

1. Introduction

This provides the City of Owen Sound's Quarterly Drinking Water Quality Report for the Third Quarter of 2001. The Ontario Ministry of the Environment's recently tabled legislation, The Drinking Water Protection Regulation (Reg. 459/00), mandates this reporting requirement. Further information concerning this Regulation can be found either through the Ministry of Environment's Web Site at www.ene.gov.on.ca/envision/WaterReg/WaterReg.htm or by calling the local Ministry of the Environment Office at 371-2901.

This, and future reports, are available at:

| | | |
|---------------------------------|----|-----------------------|
| Clerk's Office | | City of Owen Sound's |
| Owen Sound City Hall | or | Public Works Division |
| 808 2 nd Avenue East | | 1900 20th Street East |
| Owen Sound, Ontario | | Owen Sound, Ontario |
| N4K 2N4 | | N4K 5N3 |

Or on the City's Web Site at www.city.owen-sound.on.ca/water/

This report covers the period from July 1st, 2001 to September 30th, 2001.

2. Introduction

The City's Drinking Water is supplied by the Richard H. Neath Water Treatment Plant (R.H. Neath WTP), is located at 2600 3rd Avenue East in Owen Sound, Ontario. The facility was built in two phases. Plant 1 was constructed in 1967. In 1980 the facility was twinned with the addition on Plant 2. This expansion doubled the facility's capacity to provide a total treatment capacity of 60.48 ML/d. The facility provides potable water to approximately 22,000 residents, an expanding commercial base, and several large industrial customers.

3. Facility Background

The R.H. Neath WTP is a direct filtration plant with the following unit process components:

- raw water pumping
- pre-chlorination (including seasonal zebra mussel control)
- coagulant addition
- flash mixing
- flocculation
- filtration
- backwash capabilities
- post-chlorination
- fluoridation
- treated water storage
- municipal treated water pumping
- industrial treated water pumping

Facility Background Continued;

The R.H. Neath WTP contains two water treatment trains. Each treatment train is equipped with similar unit process components, but convey separate flow streams according to equipment on line, demand and their individual rated capacities. A process flow diagram of the R.H. Neath WTP is presented in Figure 1.

The raw water for the R.H. Neath WTP is supplied by a 0.9-meter diameter intake extending approximately 670 meters into Georgian Bay into the plant's low lift pumping station. The low lift pumping station contains 3 pumps, one of which is equipped with a diesel drive. Raw water is screened, pre-chlorinated at the low lift pumping station or at the mouth of the intake pipe during warmer weather for zebra mussel control, and pumped via the low lift pump station to the rapid mix tanks through twinned 35 centimetre diameter pipes, one for each of the two Plants.

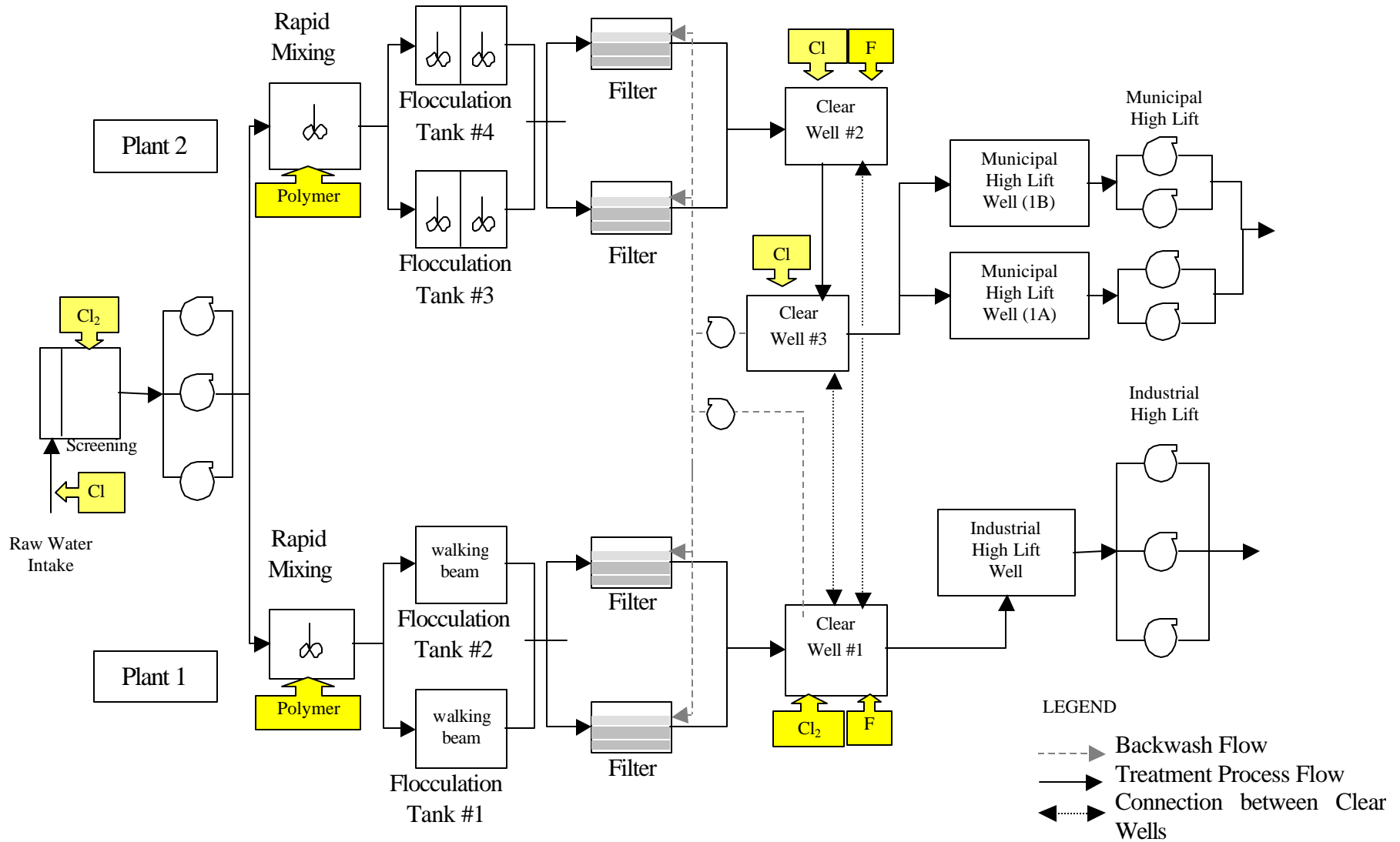
A coagulant, poly-aluminum chloride, is added to the raw water in the rapid mix tanks. Coagulated water from the rapid mix tanks is divided between the two parallel flocculation tanks in each Plant. Plant 1 uses walking beam flocculators and Plant 2 uses two stage tapered turbine mixing. Flocculation tank effluents are combined within each plant before being split between two parallel dual media filters for filtering. Filtered water from both Plants 1 and 2 is stored in Clear Wells 1 and 2, respectively, which are located below the process building. The treated water is post-chlorinated and fluoridated as it enters the Clear Wells.

Clear Wells 1, 2, and 3 are interconnected in order to provide equal water level in all wells. Treated water from Clear Well 1 is directed to the Industrial High Lift Pump Well for distribution to the pressurized Industrial Supply System through three Industrial high lift pumps, one of which is equipped with an auxiliary diesel engine. Treated water from Clear Well 1 flows into Clear Well 3 before it is directed into the Municipal High Lift Pump Wells for distribution to the municipal supply system through four municipal high lift pumps that pump treated water to the relevant distribution systems.

Filters are backwashed on a regular basis using treated water from Clear Well 1 and 3 on an alternating duty. Wastewater from the backwash process is returned untreated to Georgian Bay.

The facility boasts a state of the art Supervised Control And Data Acquisition (SCADA) System. The SCADA System continuously monitors all unit processes within the plant. It offers remote plant operations capabilities and full monitoring and alarm capabilities to facilitate operator intervention, either manually or through the Control system.

Figure 1: Process Schematic



4. Raw Water Quality

The turbidity and pH of raw water are measured on-line in the Low Lift Pump Well and are monitored by the SCADA system. Raw water samples, taken from the intake pipe prior to entering the Low Lift Pumping Station, are analyzed at the in-plant laboratory for turbidity once per day and aluminum concentration once per week. Tests for colour are performed daily, problems with colour usually are found during the seasonal spring/fall high runoff period.

5. Treated Water Quality

The treated water characteristics are monitored daily. The pH and chlorine residual of treated water are monitored by the SCADA system at various points of the treatment process. Daily treated water samples are taken for in-plant laboratory analysis for fluoride, chlorine residual, turbidity and colour. A new online turbidimeter was installed in March, 2001 which monitors the turbidity just before it leaves the water plant to the municipal customers.

6. Terms You Need To Know

Here are some terms you should know about before reading the information below.

MAC

Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration.

IMAC

Interim Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

AO

Aesthetic Objective. There is not a MAC or IMAC for this parameter. It is an aspect of drinking water quality, namely taste, odour, colour and clarity that are perceivable to the senses.

Parameter

This is a substance that we sample and analyze in water.

mg/l

milligrams per litre. This corresponds to one part of liquid in one million parts of liquid (parts per million (ppm)).

ug/l

micrograms per litre. This corresponds to one part of liquid in one billion parts of liquid (parts per billion (ppb)).

pg/l

picograms per litre. This corresponds to one part of liquid in one quadrillion parts of liquid (parts per billion (ppq)).

NTU

Nephelometric Turbidity Unit. This is a unit measurement for turbidity in a water sample.

n/a

Not applicable. Some columns may contain an n/a which means there is not a required value.

ns

No sample. This means that if for some reason a sample was not taken, the sample was damaged during transportation or not analyzed in a certain time period, there will not be a result.

nd

Not detectable. This means that a value could not be detected with means of analysis.

P

Pending. Results of the test has not come back from the laboratory yet. Update to follow.

Tr

Treated water sample.

R

Raw water sample.

7. What is in your water?

Water contains various microbes, metal salts, and organic and inorganic substances generally referred to as parameters. These parameters may be present in source water before the treatment process. Here is a description of the various groups of parameters.

Microbiological parameters such as bacteria may come from sewage plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of drinking water quality because of its association with dangerous water-borne diseases which can strike quickly.

Inorganic parameters such as salts and metals can be naturally occurring or a result of urban storm run-off, industrial or domestic wastewater discharge, mining or agriculture. Some may be a result of treatment and distribution of water (for example, lead from old solder in pipes).

Organic parameters can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm run-off and other sources. Included in this group are pesticides that originate from both rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination by-products such as trihalomethanes).

8. Compliance with the Ontario Drinking Water Standards

All health related sample results met the Ontario Drinking Water Standards with the following exceptions:

Bacteriological

The table below shows that our system had one exceedence for total coliform bacteria this quarter. The exceedence occurred during the month of August 2001. One of the fifty samples collected that month indicated the contaminant was present. Due to the condition that the sample was taken, which was from a hydrant diffuser, it is very difficult to sterilize the sampling point. Upon resampling, the result was <1 for Total Coliform.

The City of Owen Sound Water Section has looked at alternative methods of collecting samples from remote areas. We are in the process of installing a sampling station, this will allow us to collect a proper sample and minimize the risk of a false result.

Chlorine Residuals

During this quarter there were several samples taken which did not meet the Residual Free Chlorine requirement of 0.05 mg/l. The areas that did not meet this chlorine requirement are end of pipe, low flow areas.

All bacteriological results from these areas met the Ontario Drinking Water Standards.

The areas in question are: Greenwood Cemetery Area- City of Owen Sound
 Inglis Falls Area- former Derby Township
 Stone Tree Golf Course

Remedial action in these areas have included an enhanced flushing program. The sites listed above were flushed twice weekly.

9. Contacts

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The following information contains the analytical results for this quarter. The following tables identify which tests had detectable results. All tests performed are not necessarily listed below.

| Table A Parameters | MAC, | # of | | # of | | Sampling Date | Range | | Exceed ? | Typical Source of Contaminant |
|-----------------------------------|-------|---------|-----|------------|----|------------------|-------|----|-------------|--|
| | IMAC, | Samples | | Detectable | | | R | Tr | | |
| | AO | Results | | R | Tr | | | | | |
| E. Coli (counts/100 ml) | * | 13 | 152 | 0 | 0 | 07/01-09/30 | 0 | 0 | NO | Indicates presence of fecal matter. |
| Total Coliform (counts/100 ml) | * | 13 | 152 | 1 | 1 | 07/01-09/30 | 0.2 | 1 | YES | Found in the intestines of warm blooded mammals, including man, also found in soil, animals, and other insects. Presence of disease causing organisms. |

* indicator of adverse water quality if detected in treated water

| Parameter Related to Microbiological Quality | MAC, | # of | | # of | | Sampling Date | Range | | Exceed ? | Typical Source of Contaminant |
|---|-------|---------|-----|------------|-----|------------------|-------|-------|-------------|---|
| | IMAC, | Samples | | Detectable | | | R | Tr | | |
| | AO | Results | | R | Tr | | | | | |
| Turbidity - Finished (NTU) | 1.0 | CM | CM | CM | CM | 07/01-09/30 | n/a | 0.06 | NO | Indicates a small presence of particulates in water after filtration. |
| Turbidity - Raw (NTU) | n/a | CM | CM | CM | CM | 07/01-09/30 | 0.65 | n/a | n/a | Indicates a presence of suspended and colloidal matter. Indication of the clarity of the water. |
| Free Chlorine-Plant-Pre (mg/l) | n/a | CM | CM | CM | CM | 07/01-09/30 | 0.15 | n/a | n/a | First line of defence of contaminants. A free chlorine residual indicates that the chlorine demand has been met, and available chlorine is available. |
| Free Chlorine-Post (mg/l) | n/a | CM | CM | CM | CM | 07/01-09/30 | n/a | 0.97 | n/a | Additional protection against contaminants, also adds protection in the distribution system. |
| Aluminum - Raw (mg/l) | n/a | 13 | n/a | 13 | n/a | 07/01-09/30 | 0.002 | n/a | n/a | Aluminum is effective in coagulation/filtration and used at our Water Plant. There isn't clear evidence that aluminum had any effect on health. |
| Aluminum - Treated (mg/l) | 0.1 | n/a | 17 | n/a | 17 | 07/01-09/30 | n/a | 0.072 | NO | Aluminum is effective in coagulation/filtration and used at our Water Plant. There isn't clear evidence that aluminum has any effect on health. |
| Colour - Raw (NTU) | n/a | 92 | n/a | 92 | n/a | 07/01-09/30 | 0.3 | n/a | n/a | The substances in water that impart a yellowish-brown color to the water. These substances are the result of iron, manganese, peat materials, plankton, aquatic weeds, and industrial waste present in the water. |

| | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-------------|------|------|-----|---|
| Colour - Treated (NTU) | 5 | n/a | 92 | n/a | 92 | 07/01-09/30 | n/a | 0.1 | n/a | The substances in water that impart a yellowish-brown color to the water. These substances are the result of iron, manganese, peat materials, plankton, aquatic weeds, and industrial waste present in the water. |
| Fluoride-Treated (mg/l) | 1.5 | n/a | 46 | n/a | 46 | 07/01-09/30 | n/a | 0.39 | NO | Added to prevent tooth decay. |
| Fluoride-Raw (mg/l) | n/a | 4 | n/a | 4 | n/a | 07/01-09/30 | 0.18 | n/a | n/a | naturally occurring in our surface water (Georgian Bay). |
| Nitrate (as nitrogen) (mg/l) | 10 | 1 | n/a | 1 | n/a | 07/01-09/30 | n/a | 0.5 | NO | Present in water as a result of plant and animal matter, agricultural fertilizers and treated wastewater contamination. |

| Certificate of Approval Additional Testing (Zebra Mussel Control) | MAC, IMAC, AO | # of | | # of | | Sampling Date | Range | | Exceed ? | Typical Source of Contaminant |
|---|---------------------|---------|-----|------------|-----|------------------|-------------|-----|-------------|---|
| | | Samples | | Detectable | | | R | Tr | | |
| | | R | Tr | R | Tr | | | | | |
| Alkalinity (mg/l) | 30-500 | 1 | n/a | 1 | n/a | 07/01-09/30 | 72 | n/a | NO | Measure of the resistance of the water to the effects of acids added to water. 30-500 is an operational guideline. |
| Hardness (mg/l) | 80-100 | 1 | n/a | 1 | n/a | 07/01-09/30 | 85 | n/a | NO | Caused by dissolved calcium and magnesium. Hard water has a tendency to form scale deposits and can form excessive scum with regular soaps. |
| Calcium (mg/l) | n/a | 1 | n/a | 1 | n/a | 07/01-09/30 | 23.3 | n/a | NO | Naturally occurring minerals in a water source. It appears to be virtually harmless to all organisms. |
| Sodium (mg/l) | 200 | 1 | n/a | 1 | n/a | 07/01-09/30 | 3.4 | n/a | NO | Sodium is not toxic. Consumption of sodium in excess of 10 grams per day by normal adults doesn't have any apparent adverse health affect. |
| Iron (mg/l) | 0.3 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.86 | n/a | n/a | May be present in surface waters as a result of anaerobic decay in sediments and complex formations. |
| Copper (mg/l) | 1.0 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.47 | n/a | NO | Copper occurs naturally. Rarely present in raw water. Copper is used extensively in plumbing. |
| Lead (mg/l) | 0.01 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.009 | n/a | NO | Lead is only present as a result of corrosion of lead solder, lead containing brass fittings/pipes which could be in domestic plumbing. |
| Zinc | 5.0 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.07 | n/a | NO | The concentration of zinc may be considerably higher at the consumers tap |

| | | | | | | | | | | | |
|---|------|---|-----|---|-----|-------------|--------------|-----|-----|--|---|
| (mg/l) | | | | | | | | | | | in standing water because of corrosion taking place in galvanized pipe. |
| Aluminum (mg/l) | 0.1 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.19 | n/a | NO | | Aluminum is effective in coagulation/filtration and used at our Water Plant. There isn't clear evidence that aluminum had any effect on health. |
| Manganese (mg/l) | 0.05 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.168 | n/a | n/a | | Objectable in water supplies because it stains laundry and fixtures black, and at excessive concentrations causes undesirable tastes in beverages. |
| Conductivity (uS/cm) | | 1 | n/a | 1 | n/a | 07/01-09/30 | 199 | n/a | NO | | Measure of the ability of fluid to carry a charge which is directly related to the concentration of dissolved substances. |
| Chloride (mg/l) | 250 | 1 | n/a | 1 | n/a | 07/01-09/30 | 6.3 | n/a | NO | | Non-toxic material present in small amounts in drinking water and produce a detectable salty taste. |
| Sulphate (mg/l) | 500 | 1 | n/a | 1 | n/a | 07/01-09/30 | 14.4 | n/a | NO | | Above 500 mg/L, it can have a laxative effect, however regular users adapt to the level. Problems occur to visitors only. |
| Total Kjeldahl Nitrogen (mg/l) | | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.49 | n/a | NO | | Represents the nitrogen equivalent available from ammonia and organic nitrogen. |
| Dissolved Organic Carbon (mg/l) | 5 | 1 | n/a | 1 | n/a | 07/01-09/30 | 3 | n/a | NO | | High concentration is an indicator of possible water quality deterioration during storage and distribution due to the carbon being a growth nutrient. |
| Trihalomethanes (mg/l) | 0.1 | 1 | n/a | 1 | n/a | 07/01-09/30 | 0.0054 | n/a | NO | | The principle source of trihalomethanes in drinking water is the action of chlorine with organics left in the water after filtration. |

| Table B Parameters | MAC, IMAC, AO | # of Samples | | # of Detectable Results | | Sampling Date | Range | | Exceed ? | Typical Source of Contaminant |
|----------------------------------|---------------------|-----------------|----|-------------------------------|----|------------------|-------|--------|-------------|---|
| | | R | Tr | R | Tr | | R | Tr | | |
| Trihalomethanes (mg/l) | 0.1 | n/a | 1 | n/a | 1 | 07/01-09/30 | | 0.0337 | NO | The principle source of trihalomethanes in drinking water is the action of chlorine with organics left in the water after filtration. |

| Table D Parameters | MAC, IMAC, AO | # of Samples | # of Detectable Results | Sampling Date | Range | Exceed ? | Typical Source of Contaminant |
|-------------------------|---------------------|-----------------|-------------------------------|------------------|-------|-------------|----------------------------------|
| | | R Tr | R Tr | | R Tr | | |
| * No detectable results | | | | | | | |