum. The average treated water aluminium residual for 2022 was 0.039 mg/L the operational guideline for aluminium is 0.1 mg/L.

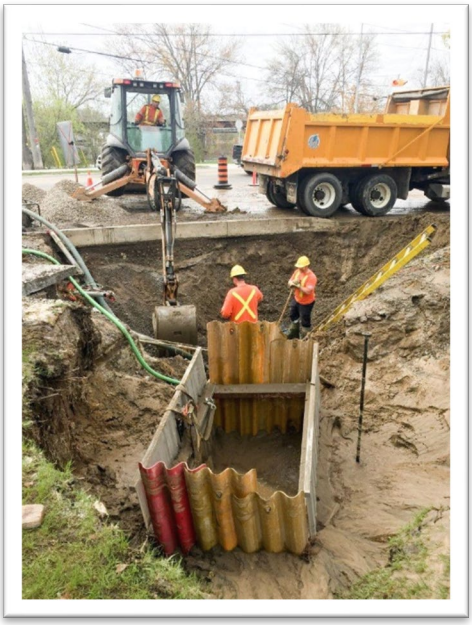
Water Treatment Plant

Annual maintenance was conducted at the Water Treatment Plant, Water Street Pumphouse, reservoirs, elevated tanks and booster pumping stations.

Water Distribution

Annual water distribution review and maintenance programs are necessary to ensure the safe delivery of drinking water in Peterborough. These programs include:

- Valve maintenance
- Hydrant maintenance
- Dead end flushing
- Service post repair



Impact of Climate Events

The temperature during June, July and August averaged approximately 26.2°C. This is above normal summertime temperature. Environment Canada data describes the average normal value of 18.3°C (normal data 1981 – 2010). The summer months in 2022 were hotter than normal with 12 days where temperatures were higher than 30°C. Rainfall totals for the three summer months of June, July and August was 258.5 mm. This is considered to be a normal rainfall value for the summer months.

The Otonabee Water Response Team met monthly from May – October 2022. There were no Low Water Advisory Conditions issued during the summer months in 2022.

Pilot Plant

The Peterborough Water Treatment Plant, working together with the University of Toronto's Drinking Water Research Group (DWRG), has completed pilot-scale studies to optimize production, improve water quality, and investigate next-generation treatment technologies for the citizens of Peterborough.

A 5000:1 scale-model version of the main treatment facility, the pilot plant includes processes such as coagulation, tapered mixing, flocculation, settling and filtration. In addition to conventional water treatment studies, ozone and advanced oxidation applications have been investigated.

Ozone

Our current studies in 2022 focused on the assessment and integration of ozone into our full-scale applications. Previous research at our facility has shown the effectiveness of ozone on the reduction of both disinfection by-product (DBP) formation and taste-and-odor compounds. The primary objective of our study was to determine if ozone could be incorporated as a pre-coagulant oxidant and assess infrastructure and energy costs associated with implementation.

During the studies, ozone applied in the source water was shown to reduce natural organic matter (NOM) by 58% when compared to controls. The reduction in DBP formation will allow the water treatment plant to continue to meet and exceed water quality regulations and improve the water quality for consumers.

Based on the pilot studies, ozone systems are being designed that would include a liquid oxygen source for ozone generation and hydrogen peroxide for advanced oxidation. Following the pilot plant studies, an assessment of the integration of ozone into the full-scale plant was conducted by the engineering firm RV Anderson Associates (RVA). The assessment from RVA outlined infrastructure and energy requirements, operating costs, and building upgrades required for the integration of ozone at the Peterborough WTP.

Customer Service

Customer Calls

Customer concerns relating to water are tracked by WTP staff and logged using computer software. Some questions and concerns that were asked to our WTP staff were related to taste and odour, colour, hardness, general water quality, information on water treatment, sampling, operations, and questions to assist with school projects on water treatment.

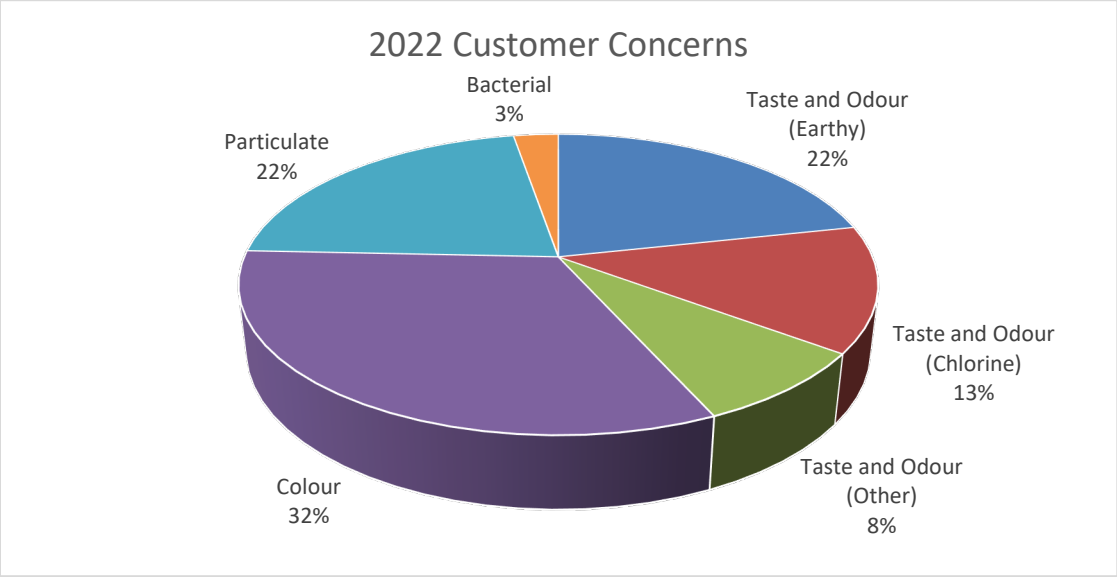
In 2022, staff responded to a total of 37 inquiries. The 37 inquiries were related to the following concerns; 32% of customer concern calls were relating to colour (usually rusty coloured water), 22% were relating to particulate matter, a total of 43% relating to taste and odour, and 3% relating to bacteriological concerns (Chart 7). The number of calls were consistent in 2022 to those received in 2021.

A further breakdown of the 16 taste and odour complaints revealed the following: 8 concerns were for an earthy musty odour, 5 concern was for a chlorine taste and odour, and 3 concerns were for various other taste and odours, from metallic to medicinal.

Tours

Tours have been an important part of public education at the Peterborough Water Treatment Plant. During 2022 tours were suspended as a result of the pandemic.

Chart 8



Riverview Park & Zoo

In 2022, Riverview Park and Zoo operations were moderately impacted by the COVID-19 pandemic. The Park and Zoo was closed for the first quarter of the year as a precautionary measure with pre-booked scheduled tours only. The park and zoo areas were reopened in mid-March with added distance fencing; however, no indoor facility bookings were permitted and many of our education programs were modified to hybrid virtual-in-person programs that remained strictly outdoors. Special events were also modified or cancelled altogether.

Getting back up to speed was challenging as most of our seasonal student staff were new and required extra time and effort for training. Facilities that had not been opened in over two years, also required extra effort, maintenance, and repair. Park and Zoo Staff were able to get all amenities and facilities running by June. The educational staff offered a full selection of programs and the post pandemic field trip response resulted in our busiest programming year ever. Continued issues with supply and service associated with the pandemic were still present, however the team made significant progress to ongoing improvements to the facilities and equipment in 2022.

The zoo's animal collection saw many changes in 2022 with the deaths of some of our older animals as well as new acquisitions. Deaths included a turkey, a plated lizard, a barbary sheep, a premature meerkat, dart frogs, and the passing of Ruth our older blind squirrel monkey, and our senior river otter, Melissa.

Other changes included the acquisition of a variety of animals including yellow footed tortoise, collard peccaries, a green water dragon, a leopard tortoise, two Dumeril's boa constrictors, and three species of dart frogs. Our main collection focus in 2022 was building up our herd animal numbers for better social enrichment and welfare for the yak and barbary sheep herd.

Additions to the collection also included the birth of peafowl chicks, yellow-footed tortoise eggs and two African Dwarf Crocodiles hatchlings.

Park Operation & Facilities

Most of the Park and Zoo's areas, amenities and facilities were reopened in the spring of 2022 after a two-year closure. The miniature train ride was subject to vandalism ahead of opening weekend and the train bell was stolen; however, this sparked energy and contributions from many residents and schools who supported the repairs through generous donations.

The operating season was shortened by the devastating windstorm on the May long weekend that impacted all of

Peterborough and surrounding regions.

Exhibits and buildings were damaged, but no animals or people were hurt, no animal escaped their enclosure, and life systems were supported in the following days with our onsite diesel generators. It took the entire staff crew team and our contracted arborists a full week to clear the debris and reopen. It was a rough start to the season, but the full-time staff were extremely proud of the novice student employees, their professional responses, and use of emergency plan training and drills. We are still feeling impacts from the storm, with tree damage and erosion of the slope embankment. A full assessment of the urban forest and further need to manage the trees and limbs will continue to 2023.

The splash pad required a new computer control system to reopen for the year. The park grounds and pathways were fully open for walk-through access and the disc golf course and playground were in full use. Donations from the Kiwanis Club of Scott Plains made the repair to the 80-foot super slide possible.

Zoo Operations & Facilities

Zoo operations and specifically animal care and wellness are a top priority and excellent animal care was delivered in 2022. Our operations were impacted by reduced seasonal staffing due to the fiscal impact of the pandemic, segregated teams, work areas, and routines as part of our pandemic response plan, as well as by staff absences due to COVID testing/self-isolation. Having adequate resources to provide animal care required extensive adaptation and the curtailment of many non-critical activities throughout 2022.

Regular and emergency veterinary care was provided primarily by consulting veterinarian Dr. John Sallaway throughout the year. Park and Zoo Animal Care Staff worked with Dr. Sallaway throughout the year to provide planned animal health care to the animals in our collection. Animals were examined and/or treated as part of their annual health care program. This included physical exams, surgery, numerous vaccinations/treatments, blood samples, the trimming of many hooves/claws/beaks/tusks, dentistry, and dental cleaning.

The Animal Enrichment and Training programs were enhanced in order to have animals willingly participate in health assessments and procedures like visual inspection, injection training and squeeze training for blood draws. This reduces stress on the animals and the need for anesthesia or capture for routine procedures.

In 2022, there were 12,808 individual specimen activities performed with over 30 species. Training sessions involving 5 different species reached 153 individual volunteer health training sessions.

Zoo Animal Collection

In 2022 there were 5 births/hatchings and 12 deaths of animals during the year. Post-mortems were performed on those animals that had died, to determine the cause of death where possible. Acquisitions of 20 new animals were accomplished during the year.

As of December 31, 2022, the animal collection on site consisted of 119 animals, representing a total of 52 species (excluding groups of fish and invertebrates).The collection had 36 animals in on loan and 13 animals out on loan.(Table 6).

Table 6

	January 1	Birth/ Hatchings	Acquisitions	Deaths	Disposition	December 31
# Animals Owned on site	92	3	17	10	19	83
# Animals at Zoo on Loan	39	2	3	2	6	36
# Animals out on loan	14	0	0	1	0	13
Total Animals On Site	131	5	20	12	25	119

Capital Program

The installation phase three of a camel chute was completed in 2022. This promotes privacy for animal health procedures and compound to support the camel's propagation. This is an important part of our Species Survival Plan (SSP) to ensure a healthy genetically diverse captive population of critically endangered species. The installation of a perimeter fence automated gate was commissioned as an emergency measure to prevent escaped animals as recommended in the 2019 CAZA audit. An otter exhibit presentation stand was built for maximum visibility and engagement during public otter enrichment sessions. Several maintenance and safety improvements through the zoo facilities, exhibits and park were also completed including eave-troughs, shifts, waste management, bird friendly features and additional barricades to keep our animals safe. Engineered drawings were commissioned and designed for tender of an accessible parking lot ramp to be built it 2023 through the Enabling Accessibility project grant.

Revenue Contributions

In 2022, the Riverview Park and Zoo's revenue for the year was back to business, with train operations, food services, and retail sales for a total of $267,628.

The Snack Bar felt significant losses from the May storm which impacted food revenue profit share at 80% of projected target equaling $14,000. The gift shop reopened in 2022 and reached record-breaking sales and profit earning $114,023 which was 134% of annual projected sales target.

Train revenue, though delayed in the beginning of the season, in addition to increased downtime for maintenance needs throughout 2022, welcomed 66,547 riders, earning $133,094 in $2 ticket sales.

Facility rentals were not permitted in 2022, therefore the revenue target was not met.

Overwhelming uptake in education programs earned $15,972 or 160% of 2022 projected goals.

The second edition Limited-Edition Miniature Train Ride Puzzle Fundraiser was launched in the fall of 2022. The project was championed by Advisory Board and PUC members, who recruited active retailers including Brant Basics, House of Scales, Griffins Greenhouse, Fork in the Road Country Market Peterborough's Farmers Market and Ennismore Pharmacy. The support of these advocates during this 2-month effort raised $2,400 with sales ongoing until sold out.

The Kiwanis Club and Kinsmen Club of Peterborough came on board our capital train campaign as a partnership level sponsors, committing $25,000 donation each for a train passenger coach. The Knights of Columbus, Snack Bar "Top up your bill campaign", train seat dedications and online donation support achieved our two-year goal of $250,000 by the end of 2022. Procurement of the train and final efforts to fundraise 50% of the cost of the train replacement and installation will continue into the next fiscal year. Our new goal, based on the changed economy and locomotive

pricing has been determined at nearly $600,000. We have engaged partners and donors to get on board the train campaign for the following year.

Fundraising efforts were successful with many online and onsite donations contributing to operating funds and capital reserve funds. Operating fundraising totals reached $35,195, including $10,000 in cash box and fountain donations, $15,800 in Animal Adoptions.

Local businesses stepped up to help support the Park and Zoo including Ennismore Pharmacy's Mother's Day, Father's Day and seasonal holiday raffle soliciting support from 30 local businesses for gift basket items raising $7,500 in 2022.

Life as a Salesman book proceeds all donated to the Park and Zoo raised nearly $8,000 toward our capital reserve fund.

Businesses like Brealey Animal Clinic and the Kawartha Veterinary Association chose Riverview Park and Zoo as the recipient of the annual fundraisers with their membership or clients supported the animal care operating funds.

Grant applications and awards were maximized, significant examples of success include:

- Canada Summer Jobs supporting 19 students with employment subsidy: $39,000
- Healthy Communities Bird Friendly Trail at Riverview Park and Zoo $18,000
- Pathway to Stewardship Delivery Partner – 2022 $5,100

Total awards from all Grants was $183,954.

Education

In person education programs resumed in 2022. Limited spaces were booked quickly, and many schools and classrooms came without a program or shelter reservation. Our audit accounted for over 10,000 students visiting the park and zoo in May and June and only 10% had reserved a formal program.

Park and Zoo education programs raised a record breaking $15,972 including our virtual adaptations of our education programs that were maintained by several schools. The Bondar Challenge program connecting youth to nature through the art of photography in partnership with Otonabee Conservation engaged 22 participants in person for the first time since 2019.

Other programming included:

- virtual “Classroom Pets” “Zoo Trek” tours as delivery agents of the Pathway to Stewardship Program: Classroom Pets reaching early years classrooms focused on Landmark #3: weekly positive interactions with animals. Over 500 students participated in this program.

- Virtual Environment Symposium with both local school boards on biodiversity and conservation in May engaged over 800 students in 2 days.

- Riverview Park and Zoo partnered with Animal Welfare Services to train new staff on the safe handling of exotic animals.

- Virtual Peterborough Children’s Water Festival Water Wednesday session animated Water Festival Stations the Royal Flush that focused on water conservation at the zoo welcomed 400 virtual participants.

Additional programming and the conservation exhibit made possible by the support of 58 active volunteers in 2022 who supported education programs and guided tours, created virtual program resources at home, participated in litter pick-up and invasive species removal day-events, sat on advisory boards, and education committees and helped operate our gift shop. These volunteers contributed over 2500 hours in-kind.

In addition, we hosted 5 post-secondary placement students from Conservation Biology, Travel and Tourism, Museum and Curatorship Management Program and Alternative Education Placement Programs from Trent University and Fleming College that provided over 750 hours of research, resource development and ethogram observations in 2022.

Conservation

The Park and Zoo's conservation program included our ongoing support of the Ontario Turtle Conservation Centre's work by donating heat lamp bulbs, turtle feed (smelt) and equipment of over $6,000 as well as releasing hatched turtles back to their natural environments post rescue. The Park and Zoo also participated in the Association of Zoos and Aquariums (AZA) Stud Book for red-necked wallaby, Sichuan takin and Bactrian Camel. We also participated in the slender-tailed meerkat and common squirrel monkey AZA Species Survival Plans, as well as the Emu and Brazilian agouti Population Management Plans. The Park and Zoo is a founding member of Bird Friendly Peterborough. The Healthy Communities Grant allowed for the installation of bird friendly features on our exhibit windows and planting of species that would support our migratory and native bird species on our new bird friendly trail.

Research

In 2022 we hosted 4 Research Students from Trent University Conservation Biology who are helping us to study the animals, with observation and ethograms which helps support our Enrichment and Training Program for better insight into animal welfare needs of social groups in captivity for our squirrel monkeys and slender-tailed meerkats. Their findings and projects will contribute as a pilot for ongoing projects in subsequent years.

Special Events

Some special events planned for 2022 had to be cancelled. This included large events like the Zoo Fun Run and Brew at the Zoo. More modest and outdoor events like the Summer Concert Series, VIP Train Campaign Event were successful and welcomed many visitors and supporters. Five conservation events by partner organizations including GreenUP, Otonabee Conservation, Turtle Conservation Centre, Ontario Federation of Anglers and Hunters and our local beekeeper were hosted outside of the Dobbin building. A partnership with the Peterborough Library created a beloved summertime series called "Storytime at the Zoo, Stories in the Park, and Storytime on the Train" with great success.

Staff & Volunteers

As of December 2022, permanent staff included 1 Manager and Curator, 1 Zoo Supervisor, 1 Program Supervisor, 1 Groundskeeper, 1 Animal Care Technician, 4.5 Zookeepers and 1 Park & Zoo Maintenance person.

Student positions returned to seasonal staffing levels 20 student employees assisting with Park and Zoo operations. Student employee positions included 4 zookeepers, 4 public educators, and 3 horticulture/ groundskeeping workers, 4 maintenance staff and 5 train operators.

Appendix A – Financial Statement

PETERBOROUGH UTILITIES COMMISSION

FINANCIAL STATEMENTS

AT DECEMBER 31, 2022

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INDEPENDENT AUDITOR'S REPORT

To the Chair and Members of the Peterborough Utilities Commission

Opinion
We have audited the financial statements of Peterborough Utilities Commission (the Commission), which comprise the statement of financial position as at December 31, 2022 and the statements of operations and accumulated surplus, changes in net financial assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Commission as at December 31, 2022, and the results of its operations and cash flows for the year then ended in accordance with Canadian Public Sector Accounting Standards.

Basis for Opinion
We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Commission in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements
Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian Public Sector Accounting, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Commission's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Commission or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Commission's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements
Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Commission's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Commission's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Commission to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants
Licensed Public Accountants

Baker Tilly KDN LLP

Peterborough, Ontario
April 20, 2023

bakertilly

PETERBOROUGH UTILITIES COMMISSION
STATEMENT OF FINANCIAL POSITION
At December 31, 2022

	2022 $	2021 $
FINANCIAL ASSETS		
Cash (Note 3)	26,535,573	26,924,795
Accounts receivable		
Customer accounts	1,170,531	897,300
Sewer surcharge	1,318,861	1,304,193
Sundry	768,759	369,995
Unbilled water revenue on customer accounts	1,708,280	1,579,000
Unbilled sewer surcharge	1,708,280	1,596,000
	33,210,284	32,671,283
LIABILITIES		
Accounts payable and accrued charges	5,130,242	5,616,203
Sewer surcharge payable (Note 5)	3,726,876	3,650,094
Long term debt (Note 4)	12,115,977	13,173,275
Customer deposits	409,910	430,688
	21,383,005	22,870,260
NET FINANCIAL ASSETS	11,827,279	9,801,023
NON-FINANCIAL ASSETS		
Inventories	792,049	609,003
Tangible capital assets (Note 6)	121,612,018	120,538,685
	122,404,067	121,147,688
ACCUMULATED SURPLUS (Note 7)	**134,231,346**	**130,948,711**

Approved By The Commission

_____, Chair

_____, Member

The accompanying notes are an integral part of this financial statement.

PETERBOROUGH UTILITIES COMMISSION
STATEMENT OF OPERATIONS AND ACCUMULATED SURPLUS
For The Year Ended December 31, 2022

	Budget 2022 $ (Unaudited)	Actual 2022 $	Actual 2021 $
REVENUES			
Sale of water	18,780,000	18,729,962	18,559,285
Contributed capital installation charges	300,000	522,022	118,054
Development charges earned	667,000	596,951	831,010
Fire protection	650,000	650,000	650,000
Sewer surcharge billings	439,000	439,000	430,000
Riverview Park and Zoo (Note 11)	301,000	312,822	78,383
Interest	160,000	620,939	153,894
Other	325,000	321,136	449,686
Electricity	350,000	280,452	300,110
Donations	25,000	139,411	51,877
	21,997,000	22,612,695	21,622,299
EXPENSES			
Water treatment and storage	4,782,000	4,357,134	4,133,072
Water distribution	2,394,000	2,213,994	2,418,859
Riverview Park and Zoo (Note 11)	1,851,000	2,041,057	1,745,718
Administration	4,169,000	4,272,235	4,145,871
Amortization	6,380,000	6,099,524	6,103,414
Interest	370,000	346,116	353,226
	19,946,000	19,330,060	18,900,160
ANNUAL SURPLUS	2,051,000	3,282,635	2,722,139
OPENING ACCUMULATED SURPLUS	130,561,000	130,948,711	128,226,572
CLOSING ACCUMULATED SURPLUS	**132,612,000**	**134,231,346**	**130,948,711**

The accompanying notes are an integral part of this financial statement.

PETERBOROUGH UTILITIES COMMISSION
STATEMENT OF CASH FLOWS
For The Year Ended December 31, 2022

	2022 $	2021 $
CASH PROVIDED BY (USED IN):		
OPERATIONS		
Annual surplus	3,282,635	2,722,139
Add: Non-cash charges to operations		
Amortization	6,099,524	6,103,414
Contributed capital installation charges	(522,022)	(118,054)
	8,860,137	8,707,499
Change in non-cash working capital items (Note 8)	(1,541,226)	2,881,204
	7,319,911	11,588,703
INVESTING ACTIVITY		
Purchase of tangible capital assets	(6,650,835)	(7,115,178)
FINANCING ACTIVITIES		
Repayment of long term debt	(1,057,298)	(1,043,095)
NET CHANGE IN CASH DURING THE YEAR	(389,222)	3,430,430
CASH POSITION - BEGINNING OF YEAR	26,924,795	23,494,365
CASH POSITION - END OF YEAR	**26,535,573**	**26,924,795**

The accompanying notes are an integral part of this financial statement.

PETERBOROUGH UTILITIES COMMISSION
STATEMENT OF CHANGES IN NET FINANCIAL ASSETS
For The Year Ended December 31, 2022

	Budget 2022 $ (Unaudited)	Actual 2022 $	Actual 2021 $
Annual Surplus	2,051,000	3,282,635	2,722,139
Acquisition of Tangible Capital Assets	(9,603,000)	(7,172,857)	(7,233,232)
Amortization of Tangible Capital Assets	6,380,000	6,099,524	6,103,414
Decrease in Inventories	-	(183,046)	(81,464)
Change In Net Financial Assets	(1,172,000)	2,026,256	1,510,857
Net Financial Assets, beginning of year	7,318,000	9,801,023	8,290,166
Net Financial Assets, end of year	**6,146,000**	**11,827,279**	**9,801,023**

The accompanying notes are an integral part of this financial statement.

PETERBOROUGH UTILITIES COMMISSION
NOTES TO THE FINANCIAL STATEMENTS
For The Year Ended December 31, 2022

1. NATURE OF ORGANIZATION

Operating under the authority of the Municipal Act, the Peterborough Utilities Commission (the "Commission") provides water services to the residents of the City of Peterborough along with operational governance and funding for the Riverview Park and Zoo.

2. SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Peterborough Utilities Commission have been prepared in accordance with Canadian generally accepted accounting principles for local governments and their local boards as recommended by the Public Sector Accounting Board of the Chartered Professional Accountants Canada.

Significant aspects of the accounting policies adopted by the Commission are as follows:

(a) Recognition of Revenue and Expenses

Revenue is recorded using the accrual basis of accounting, as water is used by customers. Unbilled revenue is calculated as the estimated consumption between the last meter reading date and the year end date.

The value of distribution systems installed by developers is recorded in revenue as capital installation charges in the year in which the Commission assumes ownership at the fair market value.

Development charges are recognized as revenue when they are transferred out of the reserve fund and spent on growth related projects.

Revenue from fire protection, sewer charges and electricity is recognized when the service is provided.

Expenses are recognized in the period the goods or services are acquired and a legal liability is incurred by transfers are due.

(b) Management Estimates

The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities as well as the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenditures during the year. Significant estimates and assumptions used in the preparation of financial statements include, but are not limited to: estimates of revenue, allowance for doubtful accounts, and amortization rates and carrying values of property, plant and equipment. Actual results could differ from these estimates.

(c) Inventories

Inventories consist of maintenance supplies and construction materials and are valued at the lower of moving average cost and replacement cost.

(d) Tangible Capital Assets

Tangible capital assets are stated at cost or deemed cost. Amortization on the water treatment plant and reservoirs, distribution system and Riverview Park and Zoo (purchased from operating and donated funds) is recorded on a declining balance basis at a rate of 5% per annum. Water meters are amortized on a straight-line basis over 20 years. The Commission capitalizes assets with a value of $5,000 or greater.

Tangible capital assets categorized as construction-in-progress are not amortized until they are put into service.

PETERBOROUGH UTILITIES COMMISSION
NOTES TO THE FINANCIAL STATEMENTS
For The Year Ended December 31, 2022

2. **SIGNIFICANT ACCOUNTING POLICIES** - (Continued)

(e) Reserve Funds

Certain amounts as approved by the Commission and those required under legislative or other authority are set aside in reserve funds for future operating or capital purposes. Transfers to and/or from reserve funds are an adjustment to the respective fund when approved or required by agreement.

The following reserve funds are included in the accumulated surplus:

(i) Water Treatment Plant Reserve Fund

In December 1990, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for the purpose of upgrading the water treatment plant. The established practice is to appropriate 4.2% of the water revenues to this fund each year. Utilization of these funds is authorized by the Commission.

(ii) Development Charges Act Reserve Fund

The Peterborough Utilities Commission is authorized under the City of Peterborough by-law to establish a reserve fund for development charges. The purpose of the fund is to cover growth related net capital costs incurred by the Water Utility for water treatment, storage, and distribution systems.

(iii) Park And Zoo Major Projects Reserve Fund

In September 1993, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for major projects at the Riverview Park and Zoo. The revenues received for this fund include donations from estates and the general public, the utility's share of profits from the refreshment booth operations and profits from the sale of birds and animals. Utilization of these funds is authorized by the Commission on a project by project basis based upon the recommendation of the Riverview Park and Zoo Advisory Committee.

(iv) Park and Zoo Animal Care Reserve Fund

In July 1999, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for animal care at the Riverview Park and Zoo. The fund was established through a capital donation from a Peterborough resident. The income generated annually will be used for the care, treatment, habitat or display of the animals at the Riverview Park and Zoo for special or exceptional purposes beyond standard care.

(v) Park and Zoo State of Good Repair Reserve Fund

In November 2016, the Commission authorized the establishment of an internally restricted Riverview Park and Zoo state of good repair reserve fund. The purpose of the fund is to cover major repair and maintenance costs incurred by the Riverview Park and Zoo that would be required to maintain the quality of its tangible capital assets.

(f) Non-Financial Assets

Tangible capital and other non-financial assets are accounted for as assets by the Commission because they can be used to provide services in future periods. These assets do not normally provide resources to discharge the liabilities of the Commission unless they are sold.

PETERBOROUGH UTILITIES COMMISSION
NOTES TO THE FINANCIAL STATEMENTS
For The Year Ended December 31, 2022

2. **SIGNIFICANT ACCOUNTING POLICIES** - (Continued)

(g) Inter-Entity Transactions

The Commission has an agreement with the City of Peterborough, which results in transactions between the two entities.

Allocated costs between the City of Peterborough and the Commission, are measured at the exchange amount, which is the amount of consideration established and agreed to by the parties.

Unallocated costs are measured at the carrying amount, which is the amount recorded in the records of the City of Peterborough.

3. **CASH**

	2022 $	2021 $
Unrestricted cash	18,085,308	15,713,115
Restricted cash	8,450,265	11,211,680
	26,535,573	26,924,795

4. **LONG TERM DEBT**

Long term debt is issued on behalf of the Commission by The Corporation of the City of Peterborough and consists of the following:

Date of Maturity/Payment Terms	Interest Rate %	2022 $	2021 $
July 5, 2027, semi-annual blended payments of $274,120	3.18	2,515,977	2,973,275
November 6, 2036, semi-annual principal payments of $150,000 plus interest	2.79	4,200,000	4,500,000
December 15, 2040, semi-annual principal payments of $150,000 plus interest	2.04	5,400,000	5,700,000
		12,115,977	13,173,275

PETERBOROUGH UTILITIES COMMISSION
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4. **LONG TERM DEBT-** (Continued)

Future repayments for the long term debt are as follows:

	Principal $	Interest $	Total $
2023	1,071,955	299,982	1,371,937
2024	1,087,083	270,947	1,358,030
2025	1,102,695	240,262	1,342,957
2026	1,118,808	209,659	1,328,467
2027	1,135,436	178,540	1,313,976
Thereafter	6,600,000	895,452	7,495,452
	12,115,977	2,094,842	14,210,819

5. **RELATED PARTY AND INTER-ENTITY TRANSACTIONS**

The Commission is a board of the City of Peterborough and is consolidated with the City's financial statements. In the ordinary course of business, the Commission enters into transactions with the Corporation of the City of Peterborough and other related corporations. These transactions, which include the sale of water and the purchase and sale of other goods and services, are exchanged at the same prices and terms as arm's length customers. The affiliated corporations of the Commission are:

The City of Peterborough Holdings Inc.,
Peterborough Utilities Services Inc.,
Peterborough Utilities Inc., and
PUG Services Corp.

Details of services provided to Peterborough Utilities Commission during the year by Peterborough Utilities Services Inc. are as follows:

	2022 $	2021 $
Expenditures		
Professional services	9,262,355	9,188,882
Building rent	394,678	370,405
Software and equipment rent	183,788	171,739
	9,840,821	9,731,026

Billing and collecting for the sewer surcharge is done by the Commission for the City of Peterborough. During the year $439,000 (2021 - $430,000) was recognized as revenue for providing this service. At December 31, the sewer surcharge payable of $3,726,876 (2021 - $3,650,094) recognized on the Statement of Financial Position is payable to the City of Peterborough. All amounts owing to the City are unsecured, without interest and no specific terms of repayment.

PETERBOROUGH UTILITIES COMMISSION
NOTES TO THE FINANCIAL STATEMENTS
For The Year Ended December 31, 2022

6. **TANGIBLE CAPITAL ASSETS**

	Water Treatment Plant and Reservoirs $	Water Distribution System $	Riverview Park and Zoo $	Other $	Construction In Progress $	Total $
Cost Or Deemed Cost						
Balance at January 1, 2021	51,309,902	183,134,238	11,486,171	17,403	2,827,047	248,774,761
Additions	228,071	5,861,957	292,217	-	851,987	7,233,232
Balance At December 31, 2021	51,537,973	188,995,195	11,778,388	17,403	3,679,034	256,007,993
Additions	590,569	3,725,006	174,977	-	2,682,305	7,172,857
Balance At December 31, 2022	52,128,542	192,720,201	11,953,365	17,403	6,361,339	263,180,850
Accumulated Amortization						
Balance at January 1, 2021	27,149,495	96,852,799	5,346,341	17,259	-	129,365,894
Amortization for the year	1,101,238	4,687,872	314,297	7	-	6,103,414
Balance At December 31, 2021	28,250,733	101,540,671	5,660,638	17,266	-	135,469,308
Amortization for the year	1,066,642	4,722,613	310,262	7	-	6,099,524
Balance At December 31, 2022	29,317,375	106,263,284	5,970,900	17,273	-	141,568,832
Net Book Value						
At December 31, 2021	23,287,240	87,454,524	6,117,750	137	2,679,034	120,538,685
At December 31, 2022	22,811,167	86,456,917	5,982,465	130	6,361,339	121,612,018

PETERBOROUGH UTILITIES COMMISSION
NOTES TO THE FINANCIAL STATEMENTS
For The Year Ended December 31, 2022

7. ACCUMULATED SURPLUS

Accumulated surplus consists of the following:

	2022 $	2021 $
Operating surplus	16,285,040	12,371,621
Investment in tangible capital assets		
Tangible capital assets - net book value	121,612,018	120,538,685
Long term debt	(12,115,977)	(13,173,275)
Reserve funds (Note 10)	8,450,265	11,211,680
	134,231,346	130,948,711

8. CHANGE IN NON-CASH WORKING CAPITAL ITEMS AND OTHER INFORMATION

	2022 $	2021 $
Accounts receivable	(686,663)	(134,277)
Unbilled revenue and sewer surcharge	(241,560)	-
Inventories	(183,046)	(81,464)
Accounts payable and sewer surcharge payable	(409,179)	3,469,480
Customer deposits	(20,778)	(372,535)
	(1,541,226)	2,881,204
Other information:		
Interest paid	329,129	357,822

9. BUDGET FIGURES

The budget, approved by the Commission, for 2022 is reflected on the Statement of Operations and Accumulated Surplus and the Statement of Changes in Net Financial Assets. The budgets established for capital investment in tangible capital assets are on a project-oriented basis, the costs of which may be carried out over one or more years and therefore may not be comparable with current year's actual amounts. Budget figures have been reclassified for the purposes of these financial statements to comply with Public Sector Accounting Board reporting requirements. Budget figures are not subject to audit.

PETERBOROUGH UTILITIES COMMISSION
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10. **RESERVE FUNDS**

	Budget 2022 $ (Unaudited)	Actual 2022 $	Actual 2021 $
TRANSFERS FROM OPERATIONS:			
Sale of water	783,000	775,028	773,303
Development charges	667,000	598,951	831,010
Interest	77,000	332,592	74,211
Donations	25,000	139,411	51,877
	1,552,000	1,843,982	1,730,401
TRANSFERS			
For tangible capital assets	(4,667,000)	(4,605,397)	(832,579)
CHANGE IN RESERVE FUNDS	(3,115,000)	(2,761,415)	897,822
OPENING RESERVE FUNDS	11,207,000	11,211,680	10,313,858
CLOSING RESERVE FUNDS	**8,092,000**	**8,450,265**	**11,211,680**
ANALYZED AS FOLLOWS:			
INTERNALLY RESTRICTED			
Water treatment plant reserve fund		7,013,962	9,953,856
Park and zoo state of good repair reserve fund		107,348	104,394
		7,121,310	10,057,166
EXTERNALLY RESTRICTED			
Park and Zoo major projects reserve fund		821,140	660,697
Park and Zoo major animal care reserve fund		507,815	493,838
		1,328,955	1,154,515
		8,450,265	**11,211,680**

PETERBOROUGH UTILITIES COMMISSION
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11. OPERATIONS FOR RIVERVIEW PARK AND ZOO

	Budget 2022 $ (Unaudited)	Actual 2022 $	Actual 2021 $
EXPENSES			
Maintenance park	697,000	652,768	474,436
Maintenance train	101,000	97,154	2,858
Animal care and zoo maintenance	1,053,000	1,291,135	1,268,424
	1,851,000	2,041,057	1,745,718
REVENUES			
Train	130,000	133,094	-
Miscellaneous	171,000	179,728	78,383
	301,000	312,822	78,383
NET EXPENSES FOR THE YEAR	**1,550,000**	**1,728,235**	**1,667,335**

Appendix B – Abbreviations

Abbreviation	Full Description
2-MIB	2-methlisoborneol
CFU	Colony Forming Unit
COD	Chemical Oxidization Demand
CTS	Calcium Thiosulphate
DBP	Disinfection by-product
DWQMS	Drinking Water Quality Standard
DWRG	Drinking Water Research Group
EDC	Endocrine disrupting compounds
HAA	Haloacetic Acid
KM	Kilometers
L/m	Litres per Minute
m2	Square Meters
m3	Cubic Meters
MAC	Maximum Acceptable Concentration
mg/L	Milligram per Litre
ML	Megalitres
MECP	Ministry of Environment & Climate Change
MOH	Medical Officer of Health
ηg/L	Nanogram per Litre
NTU	Nephelometric Turbidity Unit
ODWQS	Ontario Drinking Water Quality Standards
ORCA	Otonabee Region Conservation Authority
ORP	Oxidative Reduction Potential
PACL	Polyaluminum Hydroxychloride
PUC	Peterborough Utilities Commission
PUGSC	Peterborough Utilities Services Inc.
RP& Z	Riverview Park & Zoo
STS	Sodium thiosulphate
THM	Trihalomethane
TOC	Total Organic Carbon
µg/L	Microgram per Litre
UVA	Ultra Violet Absorbance
WTP	Water Treatment Plant