**COUNCIL ATTACHMENT 1**

# York Region Drinking Water System Schedule 22 Summary Report

**Mandated under Schedule 22 of the Ministry of the Environment's Drinking Water Systems Regulation (O. Reg. 170/03)**

## 2008 Reporting Year

**Presented to the York Region Transportation and Works Committee and York Regional Council**

## Executive Summary

York Region is responsible for the production, treatment and storage of drinking water to the communities of Georgina, Aurora, East Gwillimbury, Newmarket, Whitchurch-Stouffville, King Township, and parts of the City of Vaughan. York Region is also responsible for the transmission of drinking water from the City of Toronto and the Regional Municipality of Peel to the communities of Richmond Hill, Markham, City of Vaughan, and parts of the Towns of Aurora and Newmarket.

This report has been created to fulfill the requirements outlined in Schedule 22 of the Ministry of the Environment's Drinking Water Systems Regulation O. Reg. 170/03.

This report provides a summary of the individual drinking water systems and a series of figures on the 2008 pumping history for each individual well and system in York Region. In 2008, all of York Region's Drinking Water Systems met the withdrawal limits imposed by its Permits to Take Water (PTTW).

In 2008, 10 of 37 production wells experienced short-term incidents where instantaneous peak flow rates exceeded the Permit To Take Water limits. Water production wells may experience brief flow spikes (typically, less than five minutes) where the instantaneous flow rate exceed the Permit To Take Water limits. Flow spikes are generally associated with start-up of the production wells. The Ministry of Environment is satisfied that any short-term flow spikes recorded at York Region production wells are expected and do not pose a compliance issue. The peak flows over the PTTW limit are identified in each of the '*Daily Instantaneous Peak Flow'* graphs.

The total maximum daily average of water supplied from Peel to the York Water System for the reporting period of January 1 – December 31, 2008 was 72,304,917 litres per day. The system operated at 1.04% above the maximum permitted withdrawal as prescribed in the operating agreement. This increase in withdrawal resulted from annual maintenance conducted on the production wells which increased the system demand for the Aurora water supply. Higher precipitation in 2008 also contributed to lower than average withdrawal volumes from the Aurora water supply and surrounding water supply systems. Operating above the maximum permitted withdrawal is acceptable and is not classified as a regulatory exceedence as prescribed in the operating agreement when agreed upon between York Region and the Region of Peel.

A summary of the findings for each drinking water system are presented in Table E1.

## TABLE E1: York Region Drinking Water System Compliance Summary

| Water Supply | Met Limits Imposed By The PTTW |
|---|---|
| Ansnorveldt | Withdrawal below allowable limit<br>*Instantaneous peak flow rates recorded above allowable limit* |
| Aurora | Withdrawal below allowable limit<br>*Instantaneous peak flow rates recorded above allowable limit* |
| Ballantrae | Withdrawal below allowable limit |
| Georgina | Withdrawal below allowable limit |
| Keswick | Withdrawal below allowable limit |
| King City | Withdrawal below allowable limit |
| Kleinburg | Withdrawal below allowable limit<br>*Instantaneous peak flow rates recorded above allowable limit* |
| Mount Albert | Withdrawal below allowable limit |
| Newmarket/<br>East Gwillimbury | Withdrawal below allowable limit<br>*Instantaneous peak flow rates recorded above allowable limit* |
| Nobleton | Withdrawal below allowable limit |
| Schomberg | Withdrawal below allowable limit |
| Stouffville | Withdrawal below allowable limit<br>*Instantaneous peak flow rates recorded above allowable limit* |
| Yonge Street Aquifer | Withdrawal below allowable limit |
| York Water System | Withdrawal below allowable limit |
| Toronto Water Supply | Withdrawal below allowable limit |
| Peel Water Supply | *Withdrawal above allowable limit* |

There have been no Provincial Orders issued by the Ministry of the Environment under the *Safe Drinking Water Act (2002)* or the Ontario Regulation 170/03 for the period of January 1 – December 31, 2008.

# Table of Contents

# List of Tables

# List of Tables

# List of Figures

# List of Figures

## Introduction

The purpose of the Summary Report is to provide an understanding of the Regional Municipality of York's (York Region) drinking-water system status and capacities for the reporting period of January 1 – December 31, 2008. It has been created to fulfill the requirements mandated under Schedule 22 of the Ministry of the Environment's Drinking Water Systems Regulation, Ontario Regulation 170/03.

The Annual Water Quality Report, which details the quality of York Region's drinking water, has been completed separately to fulfill the requirements of Section 11 of Ontario Regulation 170/03. This report will be available on request through the Environmental Services Department, available on-line through the York Region website, as well as distributed to the local area municipalities serviced by the water system after February 28th, 2009.

# 2.0 Drinking-Water Systems Information

## 2.1 Ansnorveldt

York Region operates a water supply system to service Ansnorveldt, Township of King, under authority of a Certificate of Approval (C of A) issued by the Ontario Ministry of the Environment (MOE). The C of A includes reference to the valid Permit to Take Water (PTTW) also issued by the MOE. Details of the C of A and PTTW and other relevant classification information are presented in Table 1. All system upgrades required by the C of A have been completed.

### TABLE 1: Ansnorveldt Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 4234-6VJPWK<br>January 15, 2007 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 02-P-3050<br>June 21, 2002<br>March 31, 2012 |
| **MOE Waterworks Number:** | 260002213 |
| **System Classification:** | Water Distribution II (WD II) |

### 2.1.1 Water Taking

The PTTW for the Ansnorveldt Water Supply System allows York Region to withdraw up to 285,120 litres per day from production wells 1 and 2.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis by SCADA to ensure that the regulated flows are not exceeded.

### 2.1.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.

2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.1.3 Water Withdrawal

The total volume of water taken from the production wells of the Ansnorveldt Water Supply system for the reporting period of January 1 – December 31, 2008 was 17,303,310 litres or 47,276 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 2.

**TABLE 2: Permitted and Actual Maximum Daily Withdrawal from the Ansnorveldt Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 1 | 100,800 | 42,498 – July 12, 2008 | 42.2% |
| Well 2 | 184,320 | 84,324 – July 23, 2008 | 45.7% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 3.

**TABLE 3: Permitted and Actual Maximum Withdrawal from the Ansnorveldt Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 104,068,800 | 17,303,310 | 16.6% |

The monthly average flows, the maximum daily withdrawals, and the permitted daily withdrawal for the reporting period of January 1 – December 31, 2008 are shown in Figures 1 and 2.

**Figure 1: Ansnorveldt Well No. 1**
**Monthly Average Flow and Monthly Maximum Flow 2008**

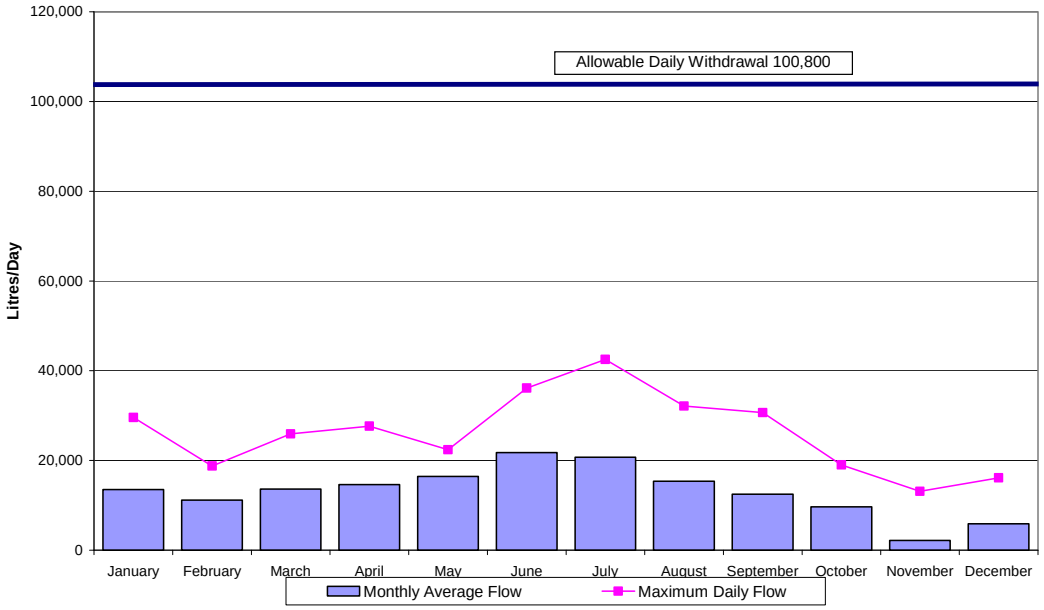
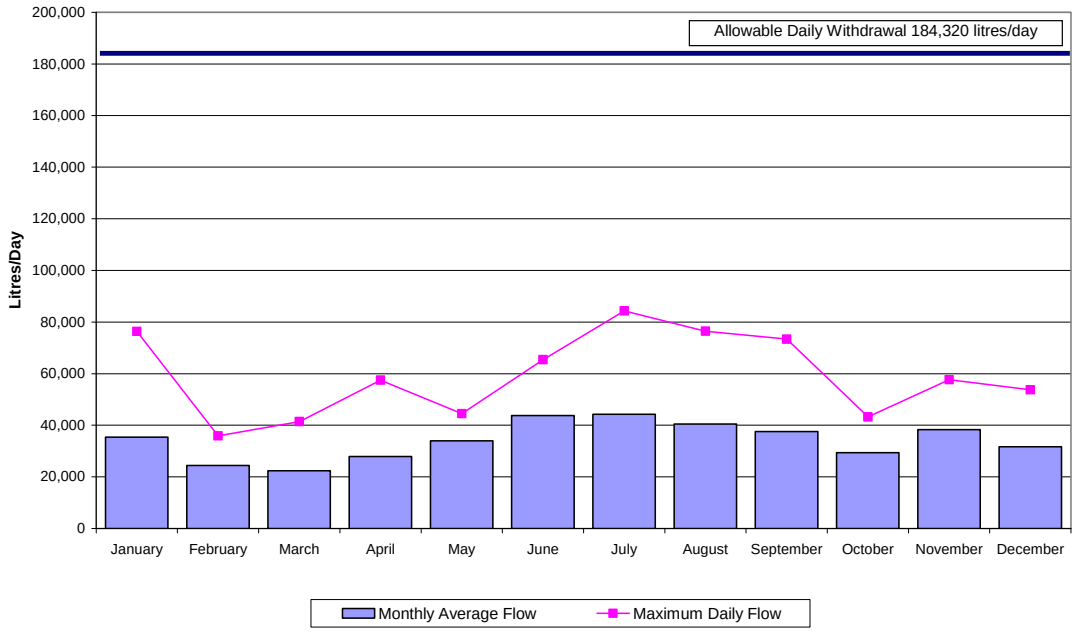



**Figure 2: Ansnorveldt Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**




The actual volumes of water taken from the Ansnorveldt production wells during January 1 – December 31, 2008 did not exceed the permitted daily withdrawal volumes.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 3 and 4.

**Figure 3: Ansnorveldt Well No. 1**
**Daily Instantaneous Peak Flow 2008**

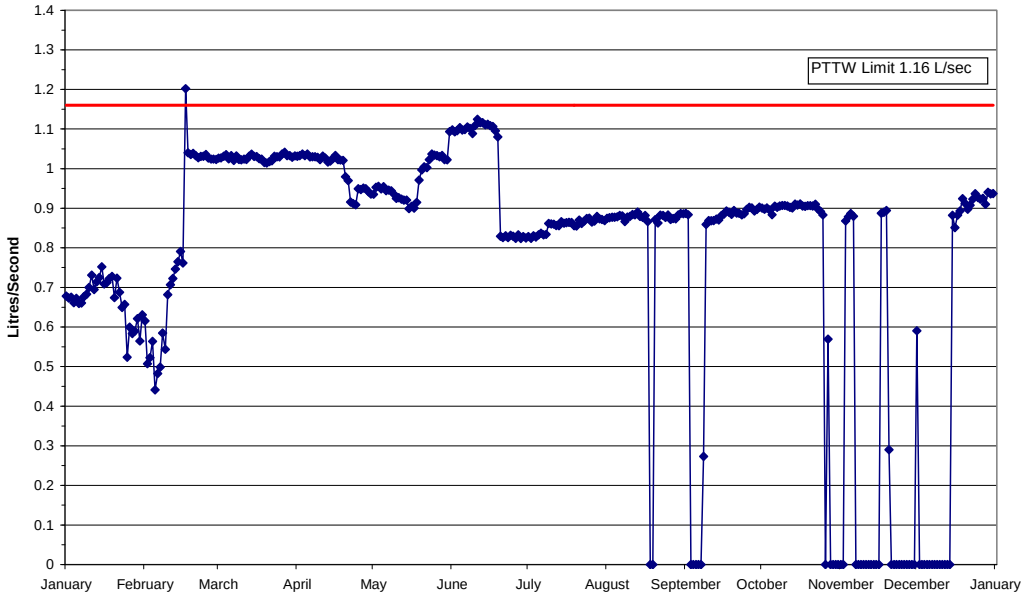



**Figure 4: Ansnorveldt Well No. 2**
**Daily Instantaneous Peak Flow 2008**

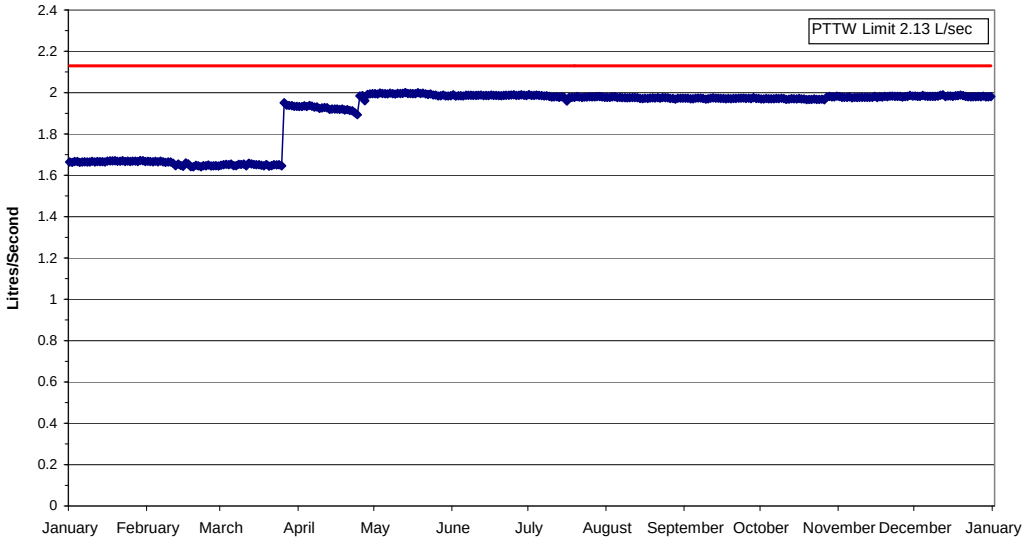



Figure 3 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure, a change in the distribution system pressure or maintenance on the distribution system. Scheduled operational maintenance contributed to the reduction of the peak flow rates, improving the overall operations of the water system.

## 2.2 Aurora

York Region operates a water supply system to service the Town of Aurora under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Aurora Water Supply are presented in Table 4. All system upgrades required by the C of A have been completed.

### TABLE 4: Aurora Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 3914-77WNG5<br>October 25, 2007 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 6623-68QQ6L<br>March 10, 2005<br>March 31, 2015 |
| **MOE Waterworks Number:** | 220002440 |
| **System Classification:** | Water Distribution & Supply III (WDS III) |

### 2.2.1 Water Taking

The PTTW for the Aurora Water Supply System allows York Region to withdraw up to 31,618,944 litres per day from all production wells.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.2.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.

2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored

electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.2.3 Water Withdrawal

The total volume of water taken from the production wells of the Aurora Water Supply system for the reporting period of January 1 – December 31, 2008 was 2,105,363,672 litres or 5,752,360 litres per day.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 5.

**TABLE 5: Permitted and Actual Maximum Daily Withdrawal from the Aurora Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Daily Withdrawal During Peak Demand |
|---|---|---|---|
| Well 1 | 3,273,120 | 3,015,000 – April 2, 2008 | 92.1% |
| Well 2 | 5,891,760 | 4,322,000 – October 11, 2008 | 73.3% |
| Well 3 | 5,237,136 | 3,621,000 – October 7, 2008 | 69.1% |
| Well 4 | 7,855,632 | 5,518,000 – May 10, 2008 | 70.2% |
| Well 5 | 5,891,760 | 4,984,938 – January 5, 2008 | 84.6% |
| Well 6 | 3,469,536 | 1,544,891 – May 6, 2008 | 44.5% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 6.

**TABLE 6: Permitted and Actual Maximum Withdrawal from the Aurora Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 11,540,914,560 | 2,105,363,672 | 18.2% |

Table 6 shows a low percentage of permitted withdrawal of 18.2%. This reduction in withdrawal occurred due to scheduled maintenance on production wells 1 to 4 and 6. To accommodate this work and meet system demand, additional water was supplied through York Regions connection to the Region of Peels lake based water supply system. Higher precipitation in 2008 also contributed to lower than average withdrawal volumes from the Aurora water supply and surrounding water supply systems.

The monthly average flows, the maximum daily withdrawals, and the permitted daily withdrawal for the reporting period of January 1 – December 31, 2008 are shown in Figures 5 through 10.

**Figure 5: Aurora Well No. 1**
**Monthly Average Flow and Maximum Daily Flow 2008**

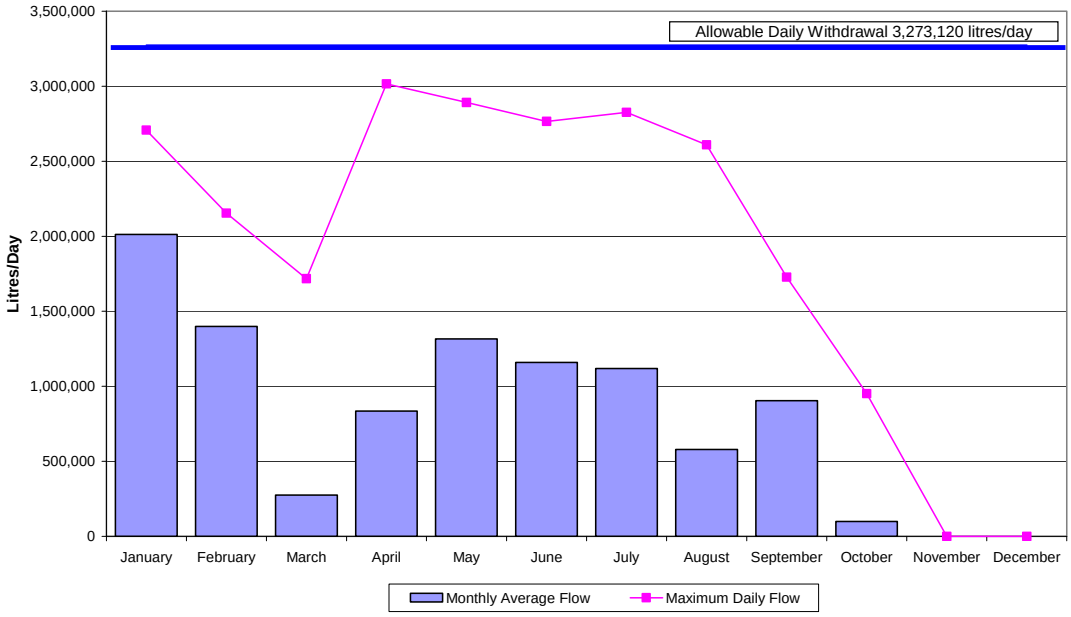



Figure 5 shows a reduced monthly average flow or no monthly average flow recorded for the month of November and December 2008. This reduction in flow occurred due to scheduled maintenance conducted on the well to improve the overall operation of the water system.

**Figure 6: Aurora Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

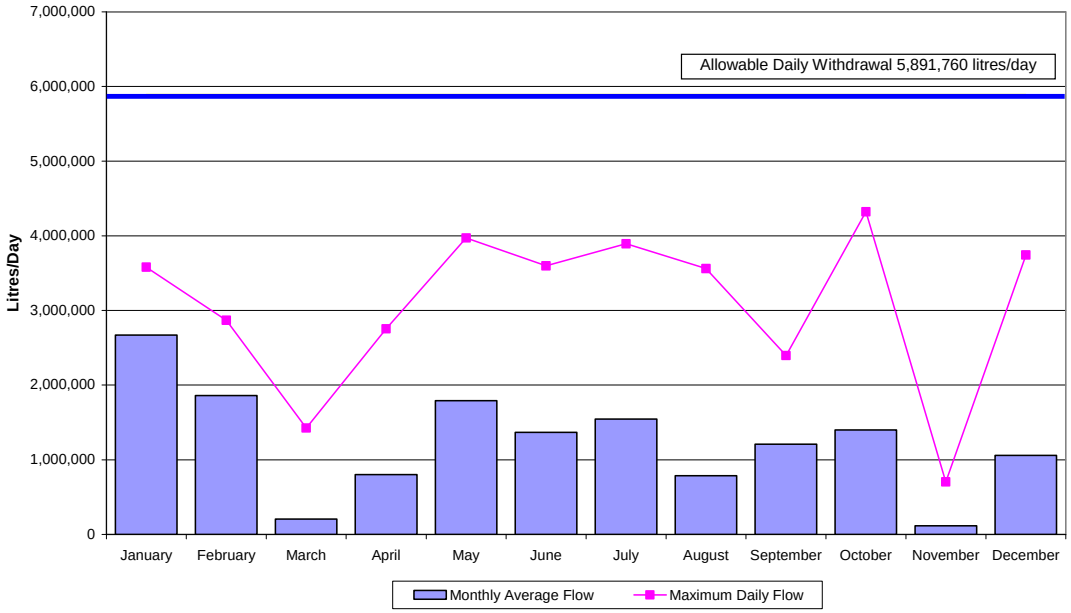


**Figure 7: Aurora Well No. 3**
**Monthly Average Flow and Maximum Daily Flow 2008**

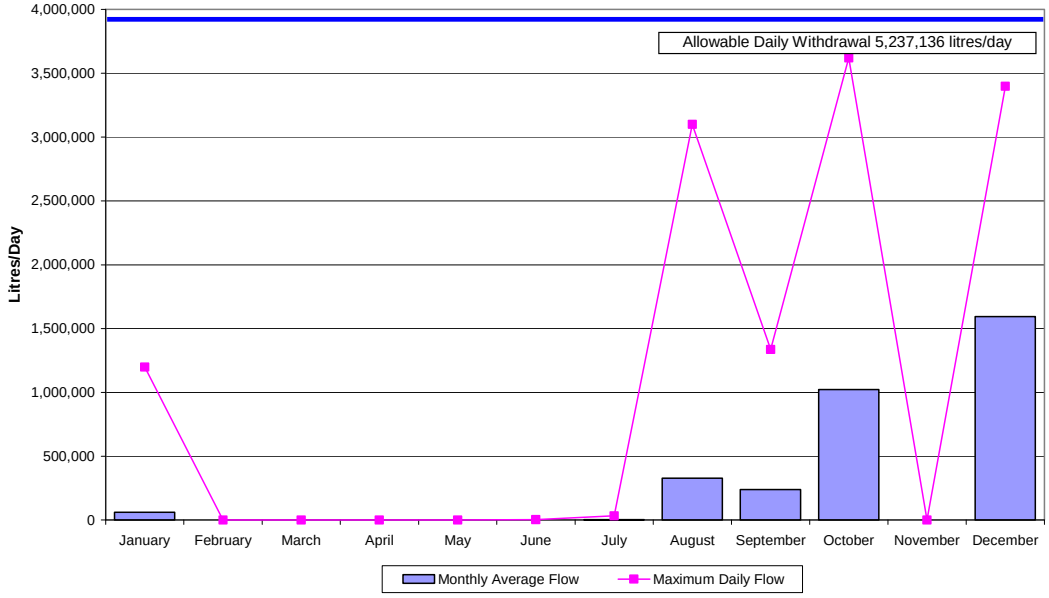



Figure 7 shows reduced monthly average flow or no monthly average flow recorded for the month of February to July and November 2008 and Figure 8 for the months of September to November. This reduction in flow occurred due to scheduled maintenance conducted on the well to improve the overall operation of the water system.

**Figure 8: Aurora Well No. 4**
**Monthly Average Flow and Maximum Daily Flow 2008**

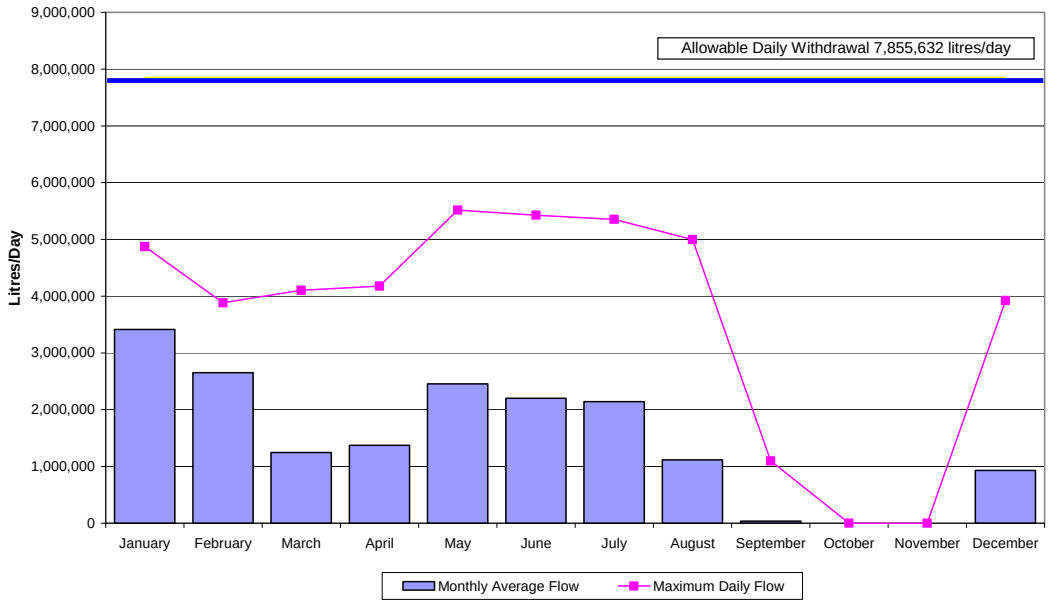


**Figure 9: Aurora Well No. 5**
**Monthly Average Flow and Maximum Daily Flow 2008**

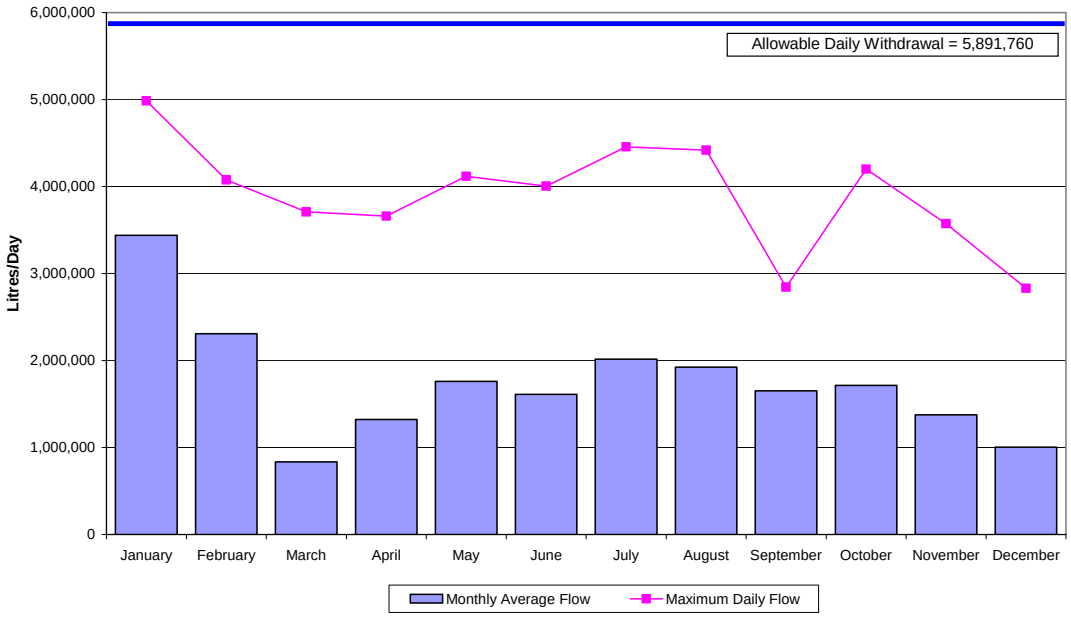



**Figure 10: Aurora Well No. 6**
**Monthly Average Flow and Maximum Daily Flow 2008**

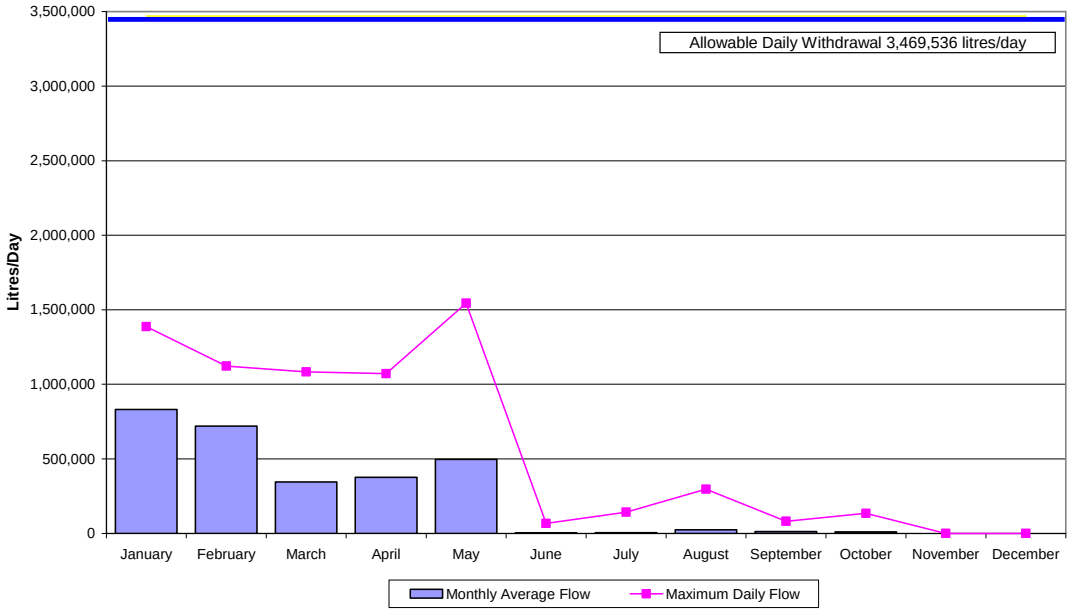



Figure 10 shows a reduced monthly average flow or no monthly average flow recorded for the month of June to December 2008. This reduction in flow occurred due to scheduled maintenance conducted on the well to improve the overall operation of the water system.

Actual volumes of water taken from the Aurora production wells during January 1 – December 31, 2008 did not exceed the permitted daily withdrawal.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 11 through 16.

**Figure 11: Aurora Well No. 1**
**Daily Instantaneous Peak Flow 2008**

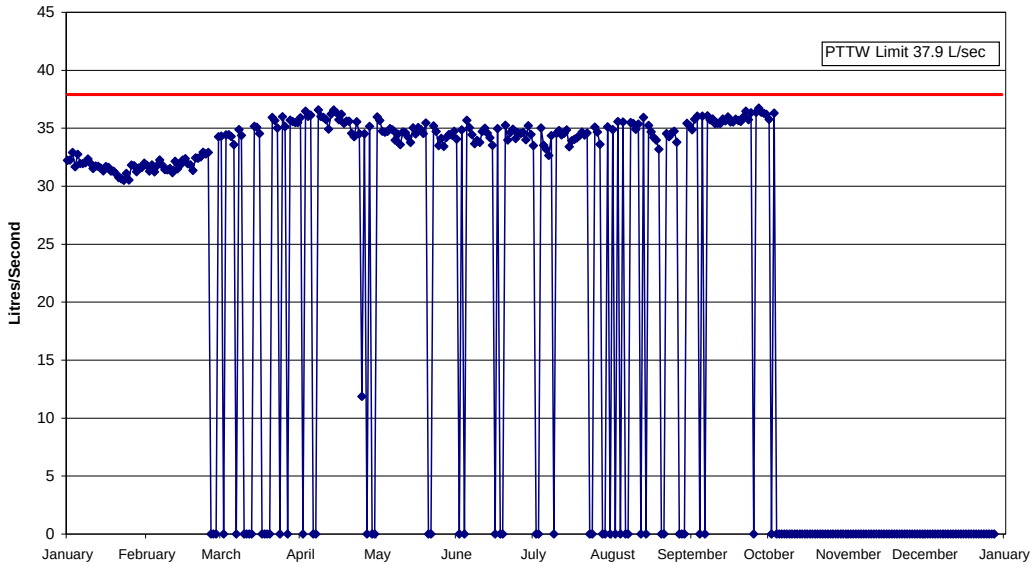



**Figure 12: Aurora Well No. 2**
**Daily Instantaneous Peak Flow 2008**

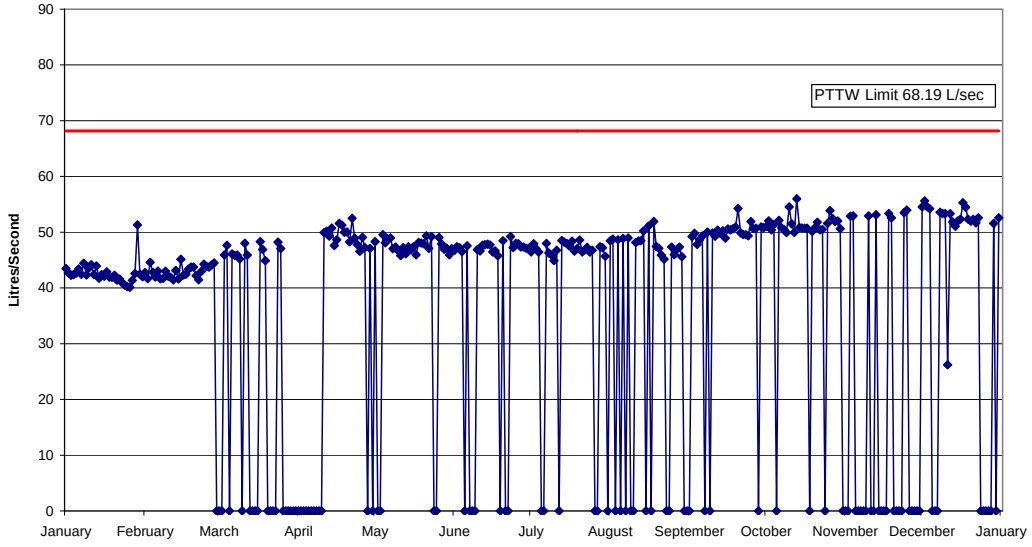


**Figure 13: Aurora Well No. 3**
**Daily Instantaneous Peak Flow 2008**

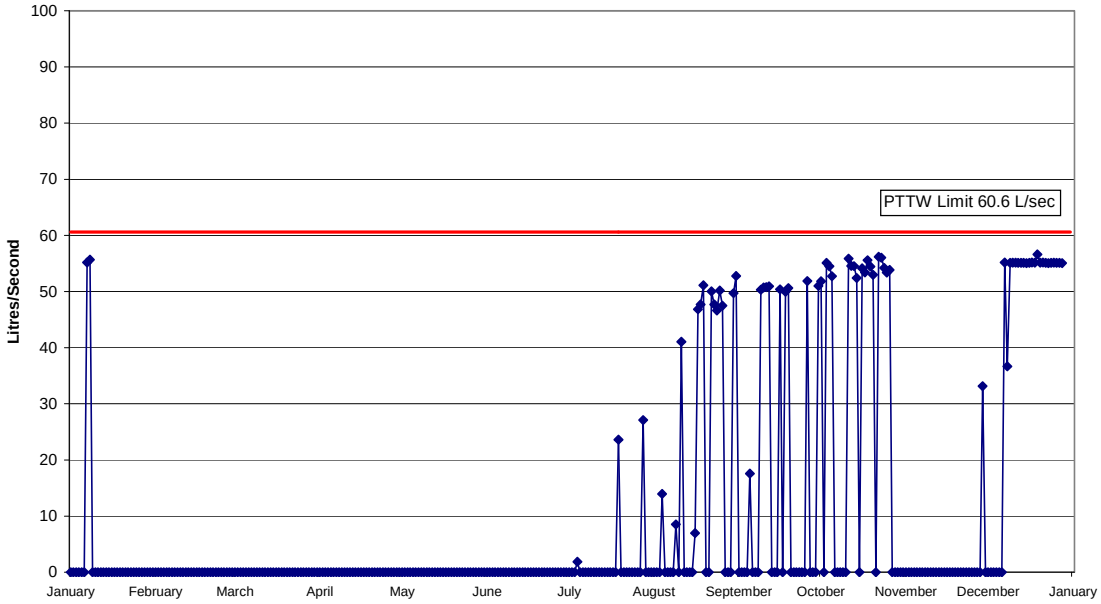



**Figure 14: Aurora Well No. 4**
**Daily Instantaneous Peak Flow 2008**

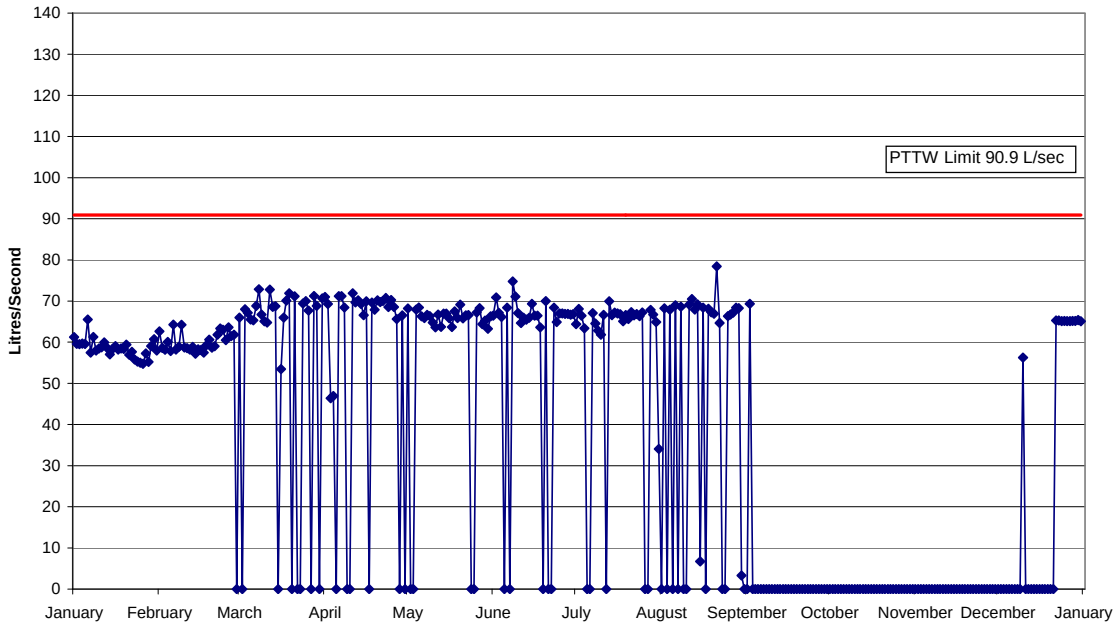


**Figure 15: Aurora Well No. 5**
**Daily Instantaneous Peak Flow 2008**

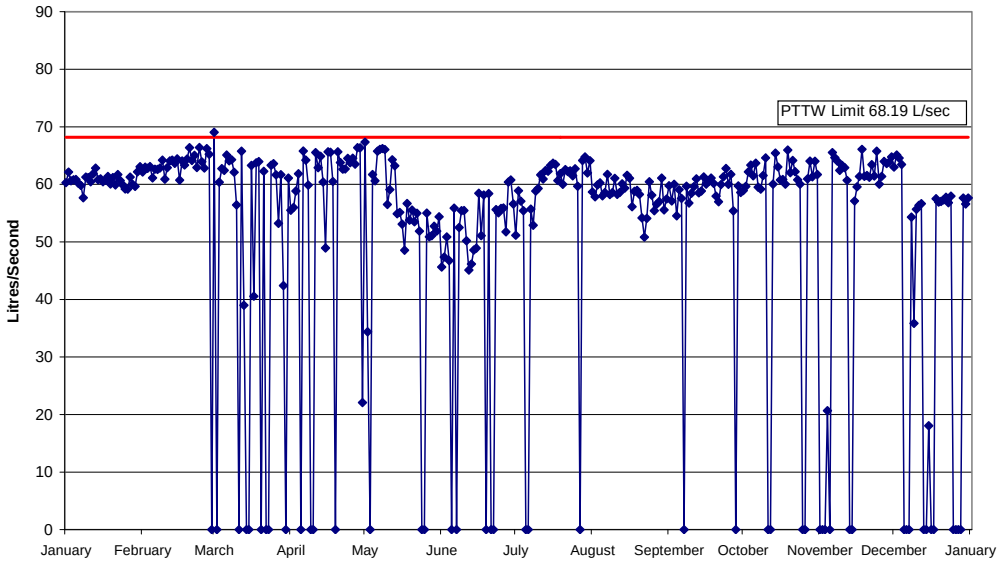
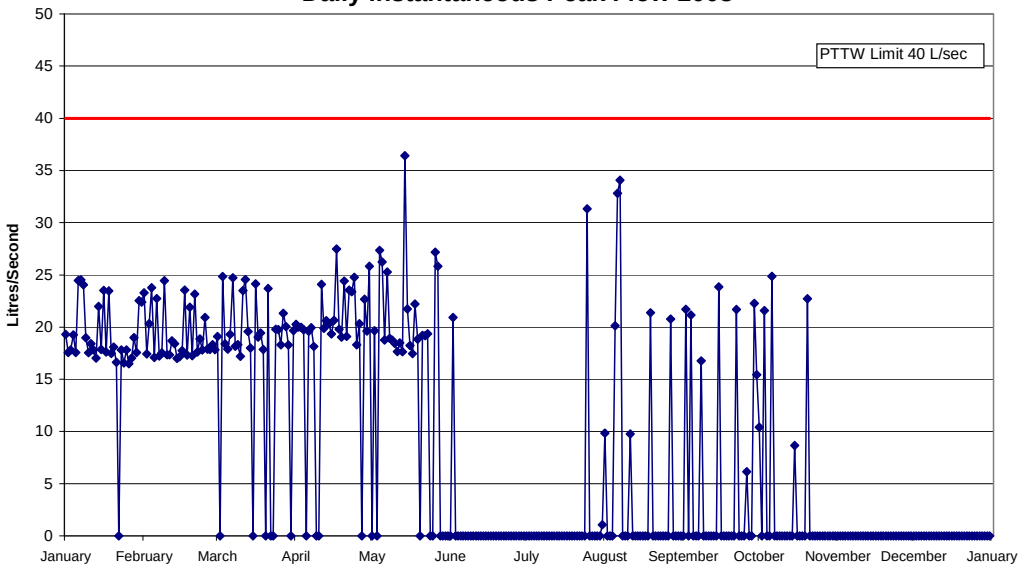



Figure 15 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure, a change in the distribution system pressure or maintenance on the distribution system. Scheduled operational maintenance contributed to the reduction of the peak flow rates, improving the overall operations of the water system.

**Figure 16: Aurora Well No. 6**
**Daily Instantaneous Peak Flow 2008**



## 2.3 Ballantrae

York Region operates a water supply system to service Ballantrae/Musselman's Lake, Town of Whitchurch-Stouffville, under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Ballantrae/Musselmans's Lake Water Supply are presented in Table 7. All system upgrades required by the C of A have been completed.

### TABLE 7: Ballantrae/Musselman's Lake Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 1844-7B5U9A<br>February 28, 2008 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date**:** | 4545-7EMR9W<br>March 16, 2008<br>March 31, 2013 |
| **MOE Waterworks Number:** | 220008658 |
| **System Classification:** | Water Distribution & Supply II (WDSII) |

### 2.3.1 Water Taking

The PTTW for the Ballantrae/Musselman's Lake Water Supply System allows York Region to withdraw up to 2,647,920 litres per day from production wells 1 or 2 with a maximum combined total permitted withdrawal of 4,580,000 litres per day.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that regulated flows are not exceeded.

### 2.3.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This 'manual' data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored

electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.3.3. Water Withdrawal

The total volume of water taken from the production wells of the Ballantrae/Musselman's Lake Water Supply system for the reporting period of January 1 – December 31, 2008 was 386,860,813 litres or 1,056,996 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 8.

**TABLE 8: Permitted and Actual Maximum Daily Withdrawal from the Ballantrae/Musselman's Lake Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 1 | 2,647,920 | 2,159,313 – June 25 2008 | 81.5% |
| Well 2 | 2,647,920 | 2,163,813 – May 27, 2008 | 81.7% |
| Well 1 & 2 | 4,580,000 | 2,584,750 – October 20, 2008 | 56.4% |

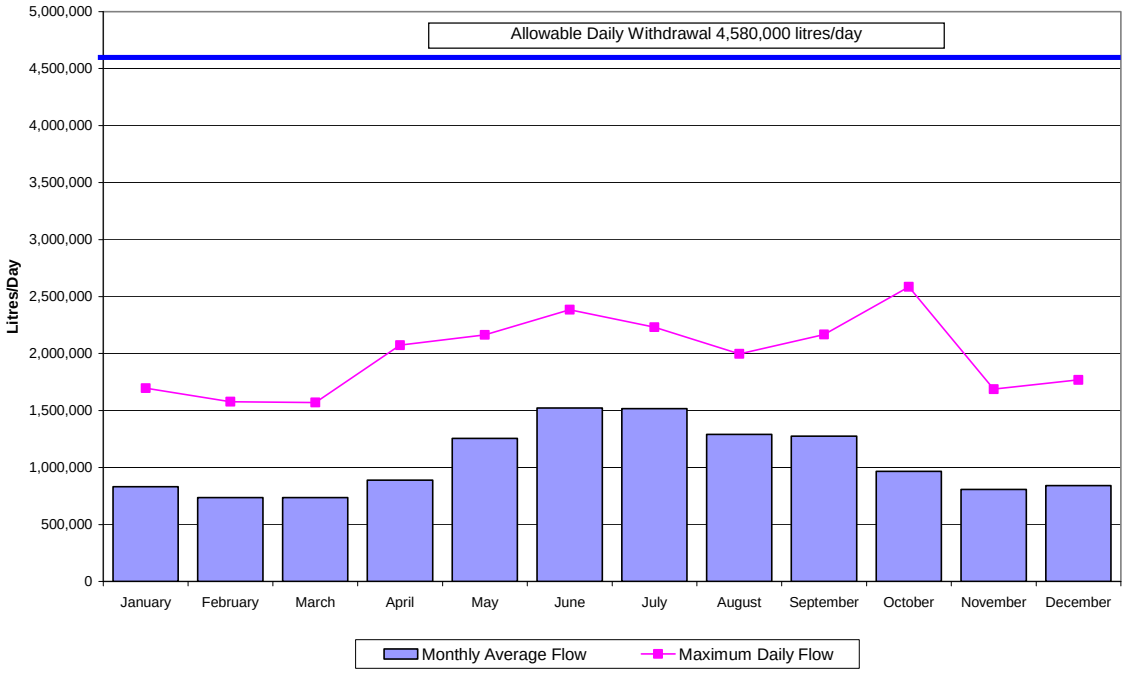
The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 9.

**TABLE 9: Permitted and Actual Maximum Withdrawal from the Ballantrae/Musselman's Lake Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 1,598,875,200 | 386,860,813 | 24.1% |

The average monthly flow rates, maximum daily flow, and the permitted daily withdrawal are presented in Figure 17.

**Figure 17: Ballantrae Wells No. 1 & 2**
**Monthly Average Flow and Maximum Daily Flow 2008**




The actual volume of water taken from the Ballantrae/Musselman's production wells during January 1 – December 31, 2008 did not exceed the permitted daily withdrawal volume.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 18 and 19.

**Figure 18: Ballantrae Well No. 1**
**Daily Instantaneous Peak Flow 2008**

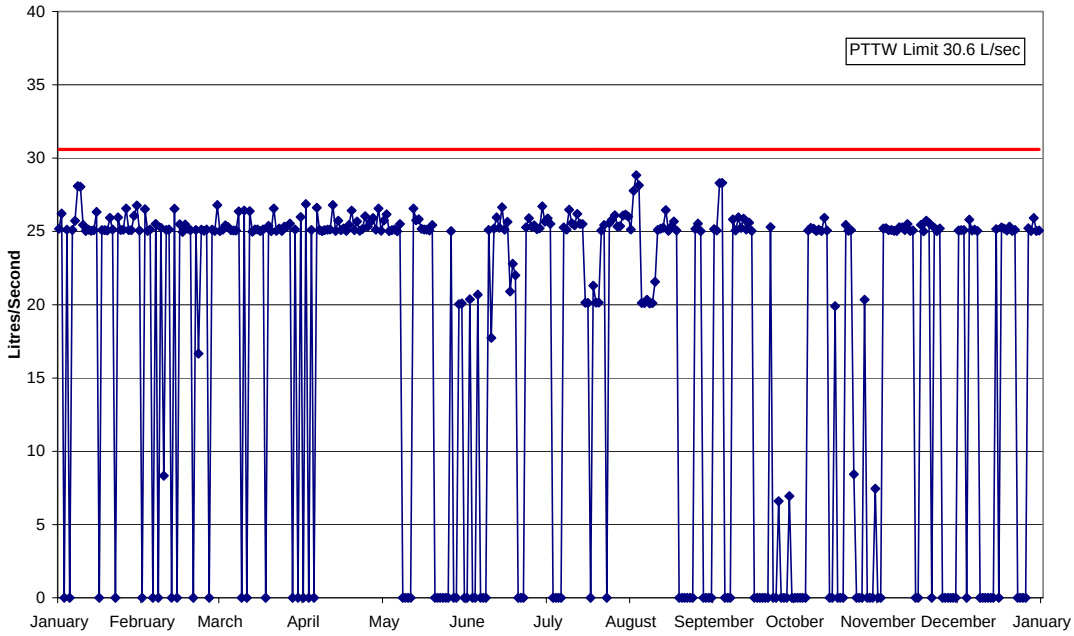
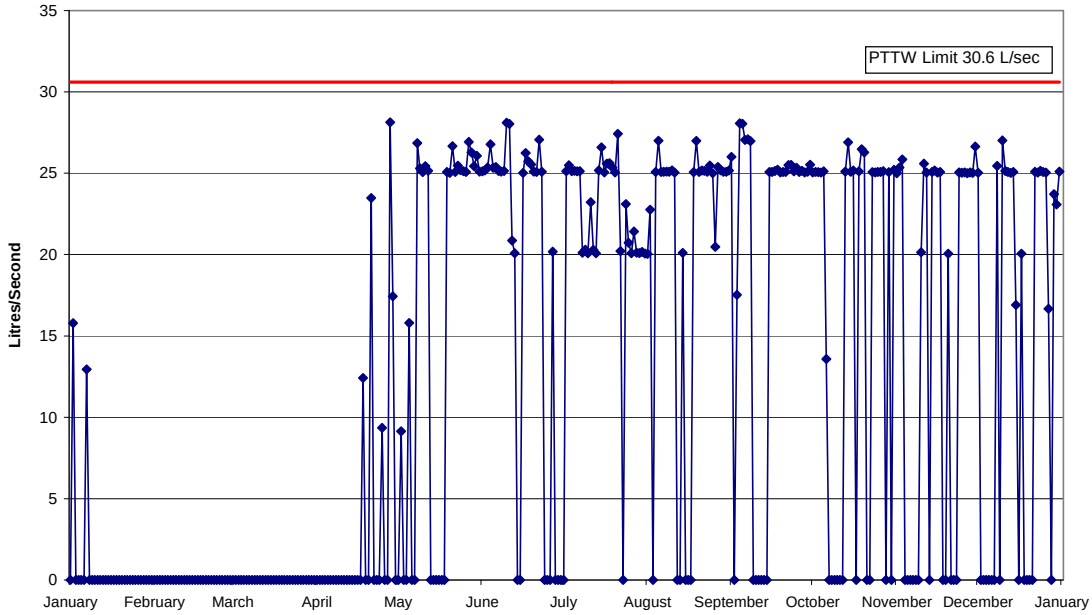



**Figure 19: Ballantrae Well No. 2**
**Daily Instantaneous Peak Flow 2008**



## 2.4 Georgina

The Regional Municipality of York (York Region) operates a water supply system to service the communities of Sutton and Keswick, Town of Georgina, under authority of a C of A issued by the MOE. The C of A includes reference to the valid PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Georgina Water Supply are presented in Table 10. All system upgrades required by the C of A have been completed.

### TABLE 10: Georgina Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificates of Approval Numbers:**<br>Issue Date: | 5640-667R8N<br>December 8, 2004 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 03-P-3008<br>February 12, 2003<br>February 28, 2013 |
| **MOE Waterworks Number:** | 260026156 |
| **System Classification:** | Water Treatment II (WT II) |

### 2.4.1 Water Taking

The PTTW for the Georgina Water Supply System allows York Region to withdraw up to 49,999,680 litres per day from the water treatment plant.

York Region monitors the water taking through flow meters. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.4.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters have recently been connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.4.3 Water Withdrawal

The total volume of water from the Georgina water treatment plant during January 1 – December 31, 2008 was 2,222,801,963 litres or 6,073,229 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 11.

**TABLE 11: Permitted and Actual Maximum Daily Withdrawal from the Georgina Water Treatment Plant for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Water Treatment Plant | 49,999,680 | 12,866,438 – August 24, 2008 | 25.7% |

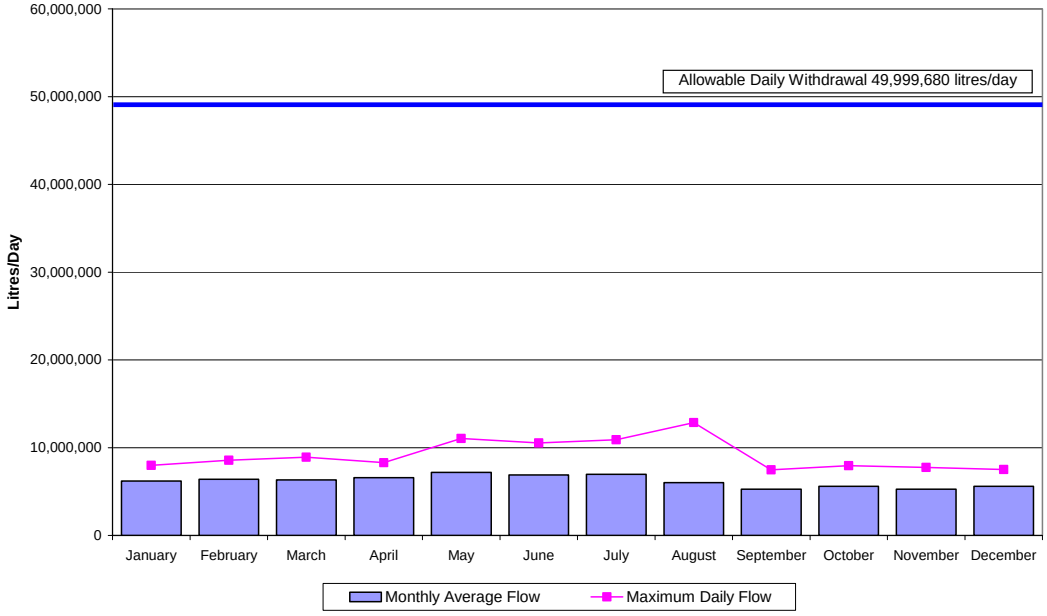
The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 12.

**TABLE 12: Permitted and Actual Maximum Withdrawal from the Georgina Water Treatment Plant for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 18,249,883,200 | 2,222,801,963 | 12.2% |

The monthly average flows, the maximum daily withdrawals, and the permitted daily withdrawal for the reporting period of January 1 – December 31, 2008 are shown in Figure 20.

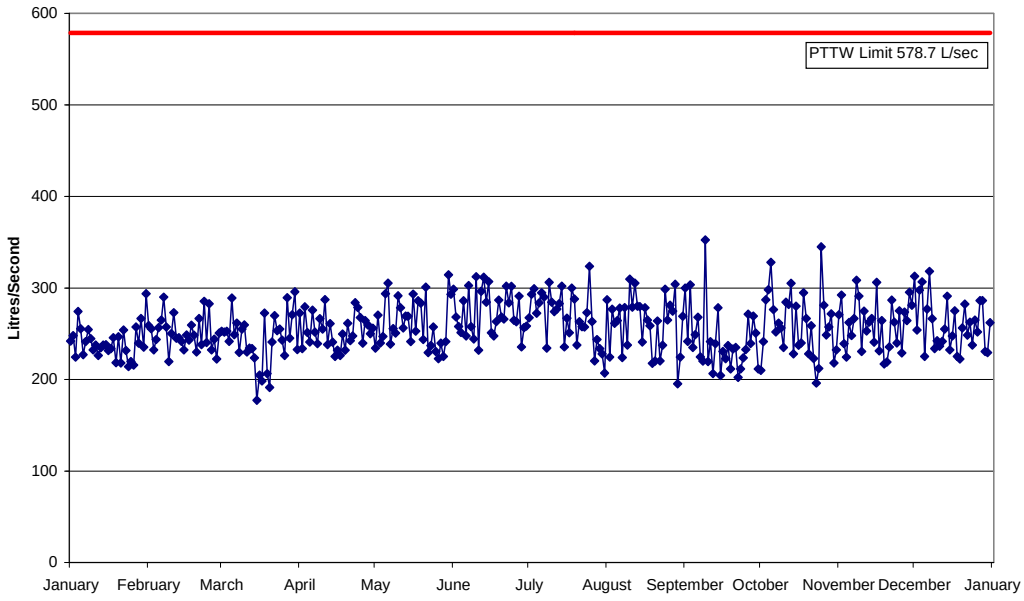
**Figure 20: Georgina Water Treatment Plant**
**Monthly Average Flow and Maximum Daily Flow 2008**




The withdrawal rates from the Georgina Water Treatment Plant did not exceed the permitted limits for January 1 – December 31, 2008.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 is presented in Figure 21.

**Figure 21: Georgina Water Treatment Plant**
**Daily Instantaneous Peak Flow 2008**



## 2.5 Keswick

The Regional Municipality of York (York Region) operates a water supply system to service Keswick, Town of Georgina, under authority of a C of A issued by the MOE. The C of A includes reference to the valid PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Keswick Water Supply are presented in Table 13. All system upgrades required by the C of A have been completed.

### TABLE 13: Keswick Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificates of Approval Numbers:**<br>Issue Date: | 3684-6GNPMV<br>October 19, 2005 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 1268-636QNK<br>July 30, 2004<br>June 30, 2014 |
| **MOE Waterworks Number:** | 210003280 |
| **System Classification:** | Water Treatment III (WT III) |

### 2.5.1 Water Taking

The PTTW for the Keswick Water Supply System allows York Region to withdraw up to 16,200,000 litres per day from the water treatment plant.

York Region monitors the water taking through flow meters. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.5.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.5.3 Water Withdrawal

The total volume of water from the Keswick water treatment plant during January 1 – December 31, 2008 was 1,194,289,995 litres or 3,263,087 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 14.

**TABLE 14: Permitted and Actual Maximum Daily Withdrawal from the Keswick Water Treatment Plant for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Water Treatment Plant | 16,200,000 | 6,157,375 – July 19, 2008 | 38.0% |

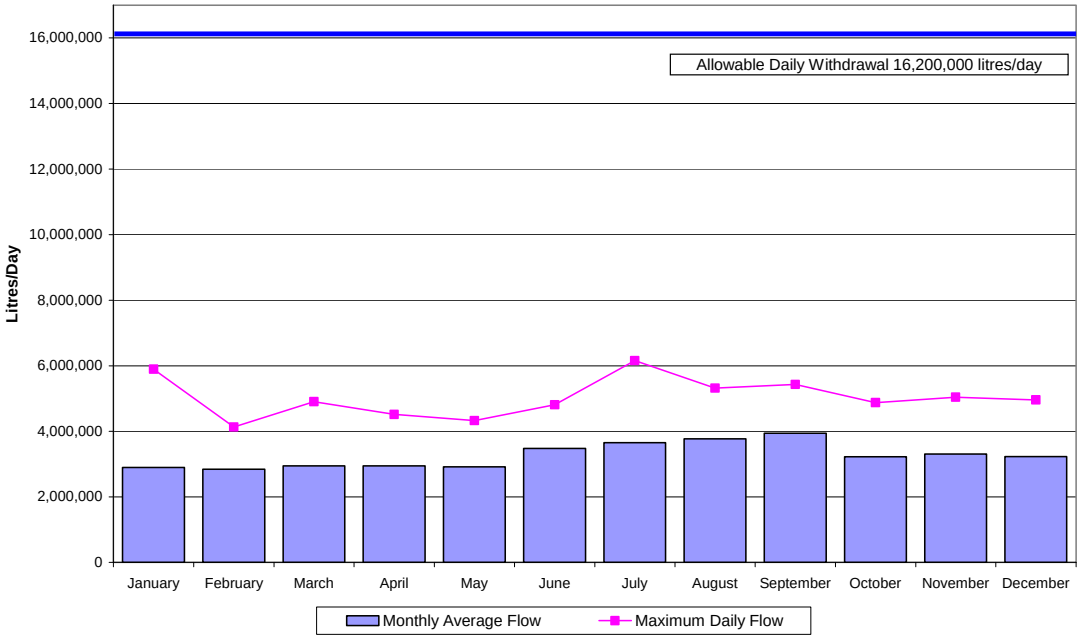
The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 15.

**TABLE 15: Permitted and Actual Maximum Withdrawal from the Keswick Water Treatment Plant for January 1 – December 31, 2008**

| Annual Permitted Withdrawal | Actual Annual Withdrawal | Percentage of Permitted Withdrawal |
|---|---|---|
| 5,913,000,000 | 1,194,289,995 | 20.2% |

The monthly average flows, the maximum daily withdrawals, and the permitted daily withdrawal for the reporting period of January 1 – December 31, 2008 are shown in Figure 22.

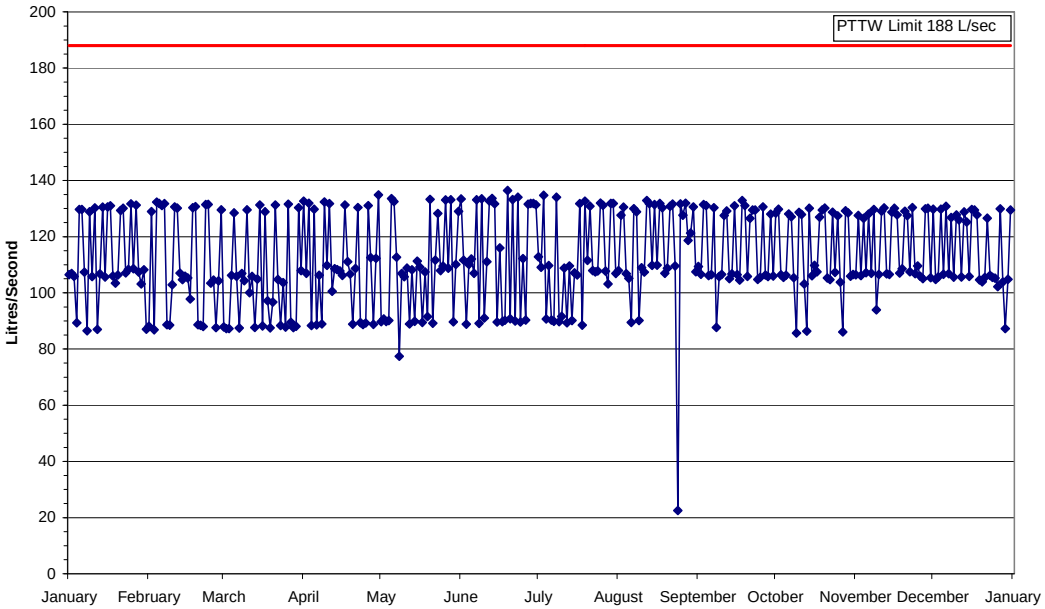
**Figure 22: Keswick Water Treatment Plant**
**Monthly Average Flow and Maximum Daily Flow 2008**




Withdrawal rates from the Keswick Water Treatment Plant did not exceed the permitted limits during January 1 – December 31, 2008.

The '*Daily Instantaneous Peak Flow (litres)*' for January 1- December 31, 2008 is presented in Figure 23.

**Figure 23: Keswick Water Treatment Plant**
**Daily Instantaneous Peak Flow 2008**



## 2.6 King City

York Region operates a water supply system to service King City, Township of King, under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the King City Water Supply are presented in Table 16. All system upgrades required by the C of A have been completed.

### TABLE 16: King City Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 2110-69HKRC<br>April 1, 2005 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 8634-67HR9L<br>December 20, 2004<br>January 31, 2015 |
| **MOE Waterworks Number:** | 220002299 |
| **System Classification:** | Water Distribution & Supply II (WDS II) |

### 2.6.1 Water Taking

The PTTW for the King City Water Supply System allows York Region to withdraw up to 1,963,915 litres per day from production well 3 and 2,618,554 litres per day from production well 4.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.6.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored

electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.6.3 Water Withdrawal

The total volume of water taken from the production wells of the King City Water Supply system for January 1 – December 31, 2008 was 496,319,543 litres or 1,356,064 litres per day.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 17.

**TABLE 17: Permitted and Actual Maximum Daily Withdrawal from the King City Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 3 | 1,963,915 | 1,729,969 – December 8, 2008 | 88.1% |
| Well 4 | 2,618,554 | 2,410,063 – April 30, 2008 | 92.0% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 18.

**TABLE 18: Permitted and Actual Maximum Withdrawal from the King City Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 1,672,601,550 | 496,319,543 | 29.7% |

The monthly average flow rates, maximum daily flow, and the permitted daily withdrawal are presented in Figures 24 and 25.

**Figure 24: King City Well No. 3**
**Monthly Average Flow and Maximum Daily Flow 2008**

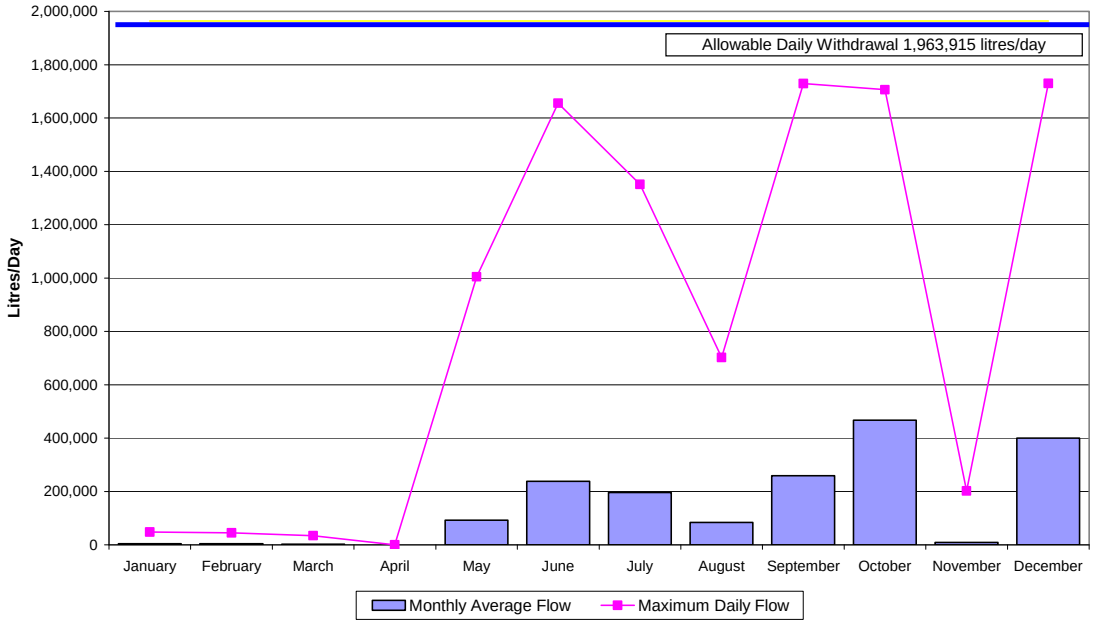
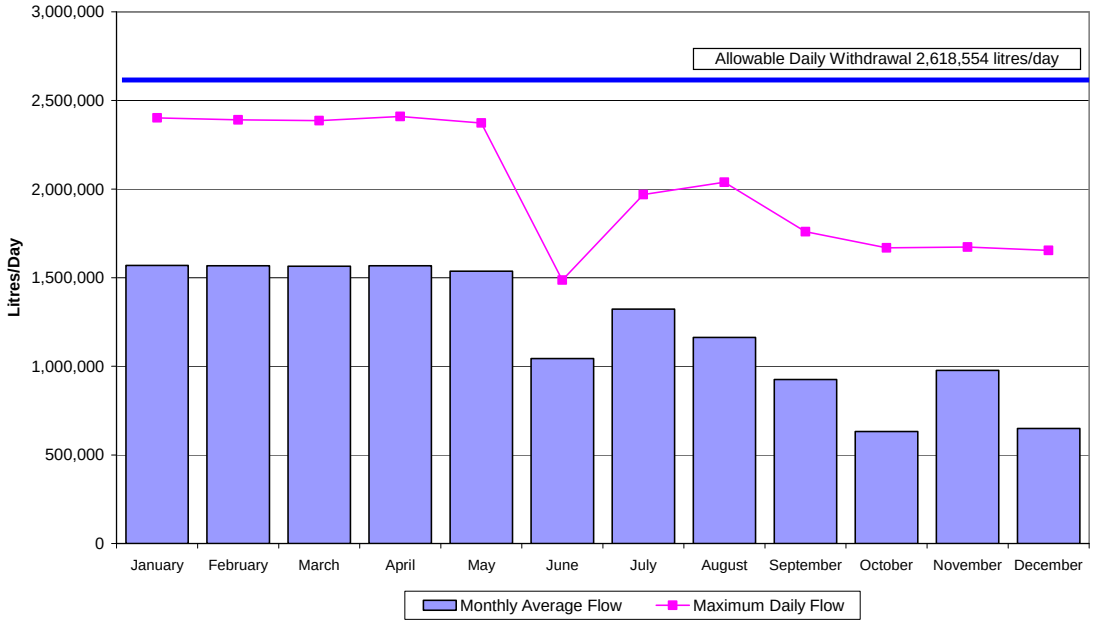



Figure 24 shows a reduced monthly average flow or no monthly average flow recorded for the months of January to April and November 2008. This reduction in flow is representative of the scheduled and unscheduled maintenance conducted on the well annually as part of improving the overall operations of the water system.

**Figure 25: King City Well No. 4**
**Monthly Average Flow and Maximum Daily Flow 2008**



Withdrawal rates from the King City production wells did not exceed the permitted limits during January 1 – December 31, 2008.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 26 and 27.

**Figure 26: King City Well No. 3**
**Daily Instantaneous Peak Flow 2008**

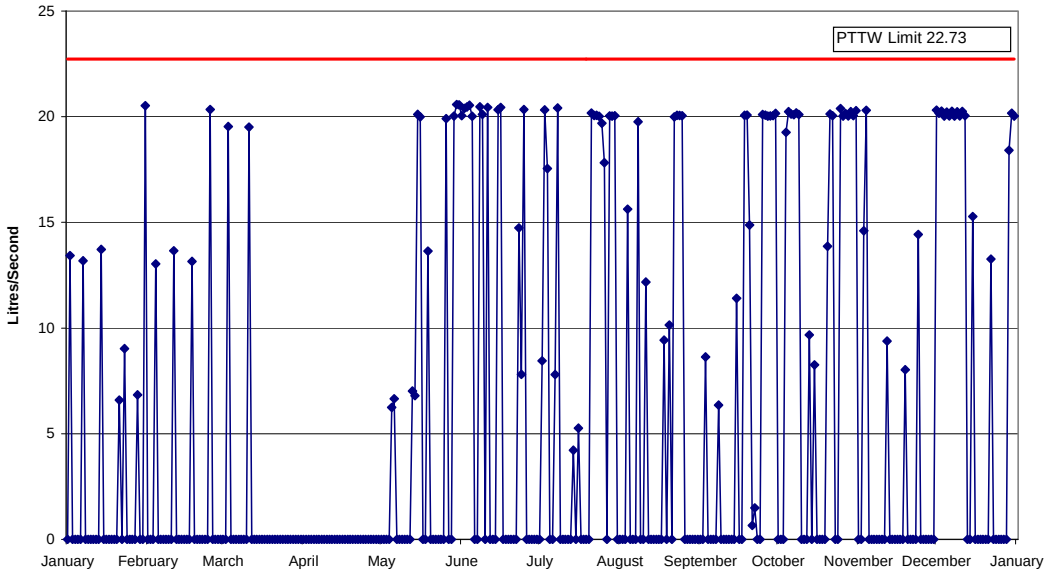
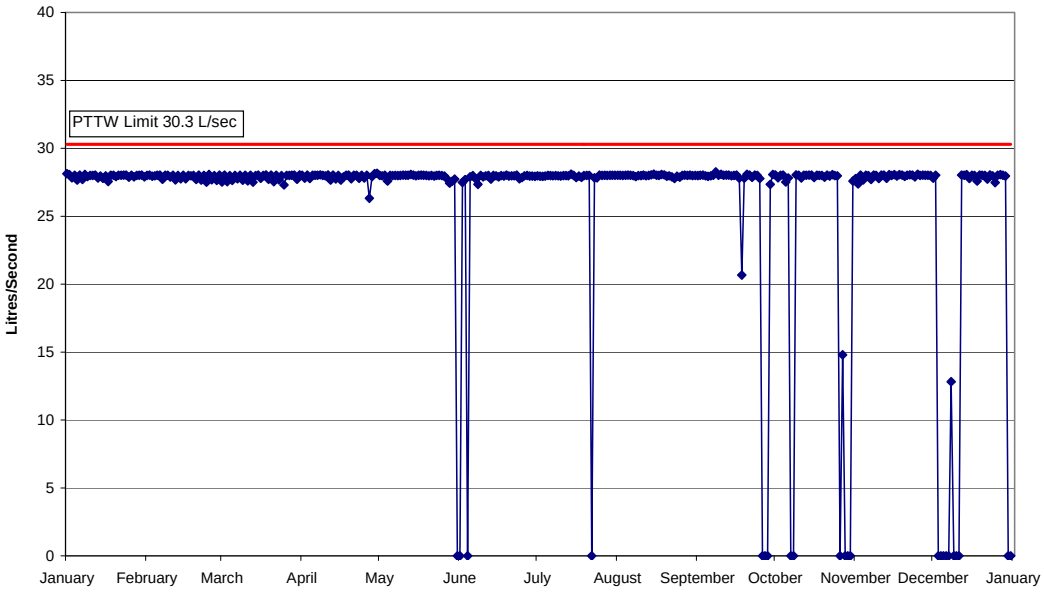



**Figure 27: King City Well No. 4**
**Daily Instantaneous Peak Flow 2008**



## 2.7 Kleinburg

York Region operates a water supply system to service Kleinburg, City of Vaughan, under authority of a C of A issued by the MOE. The C of A includes reference to the valid PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Kleinburg Water Supply are presented in Table 19.

### TABLE 19: Kleinburg Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 2579-77WJ8G<br>November 27, 2007 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 2411-789N8E<br>January 22, 2008<br>January 31, 2014 |
| **MOE Waterworks Number:** | 220002360 |
| **System Classification:** | Water Distribution & Supply II (WDS II) |

### 2.7.1 Water Taking

The PTTW for the Kleinburg Water Supply System allows York Region to withdraw up to 950,400 litres per day from production well 2 over a 24 hour period and 5,237,000 litres per day from production wells 3 and 4 inclusive.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.7.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This 'manual' data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.7.3 Water Withdrawal

The total volume of water taken from the production wells of the Kleinburg Water Supply system for January 1 – December 31, 2008 was 592,835,586 litres or 1,619,769 litres per day.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 20.

**TABLE 20: Permitted and Actual Maximum Daily Withdrawal from the Kleinburg Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Daily Withdrawal During Peak Demand |
|---|---|---|---|
| Well 2 | 950,400 | 626,133 – February 6, 2008 | 65.9% |
| Well 3/4 | 5,237,000 | 3,942,500 – July 16, 2008 | 75.3% |

- *Kleinburg well 4 is pumped into well 3 common header, flow is recorded through well 4 metering*

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 21.

## TABLE 21: Permitted and Actual Maximum Withdrawal from the Kleinburg Production Wells for January 1 – December 31, 2008

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 2,258,401,400 | 592,835,586 | 26.2% |

The monthly average flow rates, maximum daily flow, and permitted daily withdrawal are presented in Figures 28 and 29.

**Figure 28: Kleinburg Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2007**

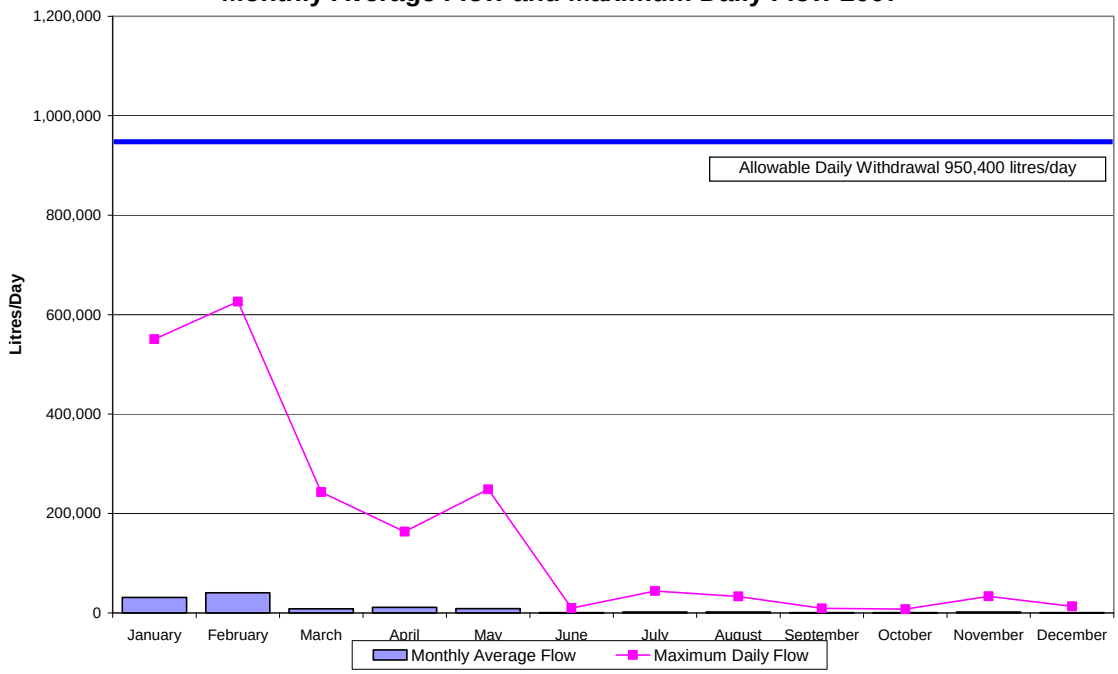
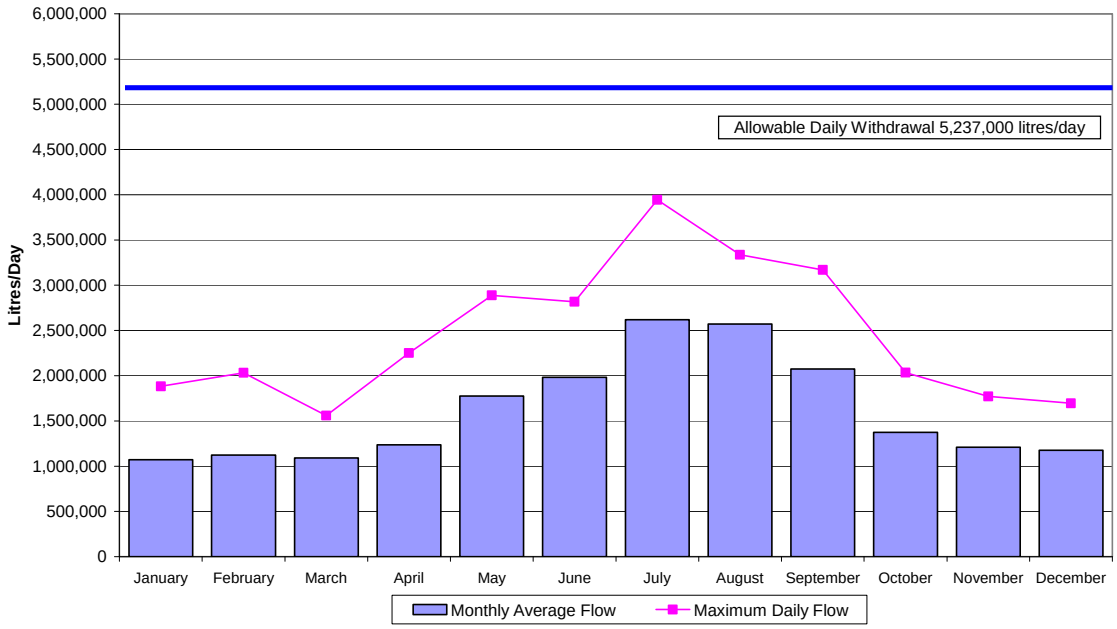


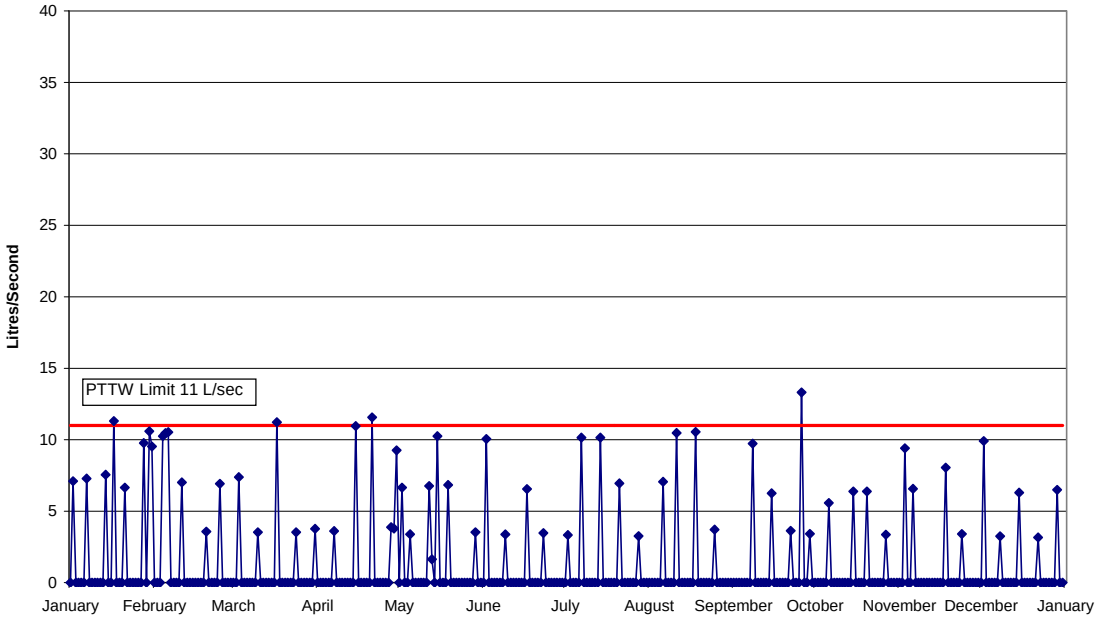

Figure 28: shows a reduced monthly average flow or no monthly average flow recorded throughout the year. This reduction in flow is representative of the permit condition which only allows production well 2 to withdrawal water less than 1,000 litres per day for sampling and maintenance.

**Figure 29: Kleinburg Well No. 3 & 4**
**Monthly Average Flow and Maximum Daily Flow 2008**



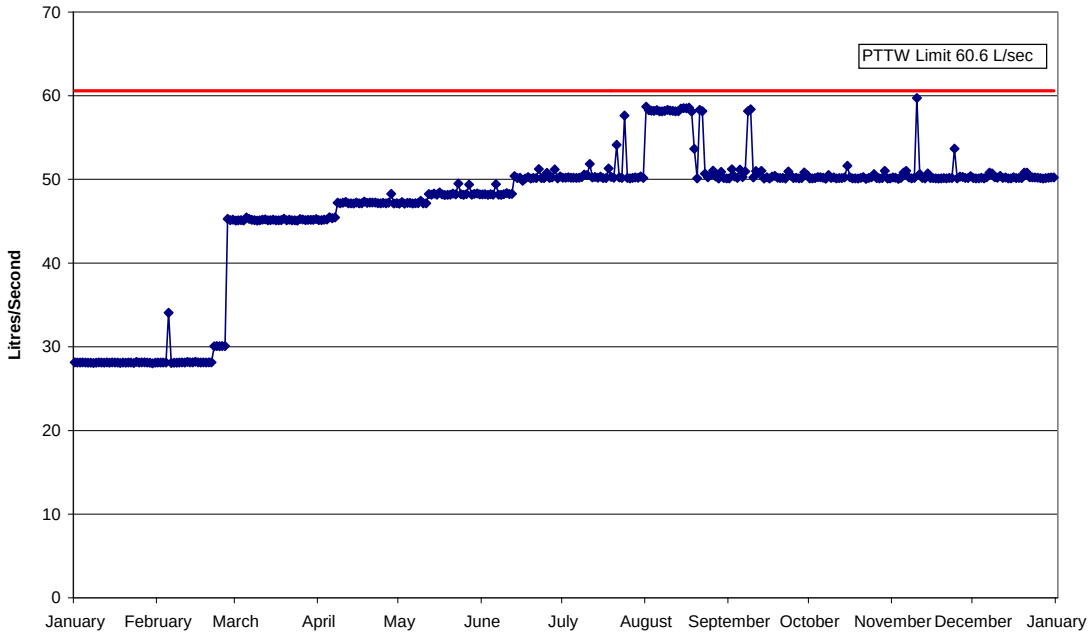

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 30 and 31.

**Figure 30: Kleinburg Well No. 2**
**Daily Instantaneous Peak Flow 2008**



Figures 30 show instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure.

**Figure 31: Kleinburg Well No. 3 & 4**
**Daily Instantaneous Peak Flow 2008**




Figures 31 show an increase in instantaneous peak flow rates beginning March 2008. This increase in flow is representative of the additional flow supplied from Kleinburg Well 4 and a decrease in flow supplied by Kleinburg Well 2.

## 2.8 Mount Albert

York Region operates a water supply system to service Mount Albert, Town of East Gwillimbury, under authority of a C of A issued by the MOE. The C of A includes reference to the valid PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Mount Albert Water Supply are presented in Table 22. All system upgrades required by the C of A have been completed.

### TABLE 22: Mount Albert Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 2899-6H4RRF<br>October 24, 2005 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 0050-7FCMMY<br>June 9, 2008<br>March 31, 2018 |
| **MOE Waterworks Number:** | 220006543 |
| **System Classification:** | Water Distribution & Supply II (WDS II) |

### 2.8.1 Water Taking

The PTTW for the Mount Albert Water Supply System allows York Region to withdraw up to withdraw up to 3,273,120 litres per day from production wells 1 or 2 with a maximum combined total permitted withdrawal of 4,990,000 litres per day. Well 3 is currently not in service, pending the design and construction of the treatment infrastructure for the new well. Upgrades to the Mount Albert water supply system including the development of a new well is required in order to provide additional water supply and adequate standby capacity to service growth anticipated in the community. Once in service, well 3 will be included and limited to the maximum combined total permitted withdrawal of 4,990,000 litres per day for all three wells.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.8.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using

records of total flow and number of operating pump hours. This 'manual' data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.

2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.8.3 Water Withdrawal

The total volume of water taken from the production wells of the Mount Albert Water Supply system for the reporting period of January 1 – December 31, 2008 was 329,364,626 litres or 899,903 litres per day.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 23.

**TABLE 23: Permitted and Actual Maximum Daily Withdrawal from the Mount Albert Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Daily Withdrawal During Peak Demand |
|---|---|---|---|
| Well 1 | 3,273,120 | 2,195,313 – June 15, 2008 | 67.1% |
| Well 2 | 3,273,120 | 2,554,188 – July 19, 2008 | 78.0% |
| Well 1 & 2* | 4,990,000 | 2,554,188 – July 19, 2008 | 51.2% |
| Well 3* | 3,273,120 | not yet commissioned | - |

- **Well 3 to be included and limited to the maximum daily combined total permitted withdrawal of 4,990,000 litres per day for all three wells.*

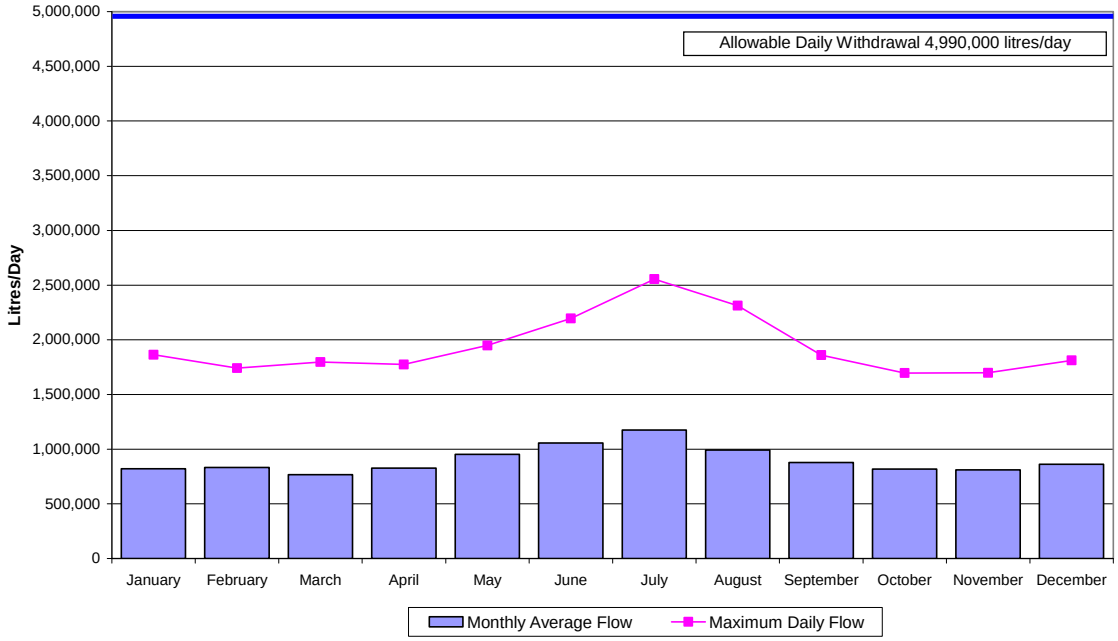
The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 24.

**TABLE 24: Permitted and Actual Maximum Withdrawal from the Mount Albert Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 1,826,340,000 | 329,364,626 | 18.0% |

The monthly average flow rates, maximum daily flow, and permitted daily withdrawal are presented in Figure 32.

**Figure 32: Mount Albert Well No. 1 & 2**
**Monthly Average Flow and Maximum Daily Flow 2008**




The actual volumes of water taken from the Mount Albert production wells during January 1 – December 31, 2008 did not exceed the permitted daily withdrawal volumes.

The '*Daily Instantaneous Peak Flow (litres)*' for January 1- December 31, 2008 are presented in Figures 33 and 34.

**Figure 33: Mount Albert Well No. 1**
**Daily Instantaneous Peak Flow 2008**

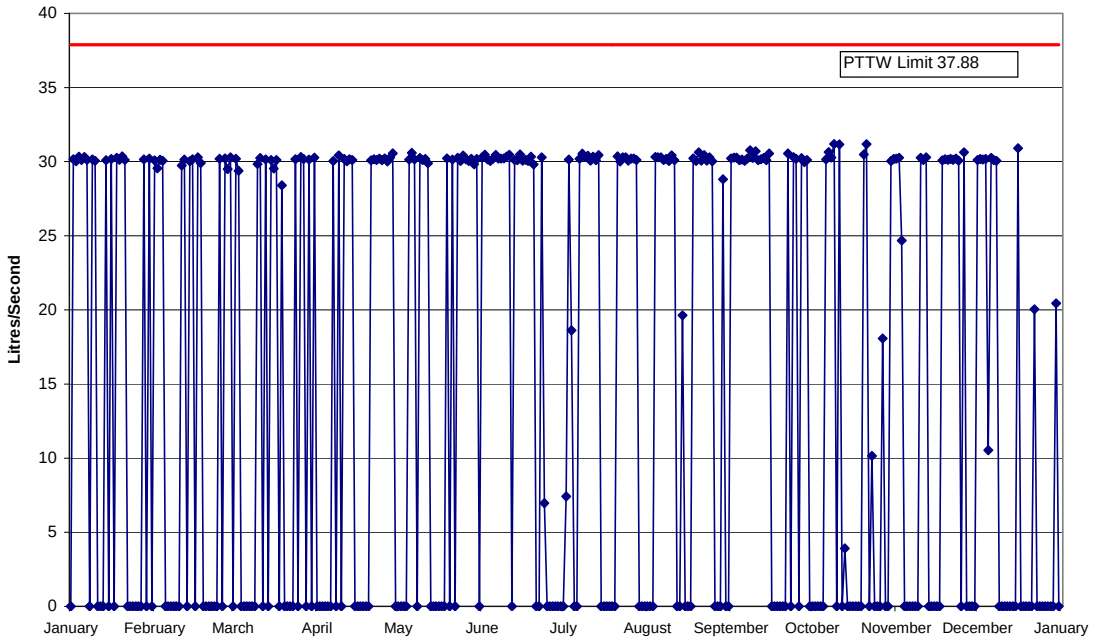
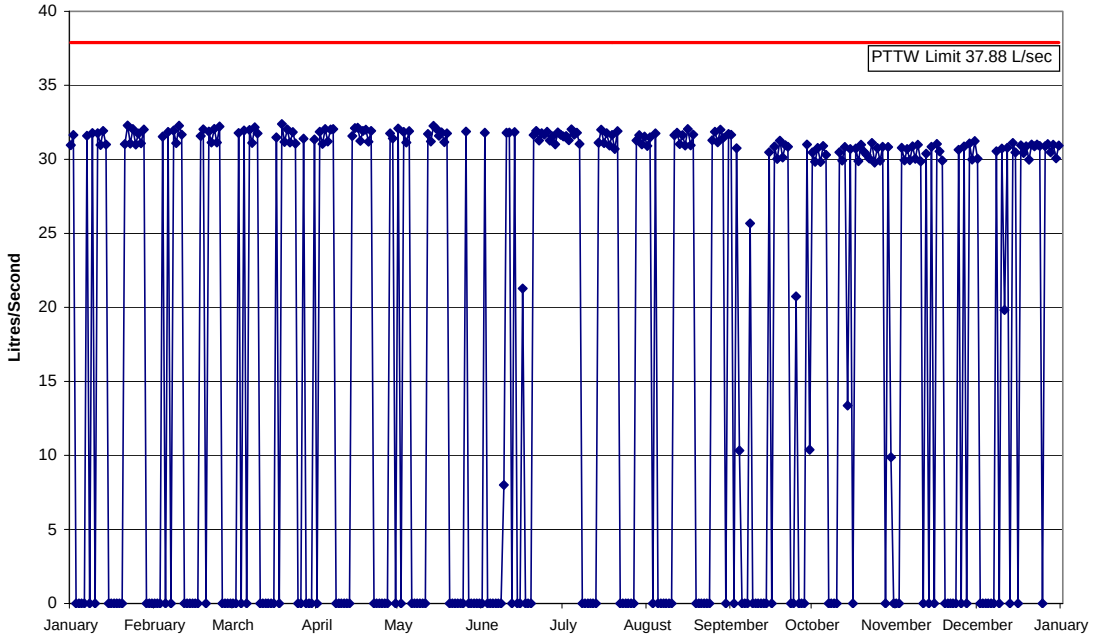



**Figure 34: Mount Albert Well No. 2**
**Daily Instantaneous Peak Flow 2008**



## 2.9 Newmarket/East Gwillimbury

York Region operates a water supply system to service the communities of Holland Landing, Sharon and Queensville in the Town of East Gwillimbury and the Town of Newmarket under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Newmarket/East Gwillimbury Water Supply are presented in Table 25. All system upgrades required by the C of A have been completed.

### TABLE 25: Newmarket/East Gwillimbury Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 3509-6ALJGJ<br>July 7, 2005 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 6623-68QQ6L<br>March 10, 2005<br>March 31, 2015 |
| **MOE Waterworks Number:**<br>Holland Landing:<br>Newmarket:<br>Queensville: | <br>220004046<br>220002413<br>260001955 |
| **System Classification:** | Water Distribution & Supply III (WDS III) |

### 2.9.1 Water Taking

The PTTW for the Newmarket/East Gwillimbury Water Supply System allows York Region to withdraw up to 56,036,736 litres per day from all production wells.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.9.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data

was used to generate the maximum daily withdrawal and monthly average flow tables and figures.

2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.9.3 Water Withdrawal

The total volume of water taken from the production wells of the Newmarket/East Gwillimbury Water Supply system for January 1 – December 31, 2008 was 8,638,288,317 litres or 23,601,880 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 26.

**TABLE 26: Permitted and Actual Maximum Daily Withdrawal from the Newmarket/East Gwillimbury Production Wells for the January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of permitted daily withdrawal during peak demand |
|---|---|---|---|
| Holland Landing Well 1 | 2,291,184 | 1,989,375 – October 31, 2008 | 86.8% |
| Holland Landing Well 2 | 3,600,432 | 2,126,438 – September 16, 2008 | 59.1% |
| Newmarket Well 1 | 2,291,184 | 2,023,250 – November 22, 2008 | 88.3% |
| Newmarket Well 2 | 4,582,512 | 4,434,000 – November 22, 2008 | 96.8% |
| Newmarket Well 13 | 5,891,760 | 5,638,750 – December 7, 2008 | 95.7% |
| Newmarket Well 14 | 2,291,184 | 1,159,898 – December 1, 2008 | 50.6% |
| Newmarket Well 15 | 3,273,120 | 2,885,656 – October 17, 2008 | 88.2% |
| Newmarket Well 16 | 5,629,824 | 5,518,250 – September 18, 2008 | 98.0% |
| Queensville Well 1 | 6,546,384 | 5,887,563 – December 10, 2008 | 89.9% |
| Queensville Well 2 | 6,546,384 | 6,028,875 – May 23, 2008 | 92.1% |
| Queensville Well 3 | 6,546,384 | 5,916,625 – November 20, 2008 | 90.3% |
| Queensville Well 4 | 6,546,384 | 6,154,000 – December 23, 2008 | 94.0% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 27.

**TABLE 27: Permitted and Actual Maximum Withdrawal from the Newmarket//East Gwillimbury/Holland Landing Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 20,453,408,640 | 8,638,288,317 | 42.2% |

The monthly average flow rates, maximum daily flow, and permitted daily withdrawal are presented in Figures 35 through 46.

**Figure 35: Holland Landing Well No. 1**
**Monthly Average Flow and Maximum Daily Flow 2008**

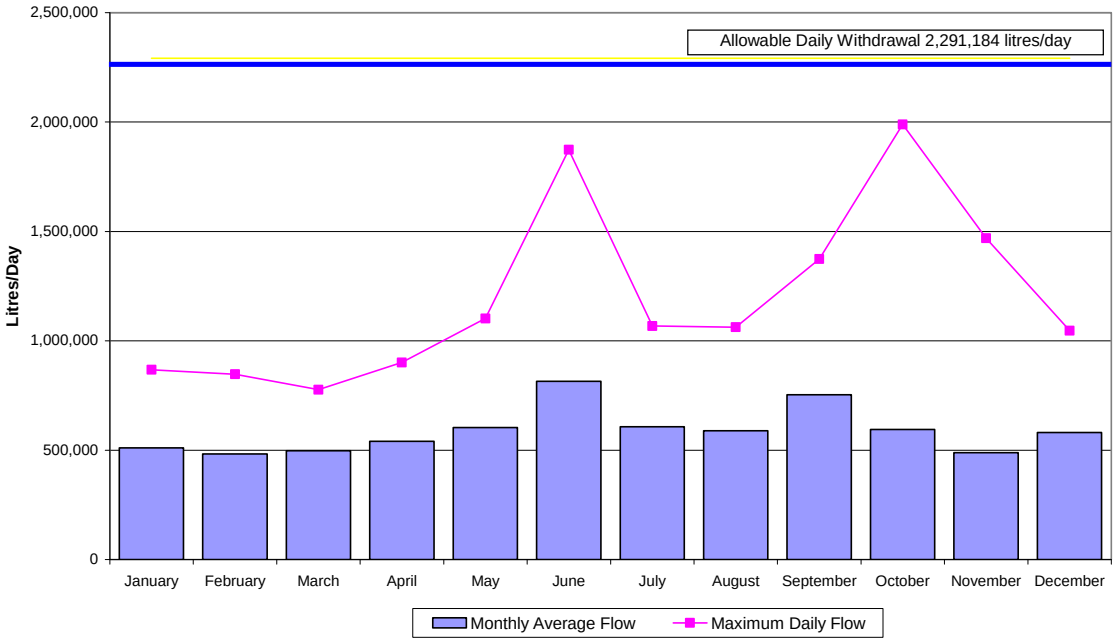


**Figure 36: Holland Landing Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

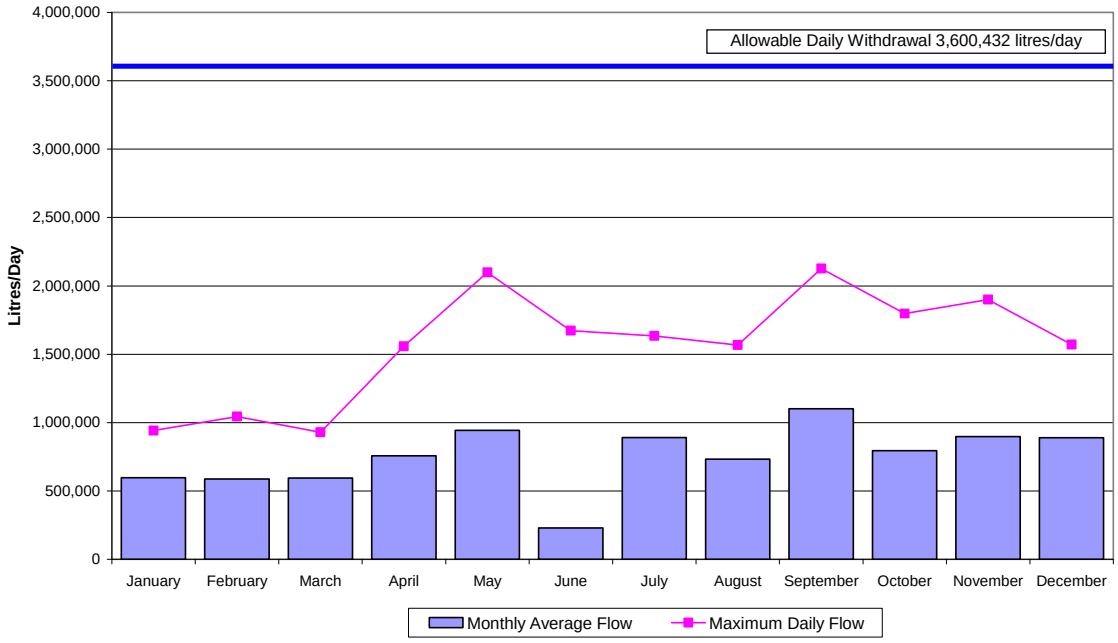



Figure 36 shows a reduced monthly average flow recorded for the month of June 2008. This reduction in flow due to the scheduled and unscheduled maintenance conducted on the well annually to improve the overall operation of the water system.

**Figure 37: Newmarket Well No. 1**
**Monthly Average Flow and Maximum Daily Average 2008**

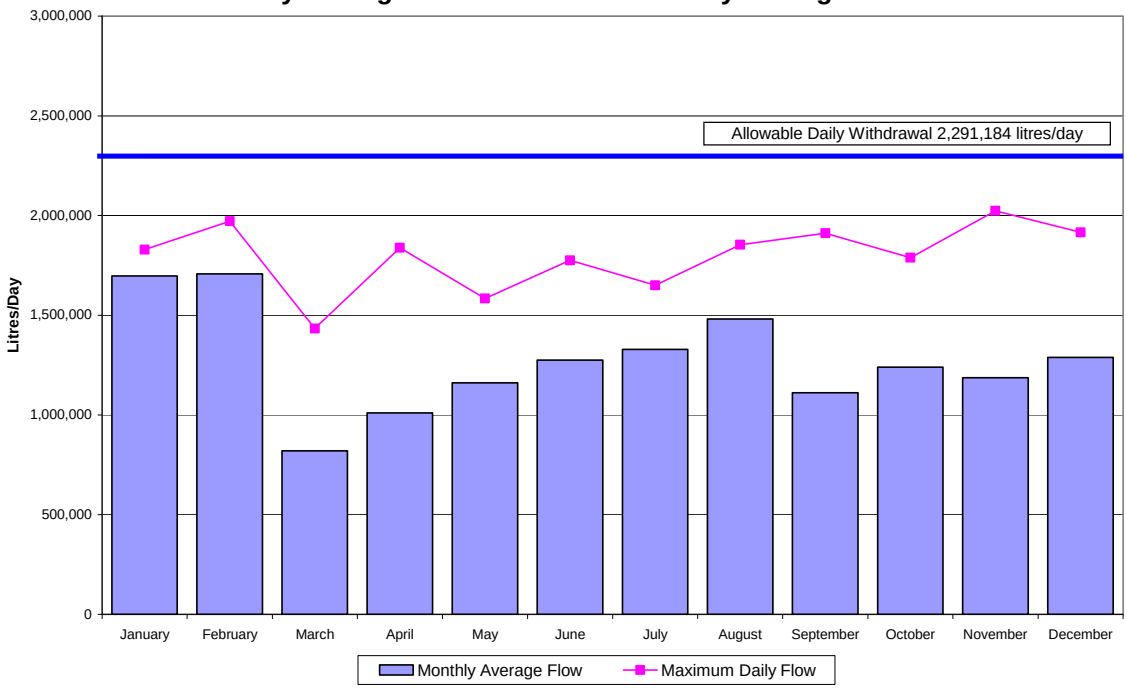



**Figure 38: Newmarket Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

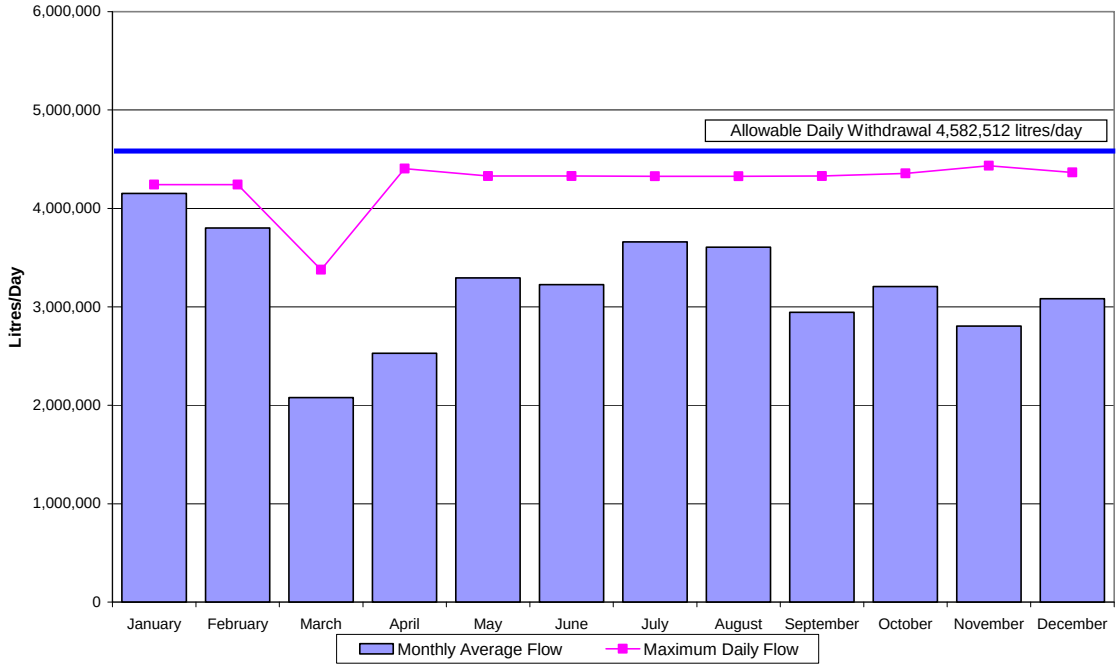


**Figure 39: Newmarket Well No. 13**
**Monthly Average Flow and Maximum Daily Flow 2008**

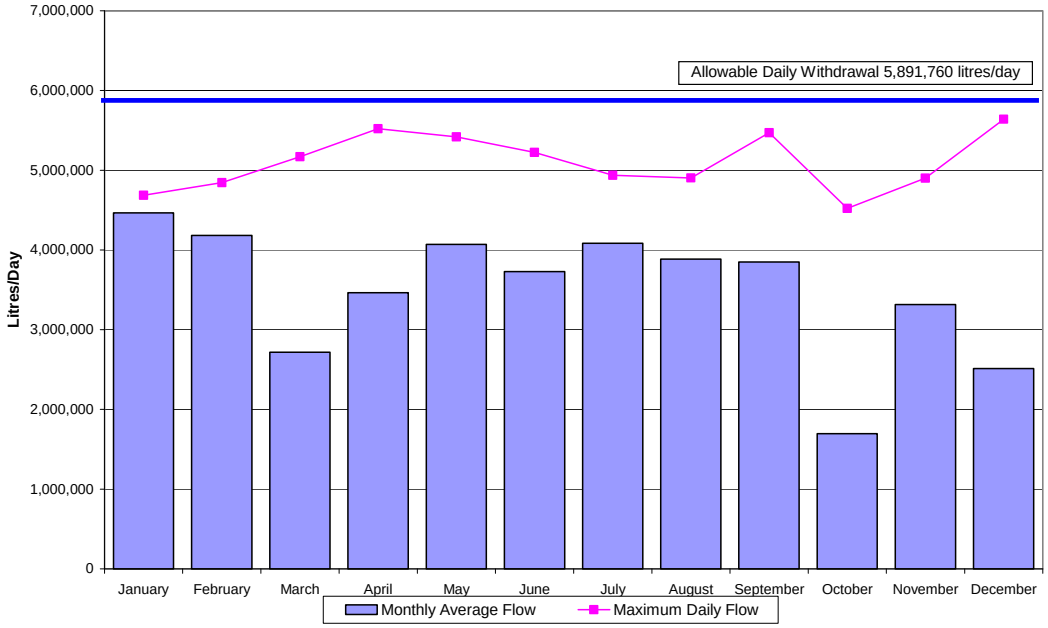



**Figure 40: Newmarket Well No. 14**
**Monthly Average Flow and Maximum Daily Flow 2008**

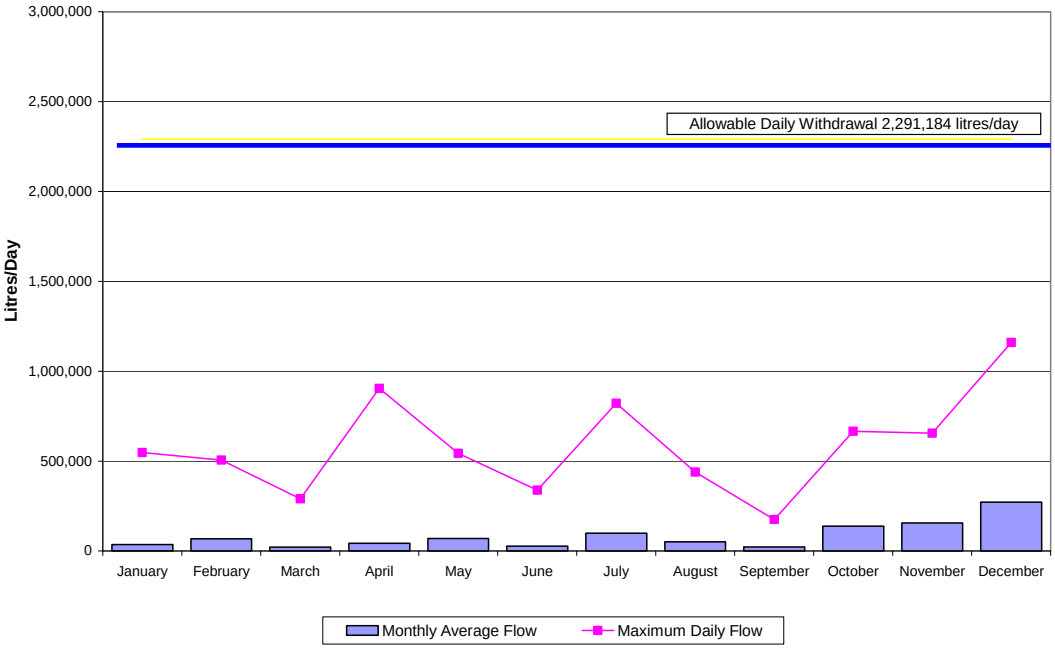



Figure 40 shows a reduced monthly average flow recorded for the month of January to November 2008. This reduction in flow due to the scheduled and unscheduled maintenance conducted on the well annually to improve the overall operation of the water system. In addition, Newmarket Well No. 14 is considered a back-up well servicing the east zone of Newmarket and is only operated during peak demands.

**Figure 41: Newmarket Well No. 15**
**Monthly Average Flow and Maximum Daily Flow 2008**

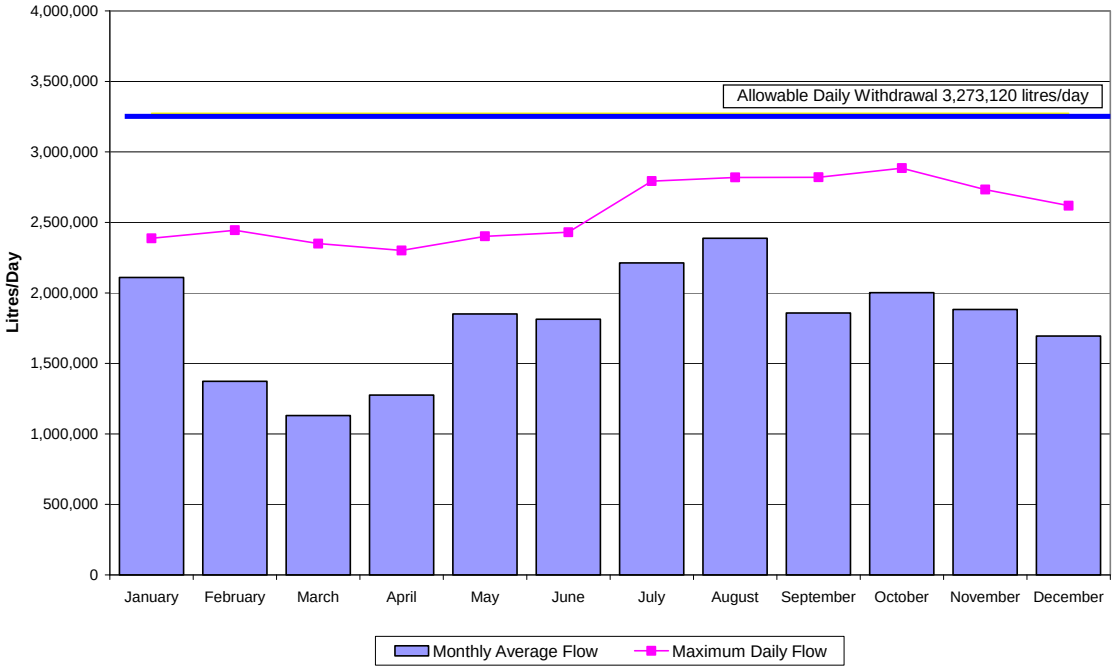



**Figure 42: Newmarket Well No. 16**
**Monthly Average Flow and Maximum Daily Flow 2008**

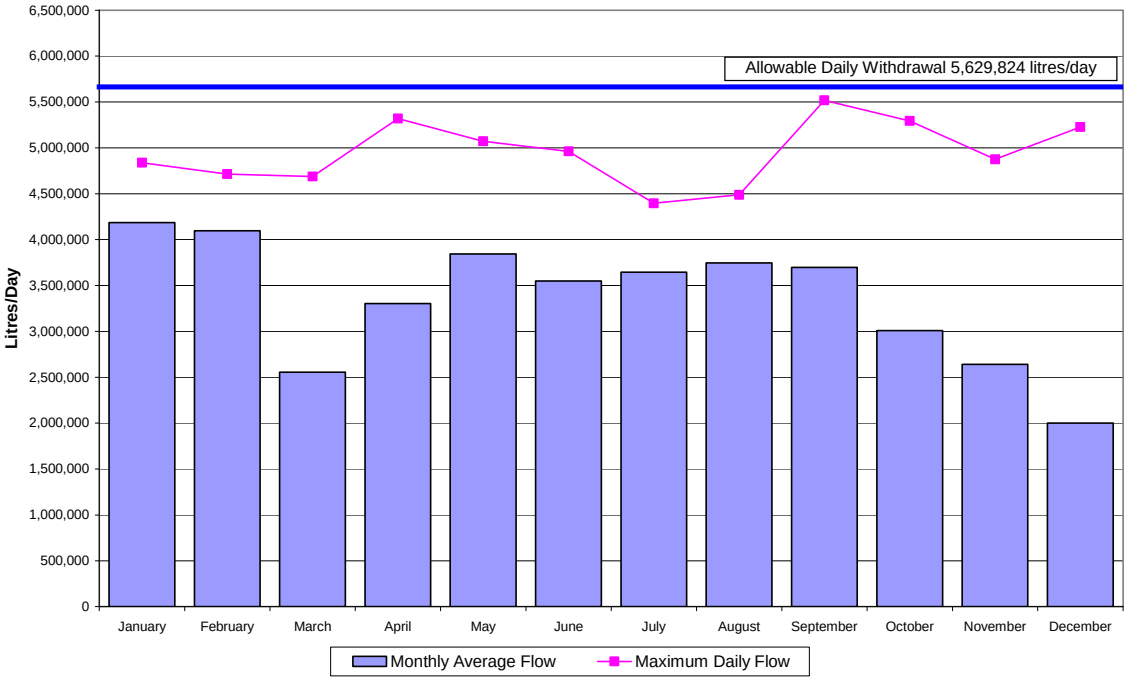


**Figure 43: Queensville Well No. 1**
**Monthly Average Flow and Maximum Daily Flow 2008**

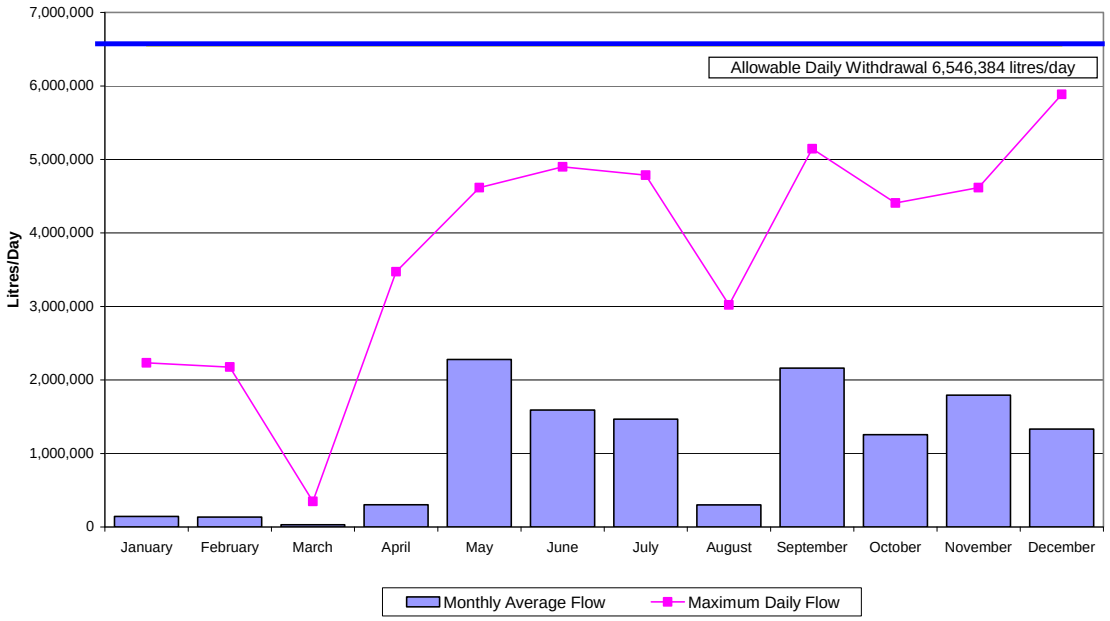



Figure 43 shows a reduced monthly average flow recorded for the months of January to April and August 2008. This reduction in flow due to the scheduled and unscheduled maintenance conducted on the well annually to improve the overall operation of the water system.

**Figure 44: Queensville Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

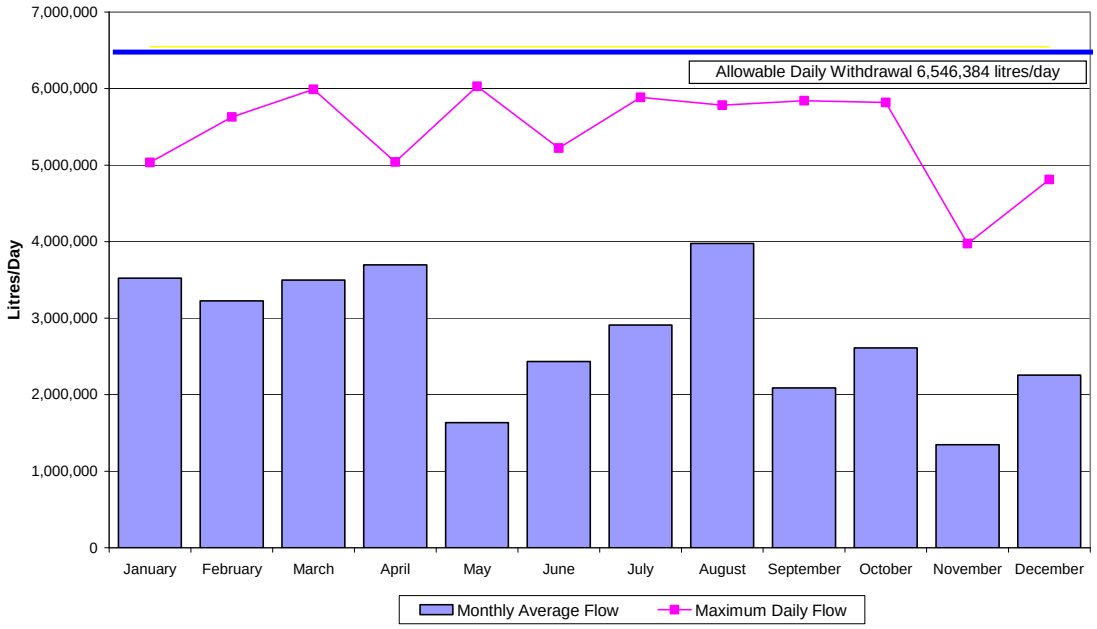


**Figure 45: Queensville Well No. 3**
**Monthly Average Flow and Maximum Daily Flow 2008**

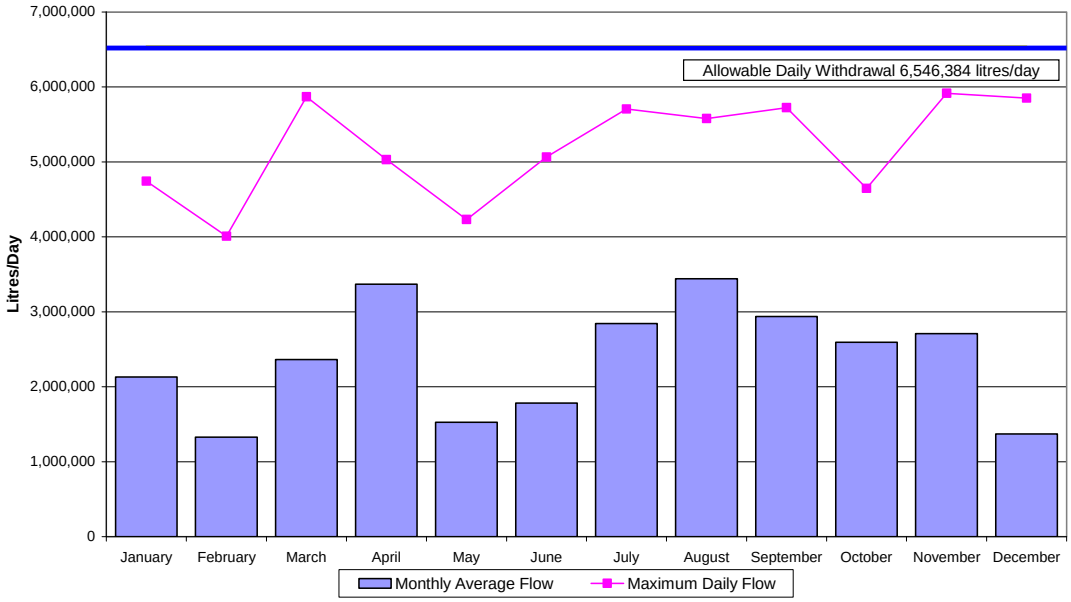
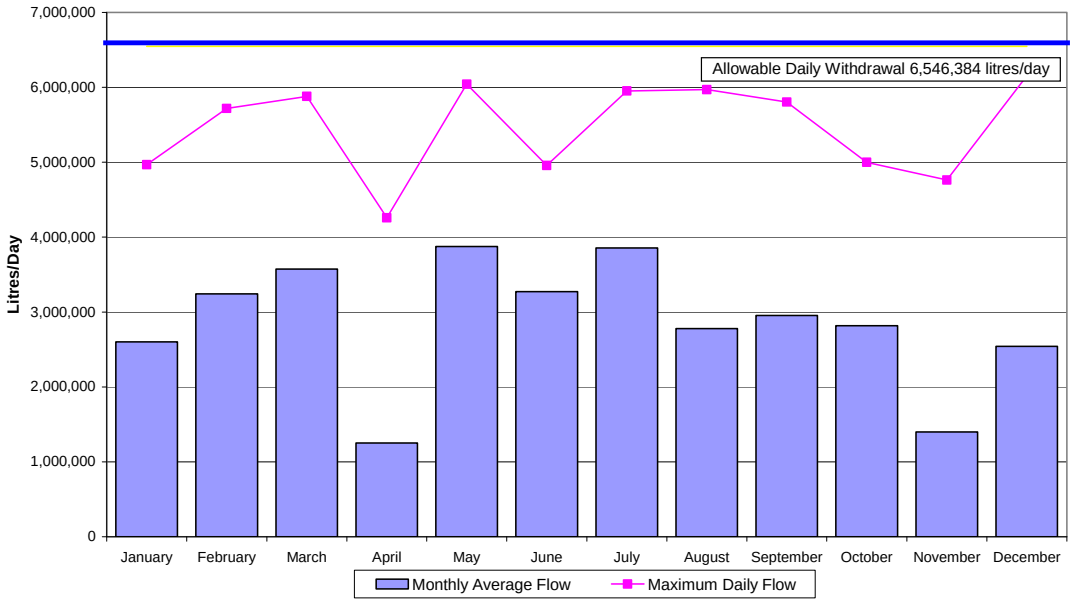



**Figure 46: Queensville Well No. 4**
**Monthly Average Flow and Maximum Daily Flow 2008**




Throughout the period of January 1 – December 31, 2008 the withdrawal rates from the Newmarket/East Gwillimbury production wells did not exceed the permitted limits.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 47 through 58.

**Figure 47: Holland Landing Well No. 1**
**Daily Instantaneous Peak Flow 2008**

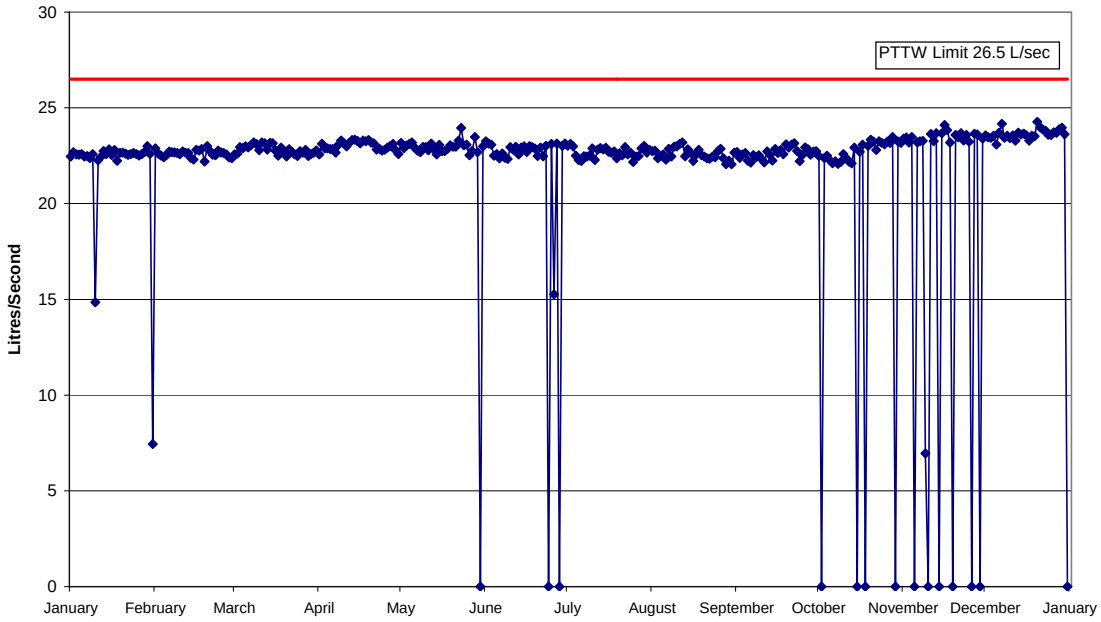



**Figure 48: Holland Landing Well No. 2**
**Daily Instantaneous Peak Flow 2008**

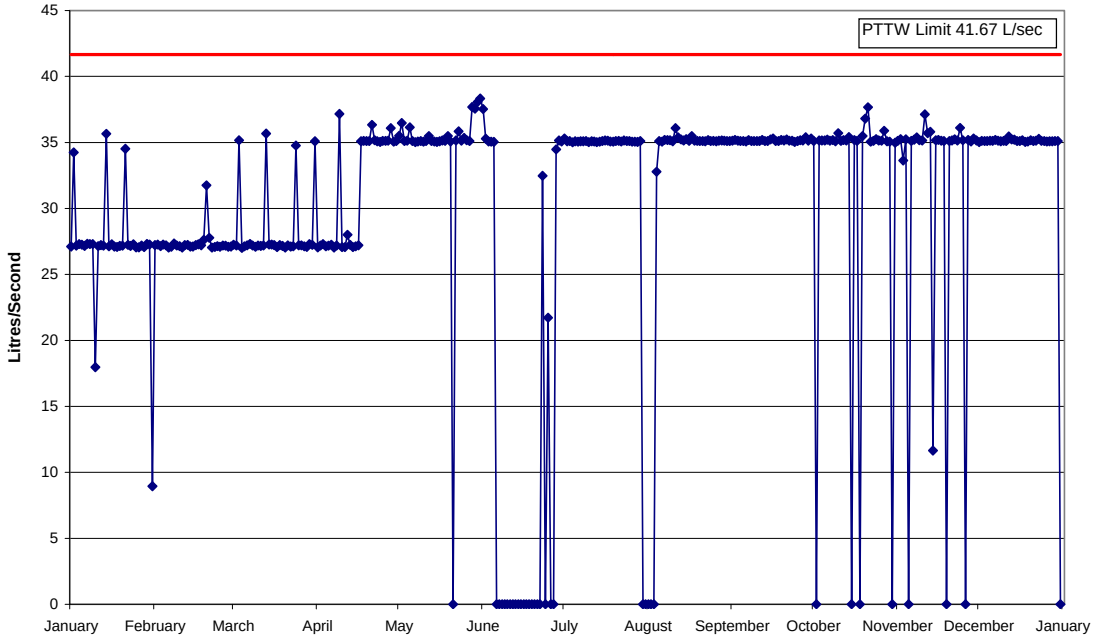


**Figure 49: Newmarket Well No. 1**
**Daily Instantaneous Peak Flow 2008**

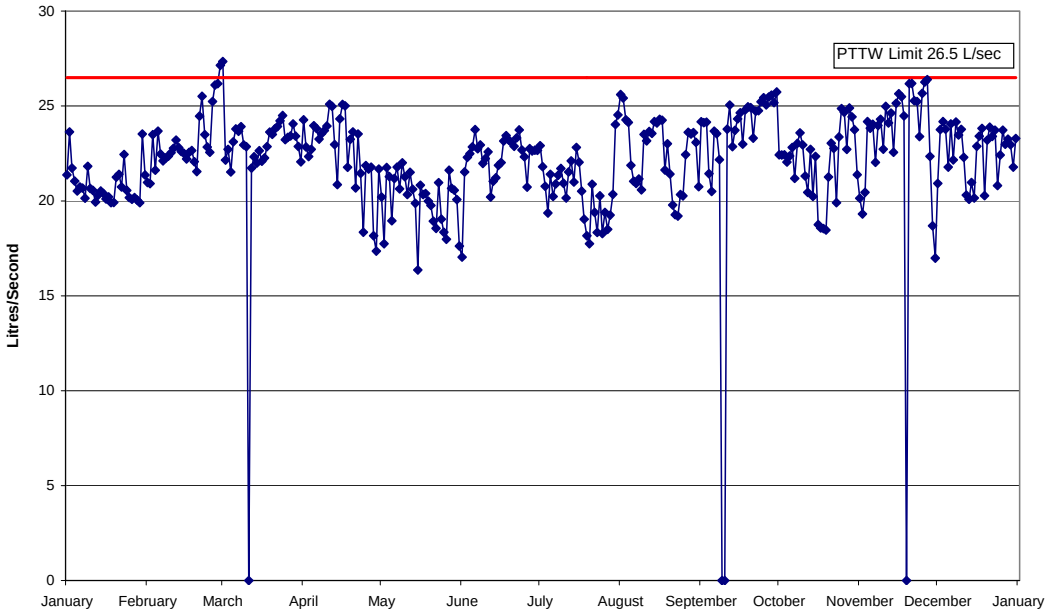



**Figure 50: Newmarket Well No. 2**
**Daily Instantaneous Peak Flow 2008**

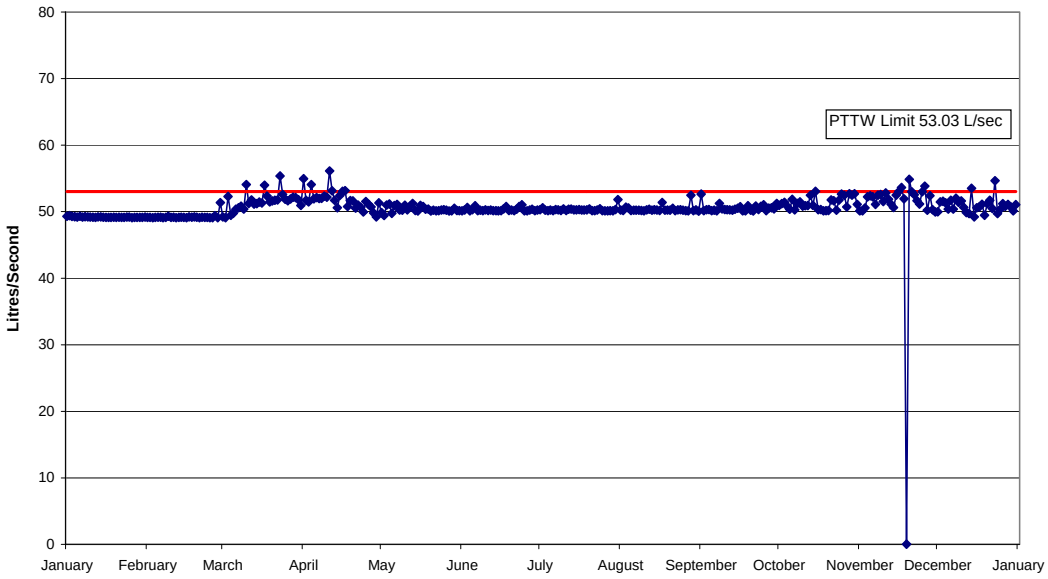



Figure 49 and 50 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure.

**Figure 51: Newmarket Well No. 13**
**Daily Instantaneous Peak Flow 2008**

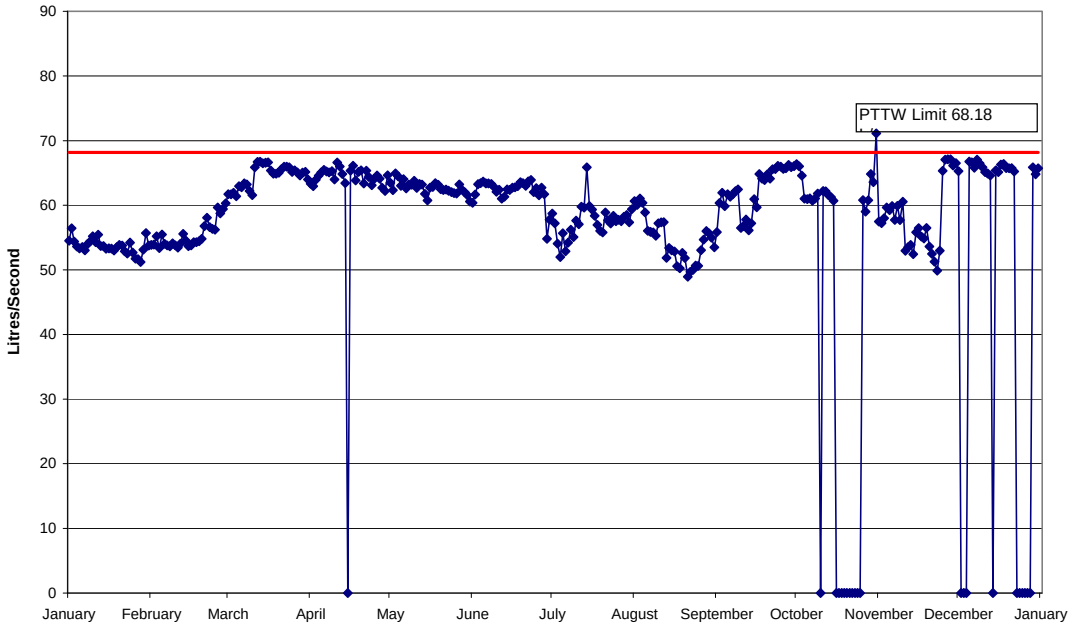



**Figure 52: Newmarket Well No. 14**
**Daily Instantaneous Peak Flow 2008**

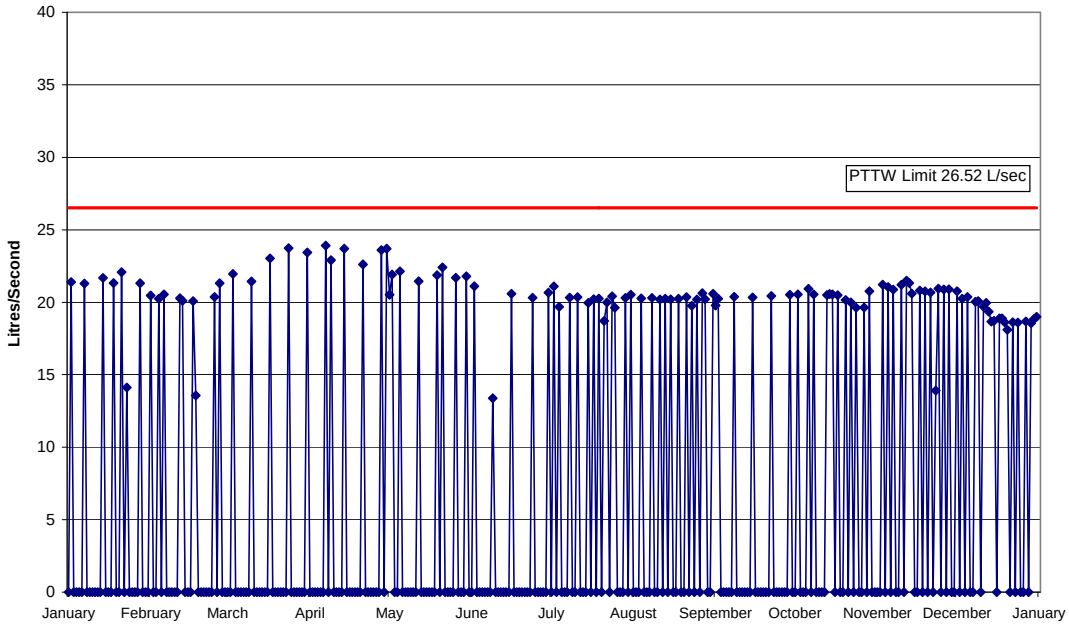



Figure 51 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure.

**Figure 53: Newmarket Well No. 15**
**Daily Instantaneous Peak Flow 2008**

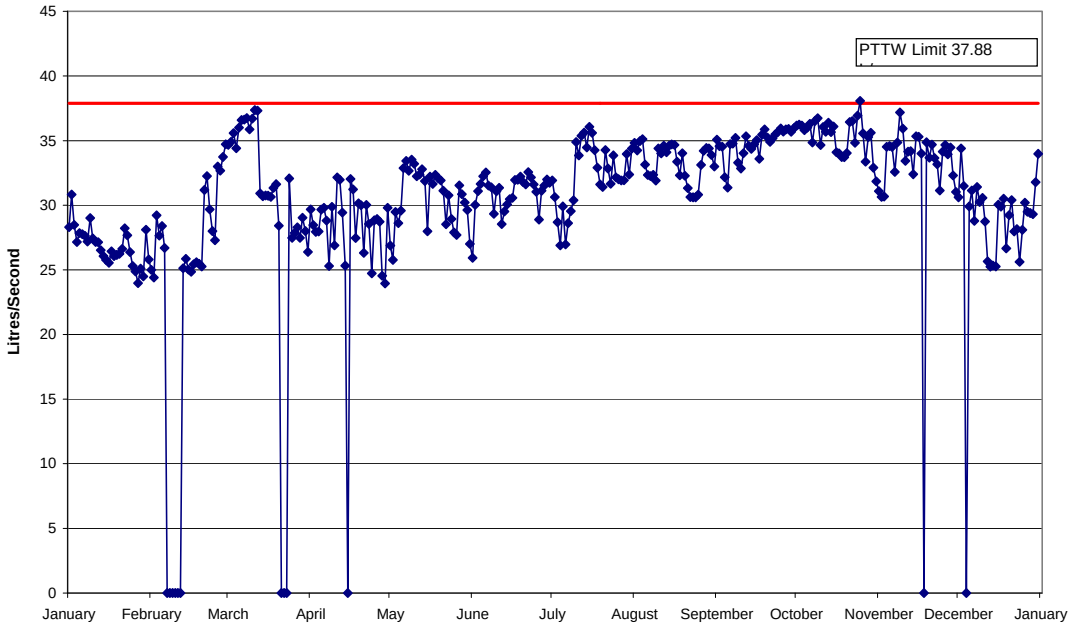
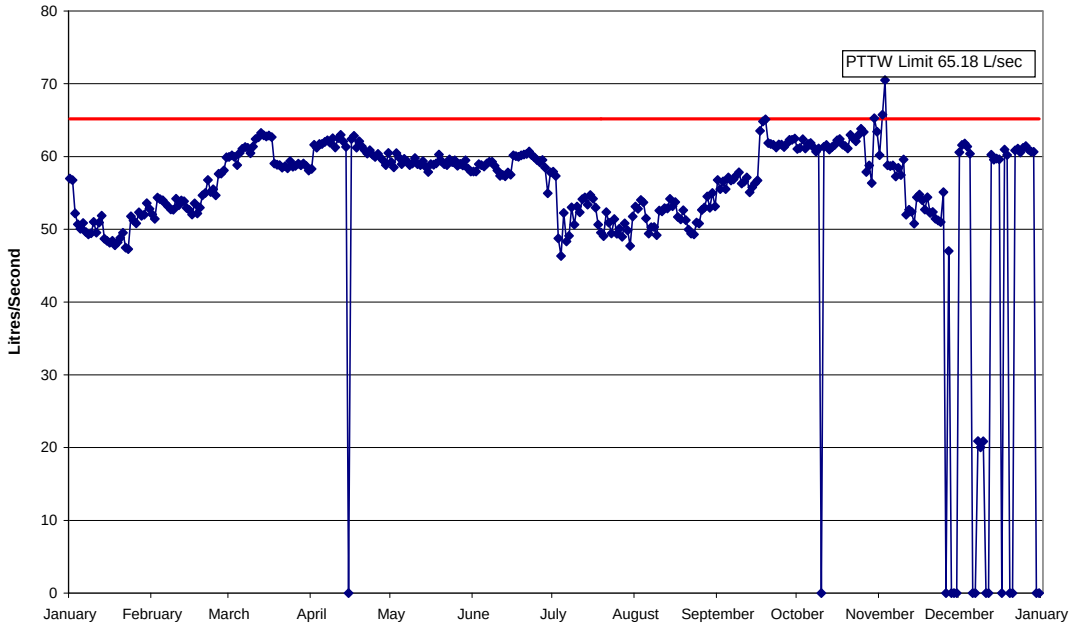



**Figure 54: Newmarket Well No. 16**
**Daily Instantaneous Peak Flow 2008**




Figures 53 and 54 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure.

**Figure 55: Queensville Well No. 1**
**Daily Instantaneous Peak Flow 2008**

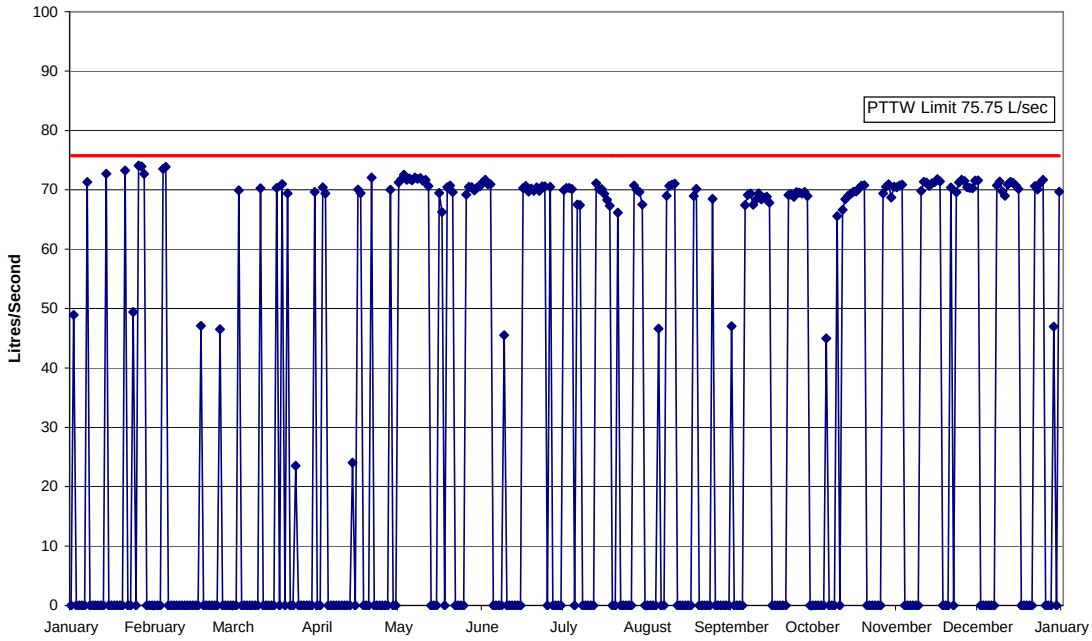



**Figure 56: Queensville Well No. 2**
**Daily Instantaneous Peak Flow 2008**

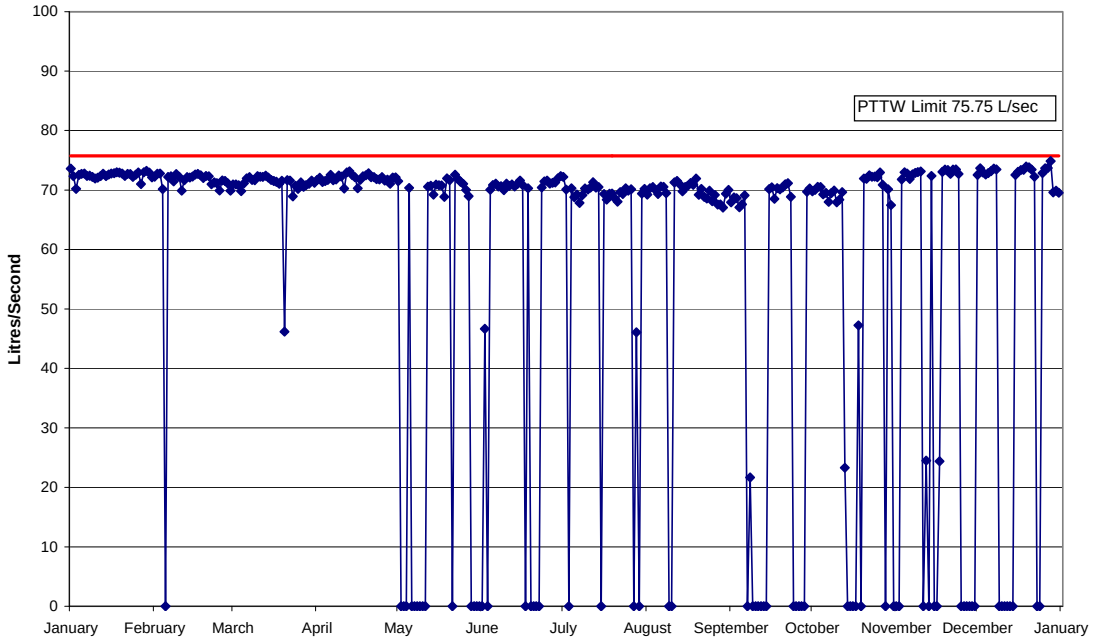


**Figure 57: Queensville Well No. 3**
**Daily Instantaneous Peak Flow 2008**

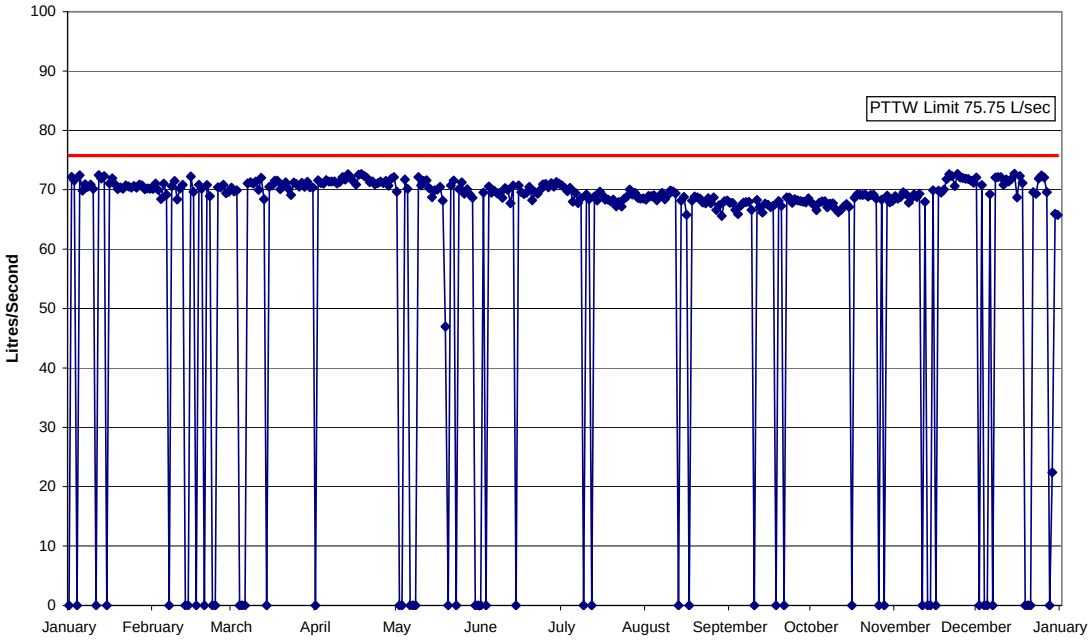
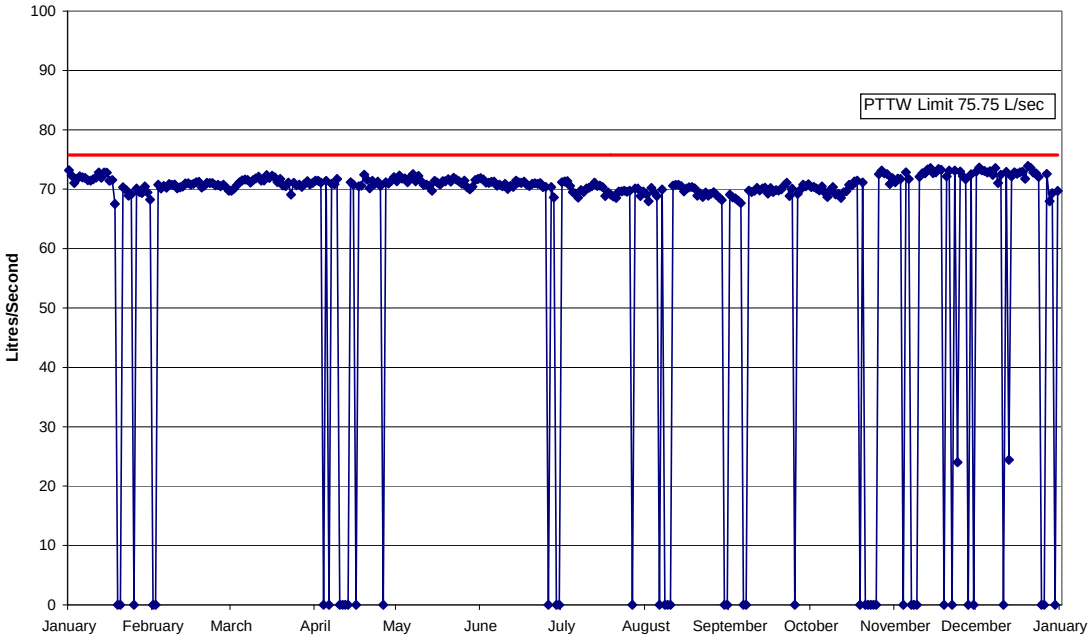



**Figure 58: Queensville Well No. 4**
**Daily Instantaneous Peak Flow 2008**



## 2.10 Nobleton

York Region operates a water supply system to service Nobleton, Township of King, under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Nobleton Water Supply are presented in Table 28. All system upgrades required by the C of A have been completed.

### TABLE 28: Nobleton Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 1146-7JLPMR<br>October 7, 2008 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 7433-6HWTED<br>November 15, 2005<br>December 31, 2010 |
| **MOE Waterworks Number:** | 220002306 |
| **System Classification:** | Water Distribution & Supply (WDS II) |

### 2.10.1 Water Taking

The PTTW for the Nobleton Water Supply System allows York Region to withdraw up to 3,927,740 litres per day from production wells 2 and 3.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

### 2.10.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.10.3 Water Withdrawal

The total volume of water taken from the production wells of the Nobleton Water Supply system in January 1 – December 31, 2008 was 324,855,986 litres or 887,585 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 29.

**TABLE 29: Permitted and Actual Maximum Daily Withdrawal from the Nobleton Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 2 | 1,963,872 | 1,637,000 – May 29, 2008 | 83.3% |
| Well 3 | 1,963,872 | 1,000,438 – July 16, 2008 | 50.9% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 30.

**TABLE 30: Permitted and Actual Maximum Withdrawal from the Nobleton Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 1,433,625,100 | 324,855,986 | 22.6% |

The monthly average flow rates, maximum daily flow, and the permitted daily withdrawal are presented in Figures 59 and 60.

**Figure 59: Nobleton Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

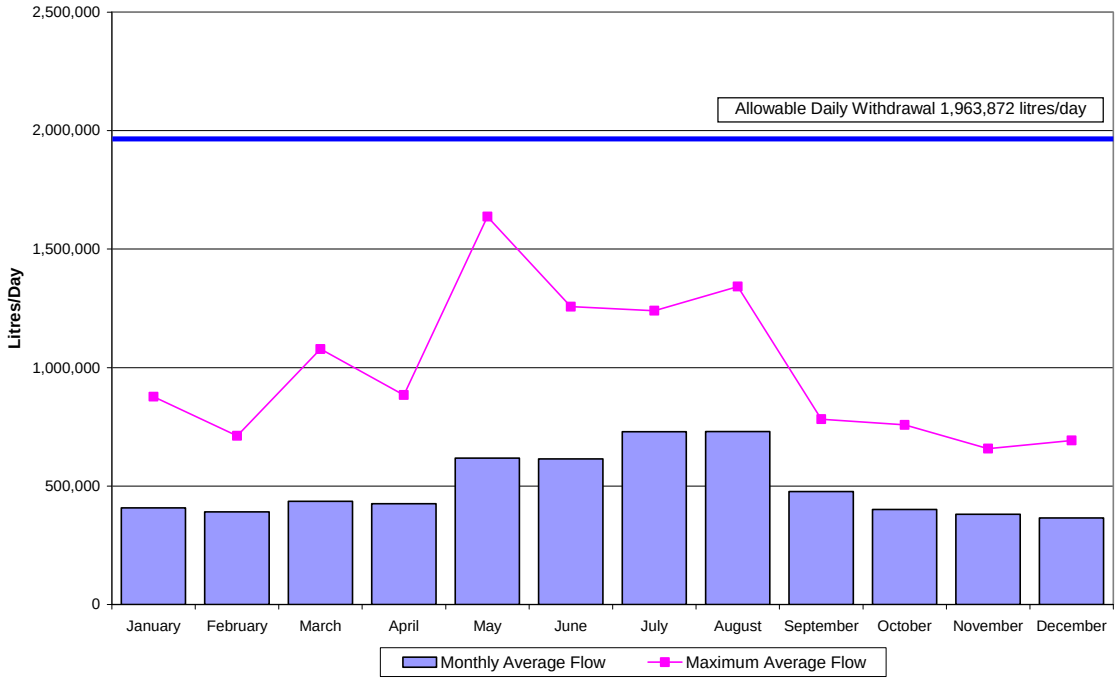
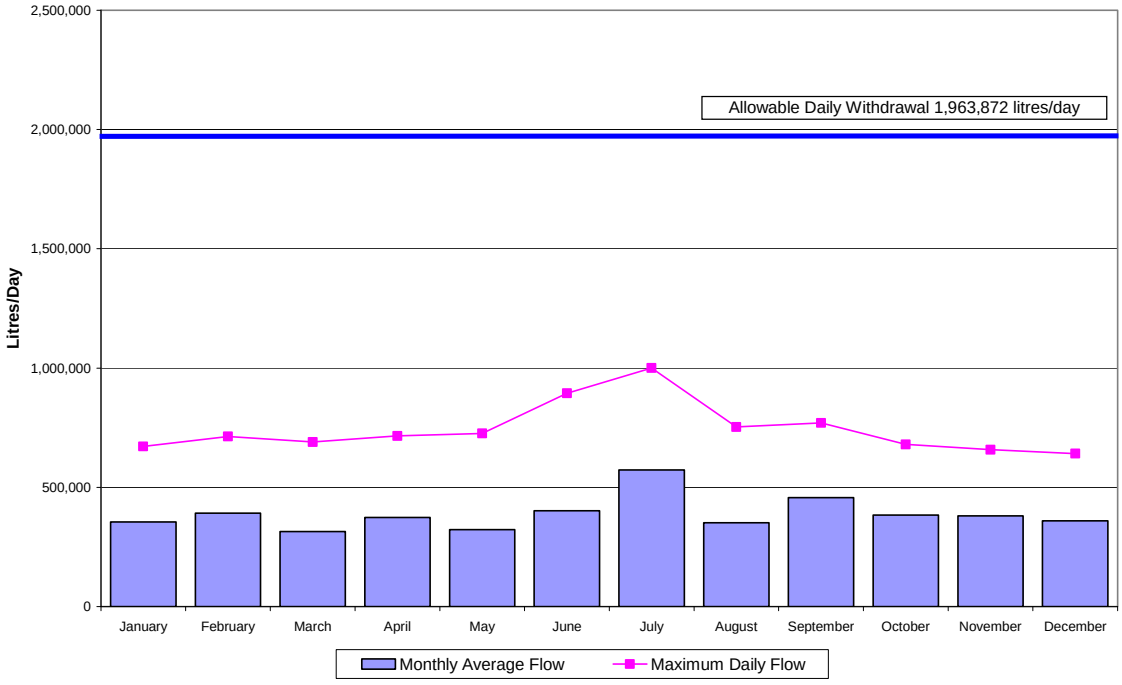



**Figure 60: Nobleton Well No. 3**
**Monthly Average Flow and Maximum Daily Flow 2008**




The withdrawal rates from the Nobleton production wells did not exceed the permitted limits during January 1 – December 31, 2008.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 61 and 62.

**Figure 61: Nobleton Well No. 2**
**Daily Instantaneous Peak Flow 2008**

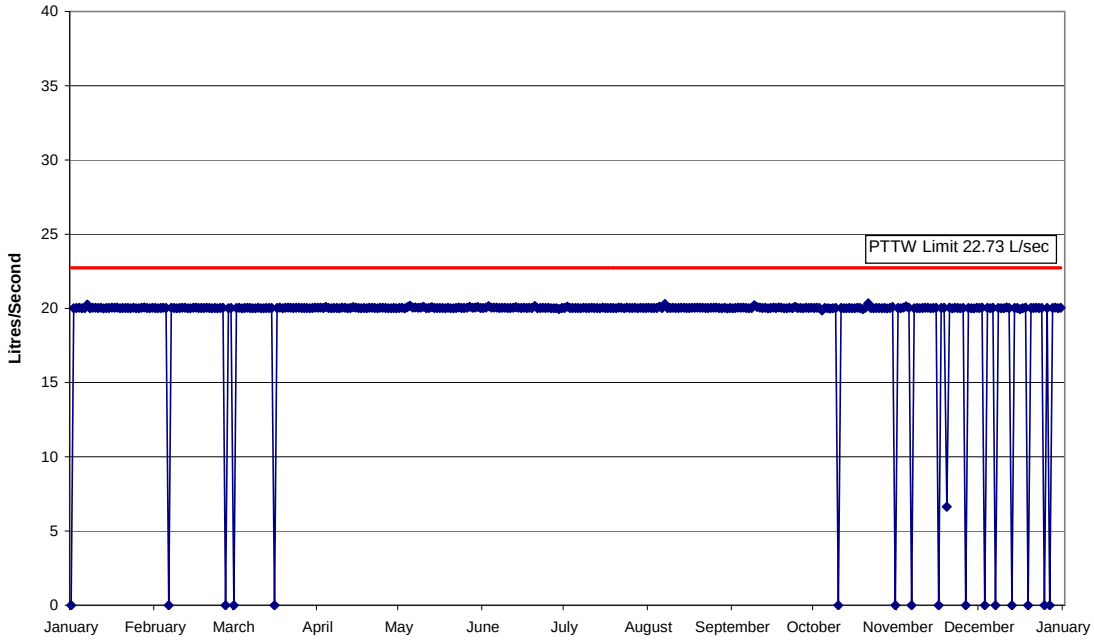
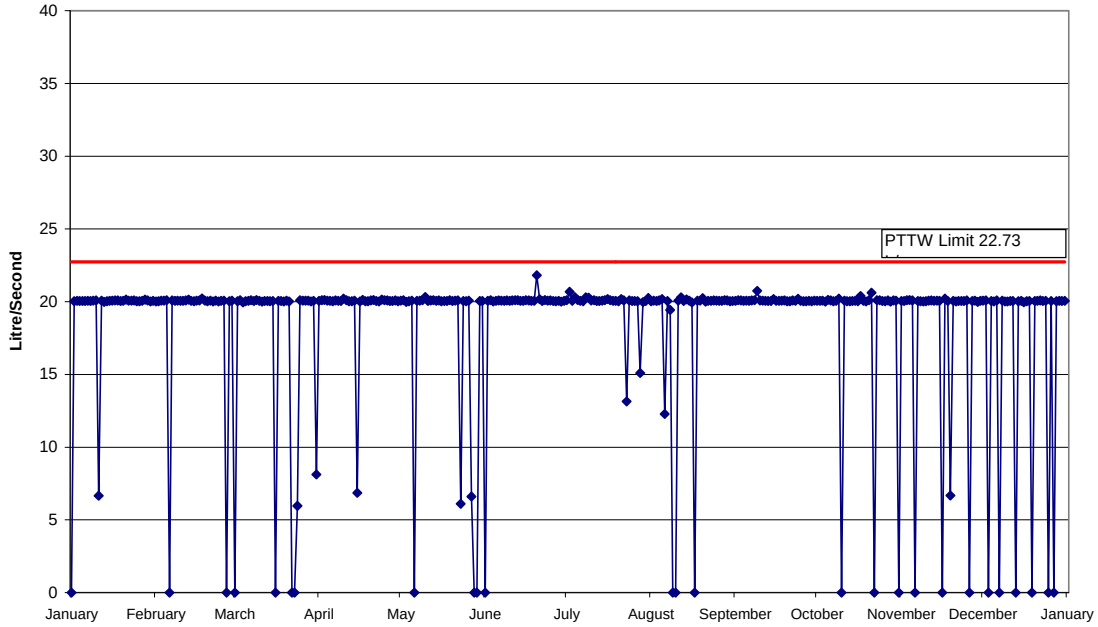



**Figure 62: Nobleton Well No. 3**
**Daily Instantaneous Peak Flow 2008**



## 2.11 Schomberg

York Region operates a water supply system to service Schomberg, Township of King, under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Schomberg Water Supply are presented in Table 31. All system upgrades required by the C of A have been completed.

### TABLE 31: Schomberg Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 2234-7BKKK9<br>March 25, 2008 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 0706-7E8T5G<br>June 3, 2008<br>April 30, 2018 |
| **MOE Waterworks Number:** | 220004901 |
| **System Classification:** | Water Distribution & Supply (WDS II) |

#### 2.11.1 Water Taking

The PTTW for the Schomberg Water Supply System allows York Region to withdraw up to 5,434,240 litres per day from production wells 2, 3 and 4. Well 4 is currently not in service, pending the design and construction of the new treatment plant which will treat and distribute water from all three wells.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

#### 2.11.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored

electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.11.3 Water Withdrawal

The total volume of water taken from the production wells of the Schomberg Water Supply system for January 1 – December 31, 2008 was 238,726,274 or 652,257 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 32.

**TABLE 32: Permitted and Actual Maximum Daily Withdrawal from the Schomberg Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 2 | 1,636,560 | 1,402,234 – September 1, 2008 | 85.7% |
| Well 3 | 2,290,000 | 1,372,969 – April 23, 2008 | 59.9% |
| Well 4 | 1,507,680 | not yet commissioned | |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 33.

**TABLE 33: Permitted and Actual Maximum Withdrawal from the Schomberg Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 1,983,497,600 | 238,726,274 | 12.0% |

The monthly average flow rates, maximum daily flow, and the permitted daily withdrawal are presented in Figures 63 and 64.

**Figure 63: Schomberg Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

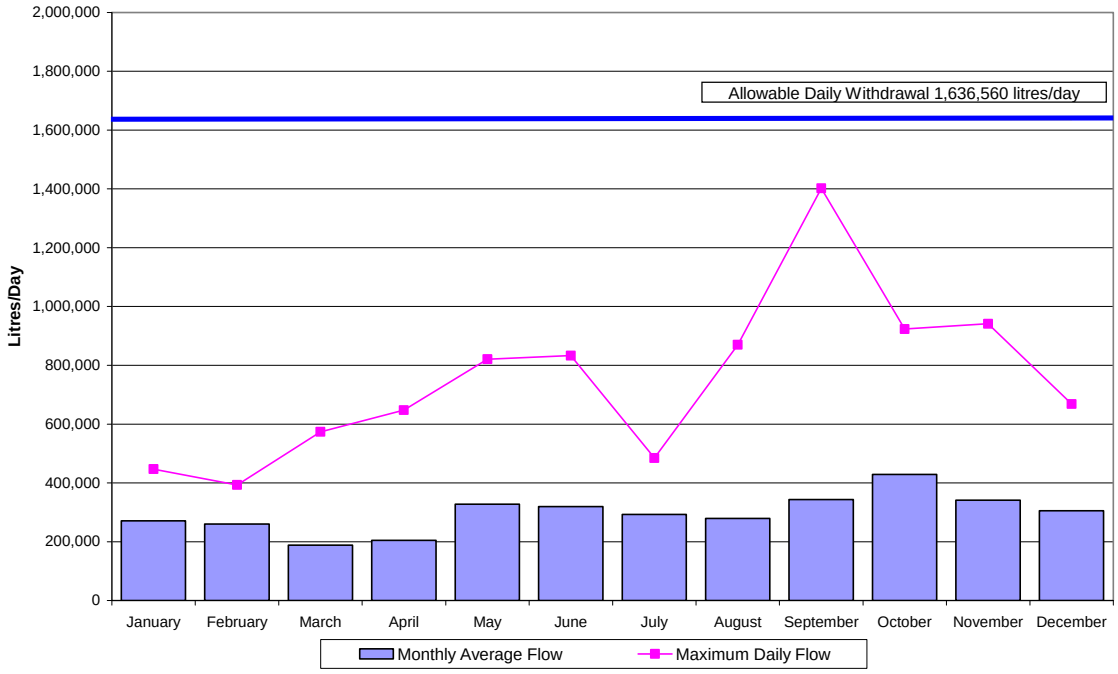
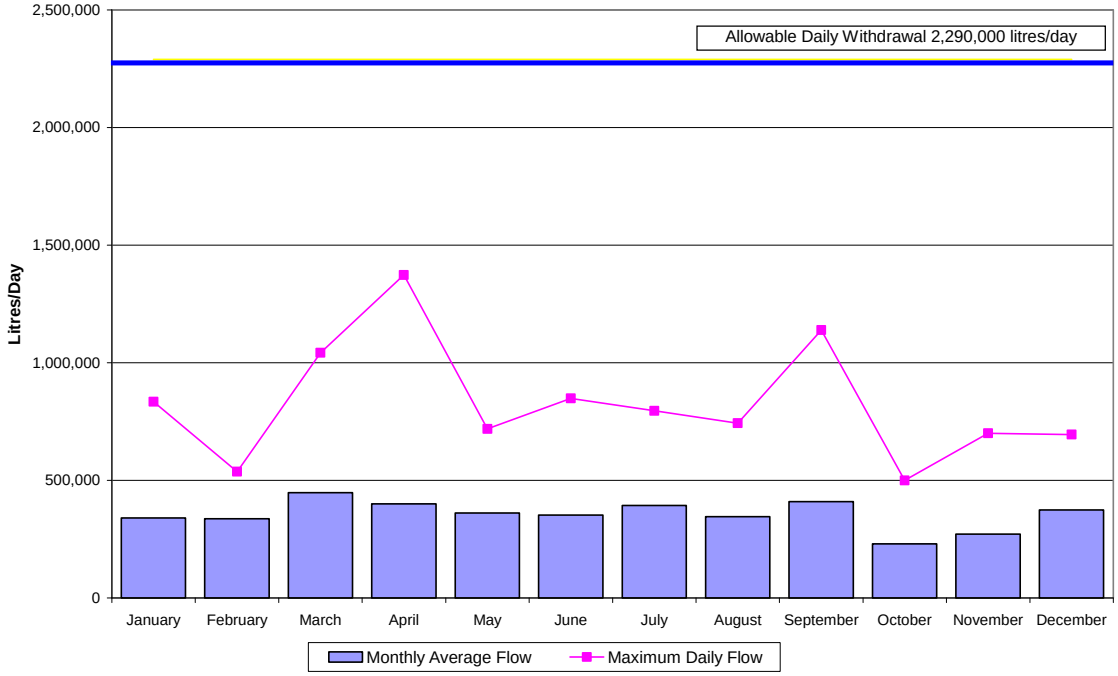



**Figure 64: Schomberg Well No. 3**
**Monthly Average Flow and Average Daily Flow 2008**




The actual volumes of water taken from the Schomberg production wells in the period of January 1 – December 31, 2008 did not exceed the permitted daily withdrawal volumes.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 65 and 66.

**Figure 65: Schomberg Well No. 2**
**Daily Instantaneous Peak Flow 2008**

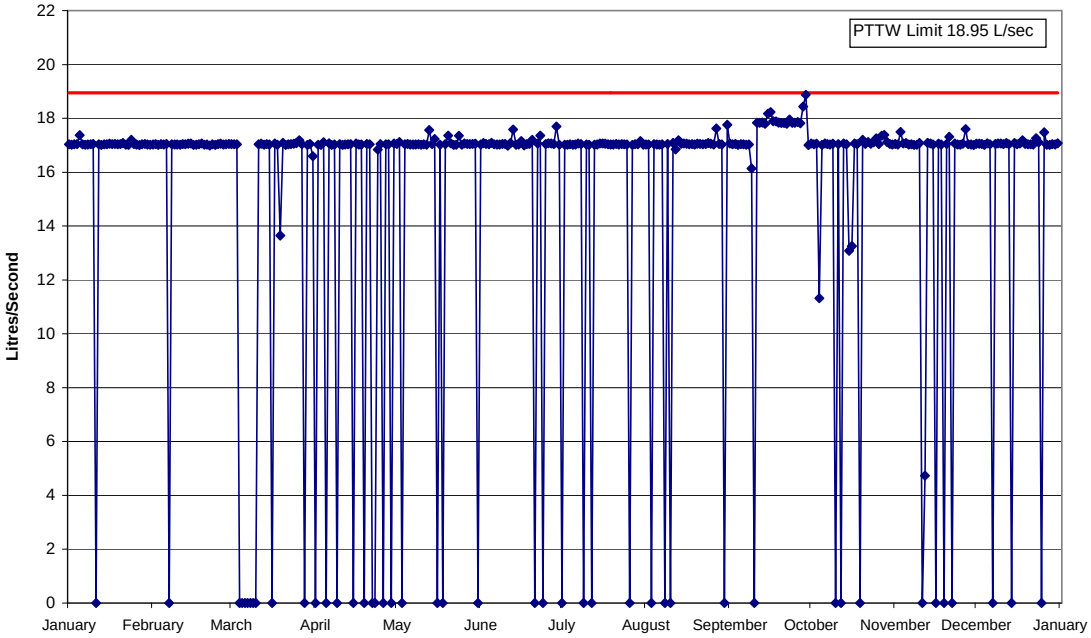
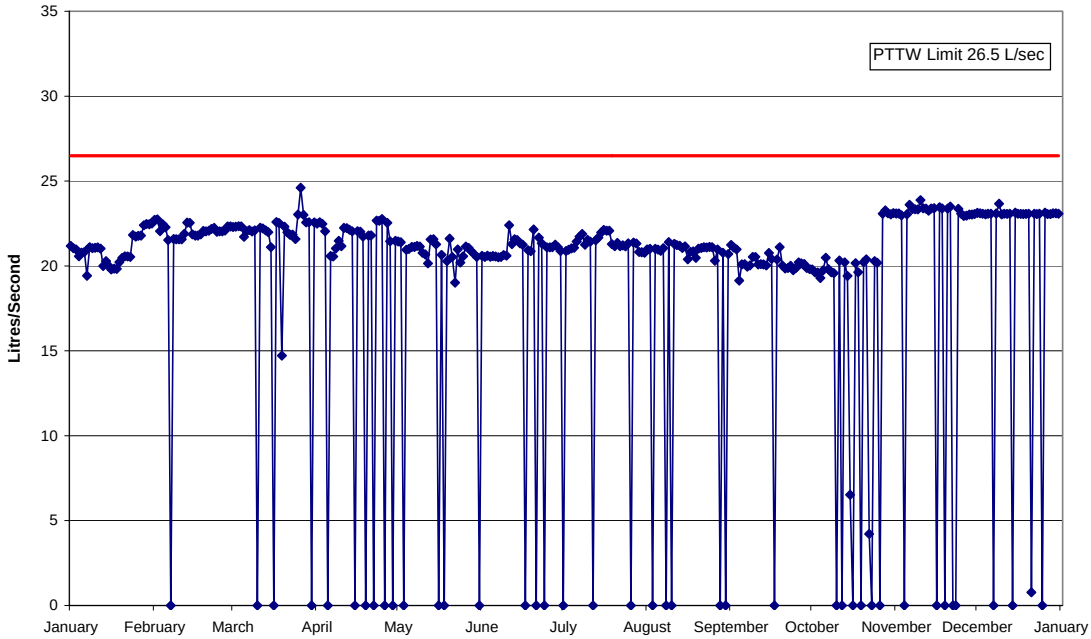



**Figure 66: Schomberg Well No. 3**
**Daily Instantaneous Peak Flow 2008**



## 2.12 Stouffville

York Region operates a water supply system to service Stouffville, Town of Whitchurch-Stouffville, under authority of a C of A issued by the MOE. The C of A includes reference to the PTTW also issued by the MOE. Details of the C of A and PTTW and other relevant classification information for the Stouffville Water Supply are presented in Table 34. All system upgrades required by the C of A have been completed.

### TABLE 34: Stouffville Water Supply – Summary of Approvals and Permit

| | |
|---|---|
| **Current Certificate of Approval Number:**<br>Issue Date: | 1547-784JGQ<br>January 8, 2008 |
| **Current Permit to Take Water Number:**<br>Issue Date:<br>Expiry Date: | 5722-74LPXE<br>June 29, 2007<br>June 30, 2012 |
| **MOE Waterworks Number:** | 220002333 |
| **System Classification:** | Water Distribution & Supply III (WD III)<br>Water Treatment I (WTI) |

#### 2.12.1 Water Taking

The PTTW for the Stouffville Water Supply System allows York Region to withdraw up to 14,238,720 litres per day from production wells 1, 2, 3, 5 and 6.

York Region monitors the water taking through flow meters placed downstream of each production well. Flow is monitored and alarmed on a continuous basis to ensure that the regulated flows are not exceeded.

#### 2.12.2 Measuring Points

Flow meters are in place downstream of each production well and record the instantaneous flow rate and total volume of water that has passed through the meter. The flow meters are calibrated annually to meet the monitoring conditions of the C of A.

Flow data is retrieved and stored using two methods which provides York Region with the opportunity to compare and contrast data, in the event one method should fail.

1. York Region staff manually record the flow rates and total flow data on regular operational visits to the well sites. Average flow rates are also calculated using records of total flow and number of operating pump hours. This ‘manual’ data was used to generate the maximum daily withdrawal and monthly average flow tables and figures.
2. The flow meters are also connected to the Supervisory Control and Data Acquisition (SCADA) system so that data can be monitored remotely and stored electronically. This data was used to generate the instantaneous peak flow rate figures.

### 2.12.3 Water Withdrawal

The total volume of water taken from the production wells of the Stouffville Water Supply system from January 1 – December 31, 2008 was 2,190,595,532 litres or 5,985,234 litres per day on average.

The maximum permitted daily water taking and the actual maximum recorded daily water taking are presented in Table 35.

**TABLE 35: Permitted and Actual Maximum Daily Withdrawal from the Stouffville Production Wells for January 1 – December 31, 2008**

| Location | Permitted Daily Withdrawal (Litres) | Actual Maximum Daily Withdrawal (Litres) | Percentage of Permitted Withdrawal During Peak Demand |
|---|---|---|---|
| Well 1 | 2,946,240 | 2,727,500 – August 13, 2008 | 92.6% |
| Well 2 | 2,946,240 | 2,766,375 – May 28, 2008 | 93.9% |
| Well 3 | 2,946,240 | 2,616,125 – July 10, 2008 | 88.9% |
| Well 5 | 2,289,600 | 1,845,250 – August 25, 2008 | 80.6% |
| Well 6 | 3,110,400 | 1,997,375 – May 25, 2008 | 64.2% |

The maximum permitted water withdrawal and the actual annual withdrawal recorded daily water taking are presented in Table 36.

**TABLE 36: Permitted and Actual Maximum Withdrawal from the Stouffville Production Wells for January 1 – December 31, 2008**

| Annual Permitted Withdrawal (Litres) | Actual Annual Withdrawal (Litres) | Percentage of Permitted Withdrawal |
|---|---|---|
| 5,197,132,800 | 2,190,595,532 | 42.1% |

The monthly average flow rates, maximum daily flow, and the permitted daily withdrawal are presented in Figures 67 through 71.

**Figure 67: Stouffville Well No. 1**
**Monthly Average Flow and Maximum Daily Flow 2008**

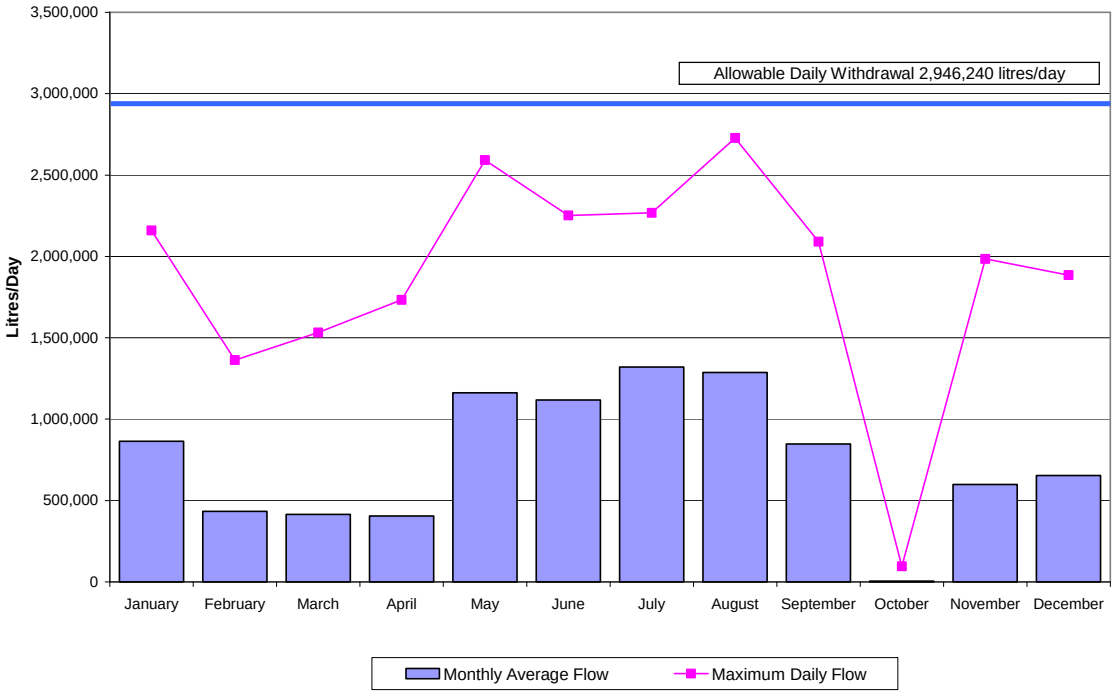



Figure 67 shows a reduced monthly average flow recorded for the months of October 2008. This reduction in flow due to the scheduled and unscheduled maintenance conducted on the well annually to improve the overall operation of the water system.

**Figure 68: Stouffville Well No. 2**
**Monthly Average Flow and Maximum Daily Flow 2008**

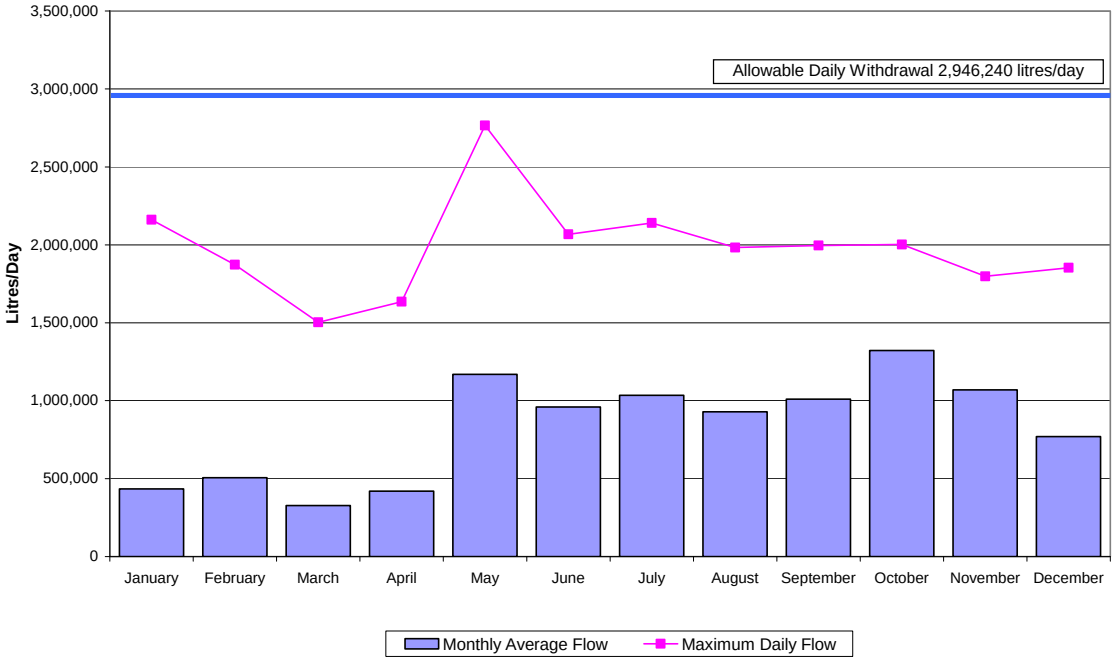


**Figure 69: Stouffville Well No. 3**
**Monthly Average Flow and Maximum Daily Flow 2008**

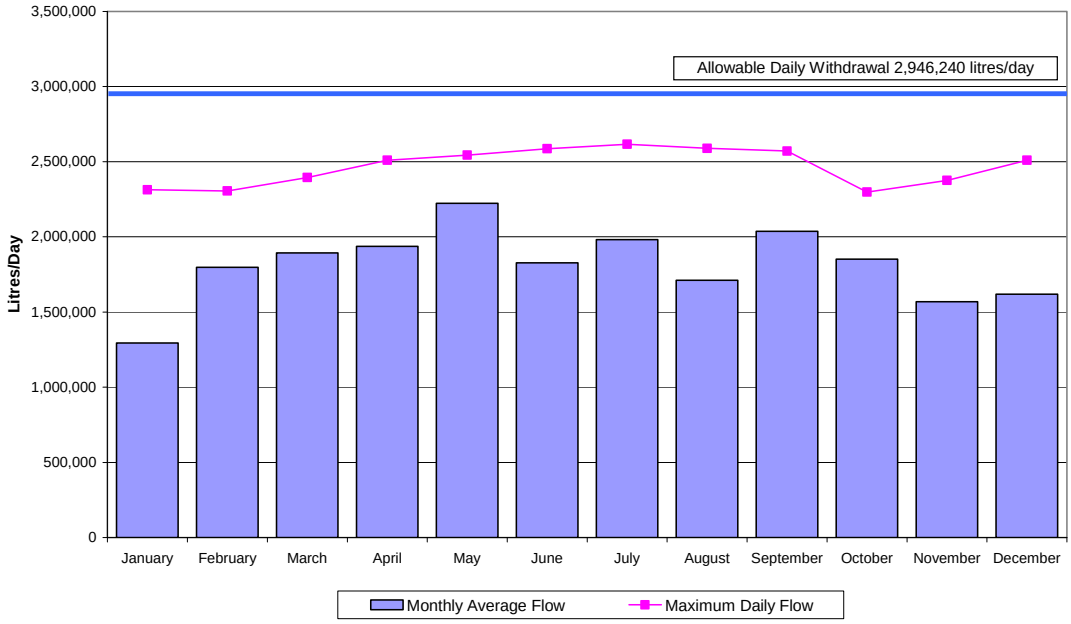



**Figure 70: Stouffville Well No. 5**
**Monthly Average Flow and Maximum Daily Flow 2008**

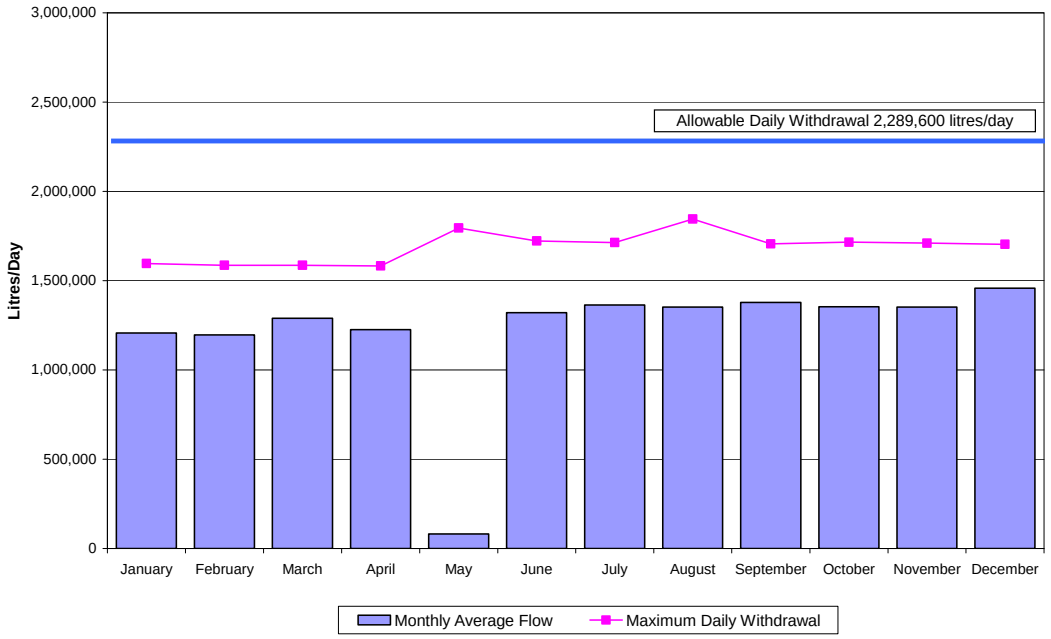
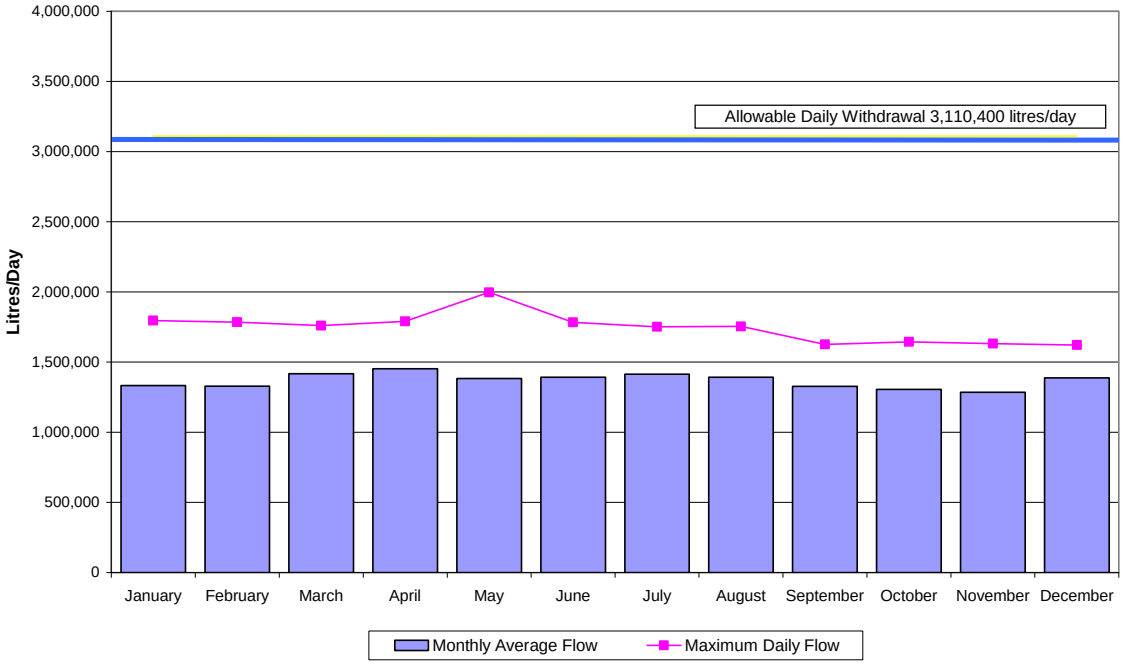



Figure 70 shows a reduced monthly average flow recorded for the month of May 2008. This reduction in flow due to the scheduled and unscheduled maintenance conducted on the well annually to improve the overall operation of the water system.

**Figure 71: Stouffville Well No. 6**
**Monthly Average Flow and Maximum Daily Flow 2008**




The actual volumes of water taken from the Stouffville production wells for January 1 – December 31, 2008 did not exceed the permitted daily withdrawal volumes.

The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 are presented in Figures 72 through 76.

**Figure 72: Stouffville Well No. 1**
**Daily Instantaneous Peak Flow 2008**

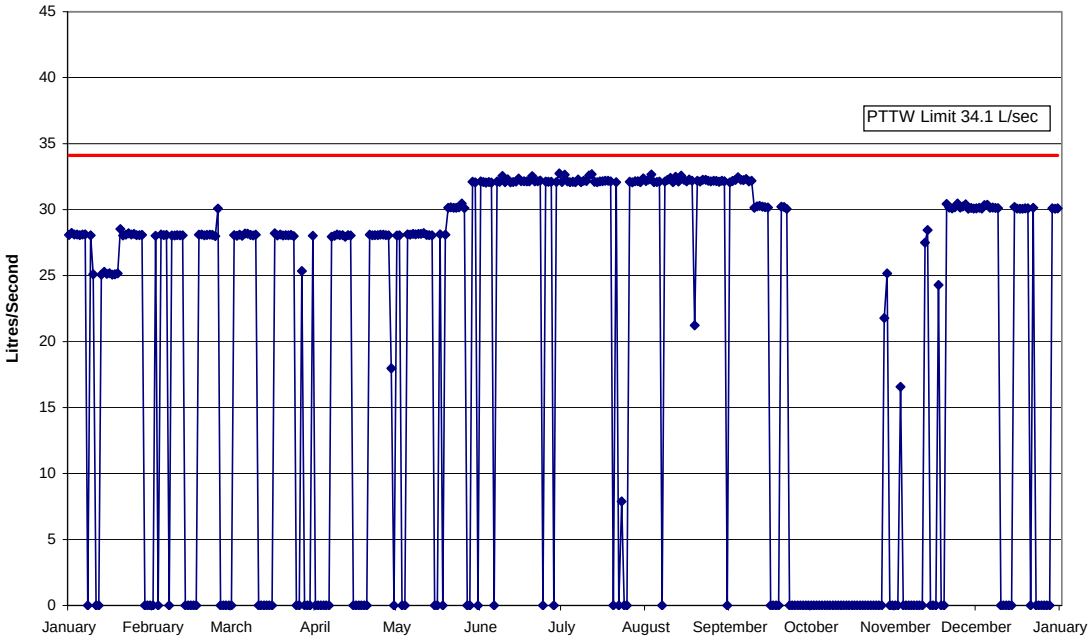



**Figure 73: Stouffville Well No. 2**
**Daily Instantaneous Peak Flow 2008**

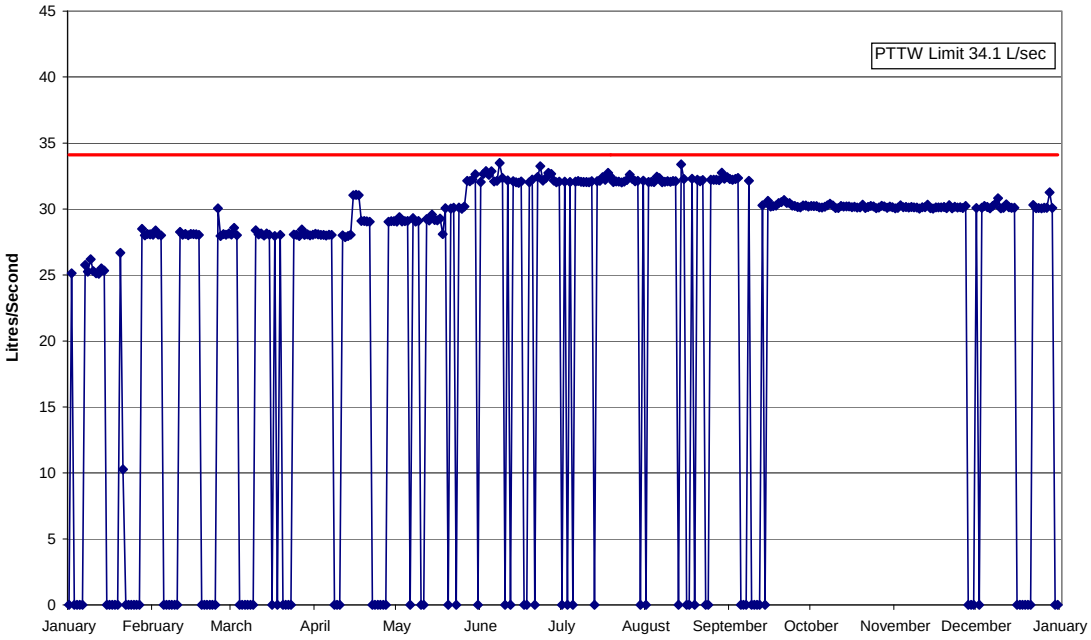


**Figure 74: Stouffville Well No. 3**
**Daily Instantaneous Peak Flow 2008**

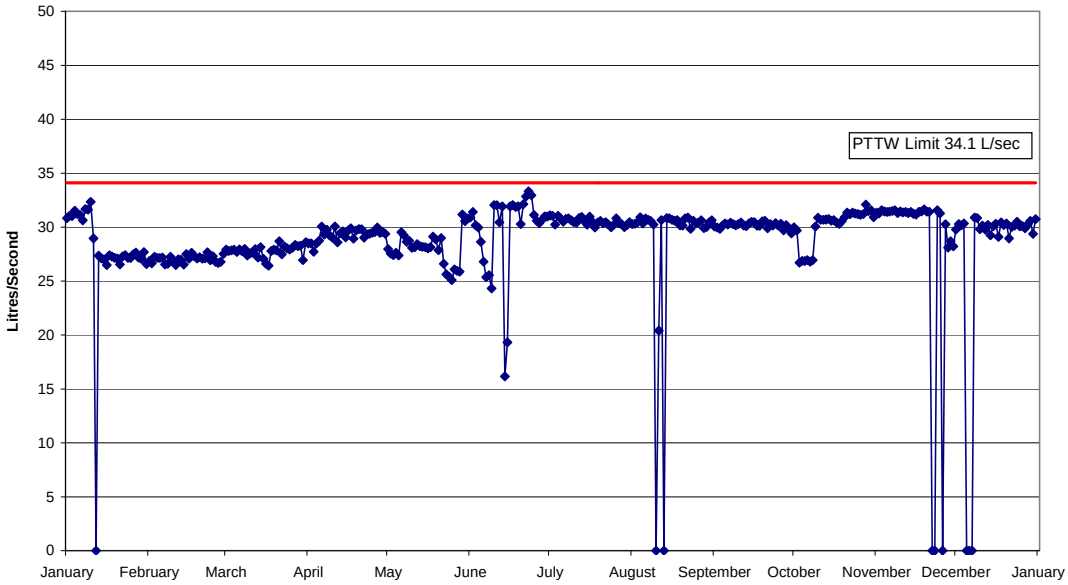



**Figure 75: Stouffville Well No. 5**
**Daily Instantaneous Peak Flow 2008**

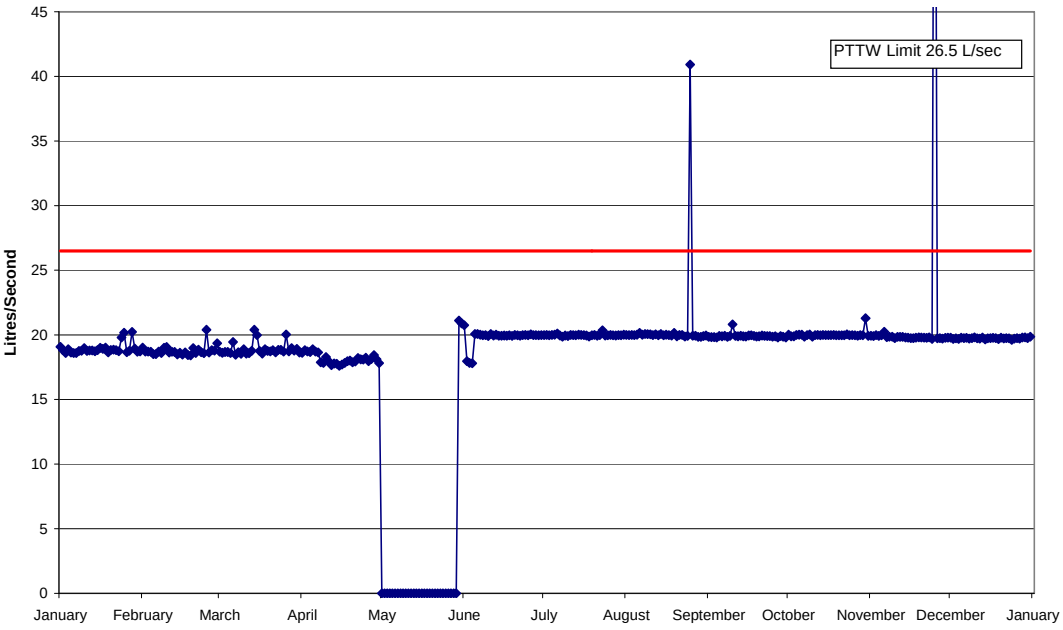



Figure 75 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure. The peak flow

rate shown out of range represent an instantaneous flow captured at the time of calibration.

**Figure 76: Stouffville Well No. 6**
**Daily Instantaneous Peak Flow 2008**

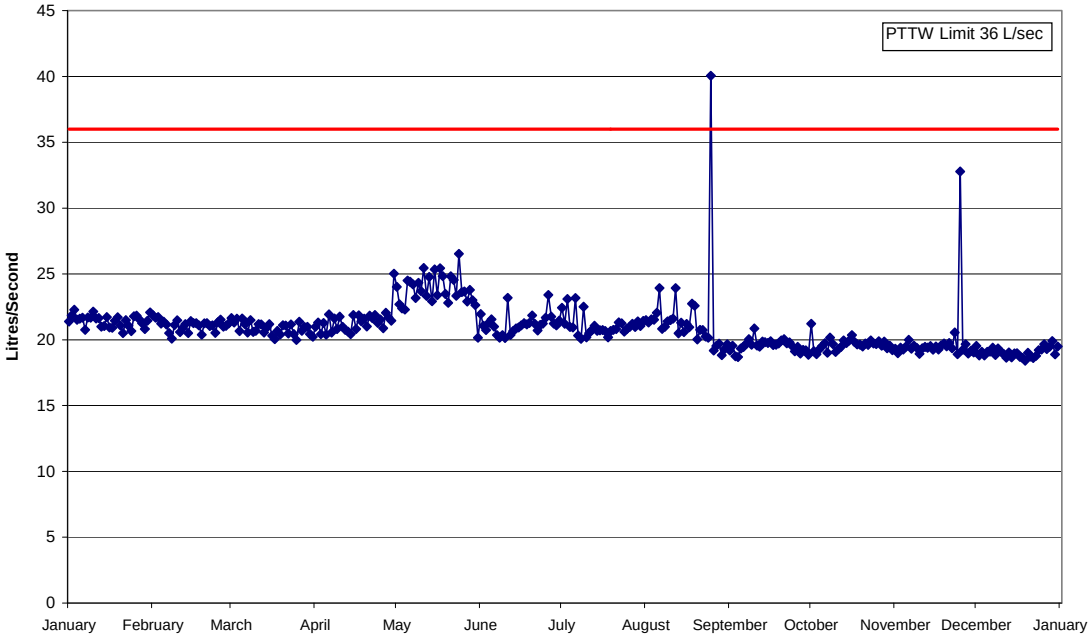


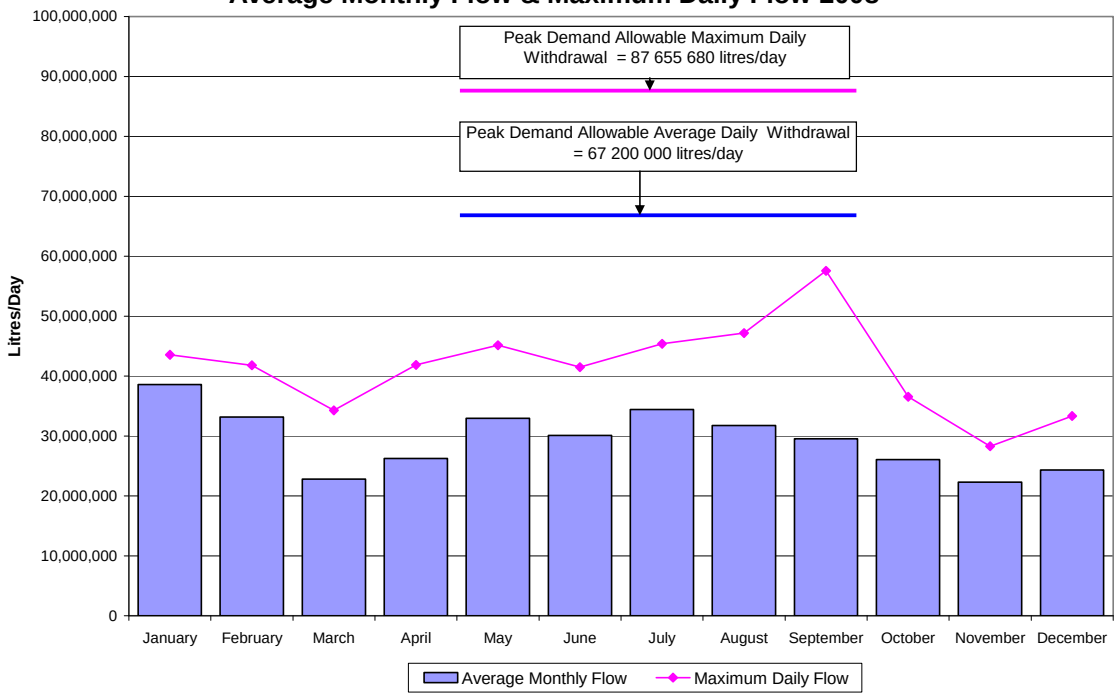

Figure 76 shows instantaneous peak flow rates recorded over the PTTW limit. All peaks were less than 5 minutes in duration and represent less than 1% of the total volume of water taken for the day. These peaks are associated with the initial start up of a pump by removing back pressure or a change in the distribution system pressure.

## 2.13 Yonge Street Aquifer

The Yonge Street Aquifer is the name given to the source aquifer that supplies groundwater to the communities of Aurora, Newmarket, Holland Landing, Queensville and Sharon. There are 20 wells in total that obtain water from the Yonge Street Aquifer, which are captured under PTTW 6623-68QQ6L.

Detailed information about the individual wells has been provided in separate sections and appears in this report under the 'Aurora' or 'Newmarket / East Gwillimbury' headings. However, for the purposes of understanding the cumulative impact of our water taking on the Yonge Street Aquifer, Figure 77 is provided below.

**Figure 77: Yonge Street Aquifer**
**Average Monthly Flow & Maximum Daily Flow 2008**




The total volume of water taken from the Yonge Street Aquifer from January 1 – December 31, 2008 was 10,744,745,886 litres or 29,357,229 litres per day on average.

As prescribed by the PTTW, during the peak demand period of May to September the permitted average daily water taking for the Yonge Street Aquifer is limited to 67,200,000 litres per day with a maximum withdrawal limit of 87,656,000. In 2008, the recorded average daily water taking was 31,776,186 litres per day with a maximum withdrawal of 57,553,781, below the limit prescribed in the PTTW.

As prescribed by the PTTW, the annual average daily water for the Yonge Street Aquifer is limited to 42,000,000 litres per day. In 2008, the recorded annual average daily water taking was 29,357,229 litres per day, below the limit prescribed in the PTTW.

The limits prescribed by the PTTW for the Yonge Street Aquifer during the Peak Demand Period are presented in Table 37 and 38.

**TABLE 37: Permitted and Actual Peak Demand Maximum Daily Withdrawal from the Yonge Street Aquifer for May 1 – September 30, 2008**

| Location | Permitted Maximum Daily Withdrawal May – September (Litres) | Actual Maximum Daily Withdrawal May – September (Litres) | Percentage of Permitted Maximum Daily Withdrawal During Peak Demand |
|---|---|---|---|
| YSA | 87,656,000 | 57,553,781 – September 29, 2008 | 65.7% |

**TABLE 38: Permitted and Actual Peak Demand Average Daily Withdrawal from the Yonge Street Aquifer for May 1 – September 30, 2008**

| Location | Permitted Average Daily Withdrawal May – September (Litres) | Actual Average Daily Withdrawal May – September (Litres) | Percentage of Permitted Average Daily Withdrawal During Peak Demand |
|---|---|---|---|
| YSA | 67,200,000 | 31,776,186 | 47.3% |

**TABLE 39: Permitted and Actual Annual Average Daily Withdrawal from the Yonge Street Aquifer for January 1 – December 31, 2008**

| Location | Permitted Annual Average Daily Withdrawal (Litres) | Actual Annual Average Daily Withdrawal (Litres) | Percentage of Permitted Annual Average Daily Withdrawal |
|---|---|---|---|
| YSA | 42,000,000 | 29,357,229 | 69.9% |

## 2.14 York Water System

York Region operates a water supply system to service the Town of Markham, the Town of Richmond Hill, the City of Vaughan, and parts of the Town of Aurora and Newmarket. The York Water System is classified as a 'Large Municipal System receiving water from a Large Municipal System'. It distributes water supplied from the City of Toronto and the Regional Municipality of Peel to the noted area municipalities. As such, it does not have a requirement for a PTTW. Although there is a Certificate of Approvals (C of A) issued by the MOE for the operation of the York Water System; the amount of water withdrawn for the system is limited to the amount set within the agreements between York Region, Region of Peel, and the City of Toronto.

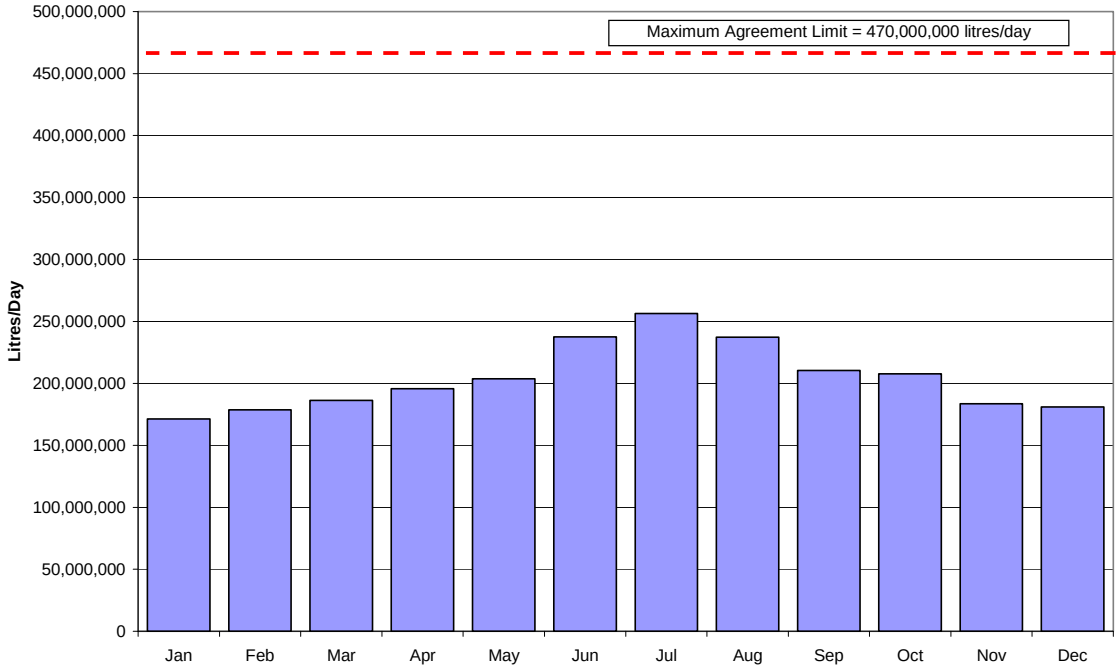
### 2.14.1 Toronto Water Supplied to York Region

The agreements between the City of Toronto and York Region (Toronto/York Water Supply Agreement) allows for a daily maximum of 470,000,000 litres per day or 470 megalitres per day in 2008.

The total volume of water supplied from Toronto to the York Water System for the reporting period of January 1 – December 31, 2008 was 204,126,333 litres per day. The system operated at 43.4% of the maximum withdrawal established in the operating agreement.

The total water supplied by Toronto to the York Water System monthly flow rates are presented in Figure 78.

**Figure 78: Toronto Supply Daily Average Flow 2008**



### 2.14.2 Peel Water Supplied to York Region

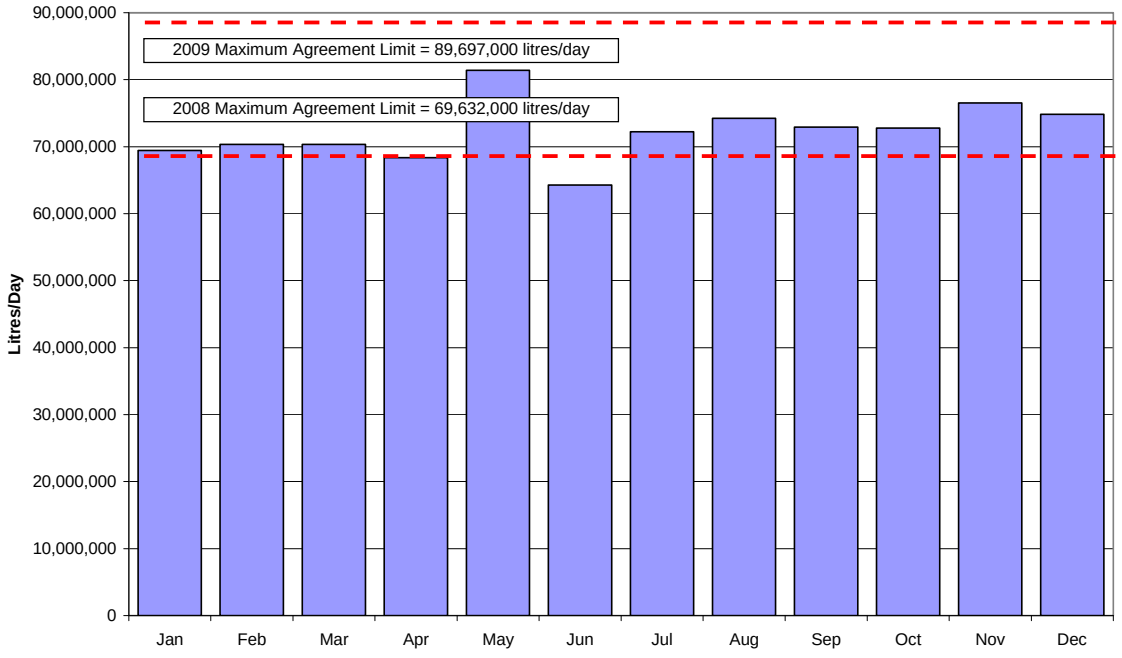
The agreement between the Region of Peel and York Region (Peel/York Water Supply Agreement) allows for the daily maximum of 69,632,000 litres per day or 69 megalitres per day in 2008.

The total volume of water supplied from Peel to the York Water System for the reporting period of January 1 – December 31, 2008 was 72,304,917 litres per day. The system operated at 1.04% above the maximum withdrawal established in the operating agreement.

To accommodate schedule production well maintenance and meet system demand for the Aurora water supply, additional water was supplied above the maximum permitted withdrawal as prescribed in the operating agreement. Operating above the maximum permitted withdrawal is acceptable and is not classified as a regulatory exceedence as prescribed in the operating agreement when agreed upon between York Region and the Region of Peel.

The total water supplied by Peel to the York Water System monthly flow rates are presented in Figure 79.

**Figure 79: Peel Supply Daily Average Flow 2008**




The monthly flow rates for each municipality served by the York Water System are presented in Figures 80 through 83.

**Figure 80: Markham Monthly Average Flow 2008**

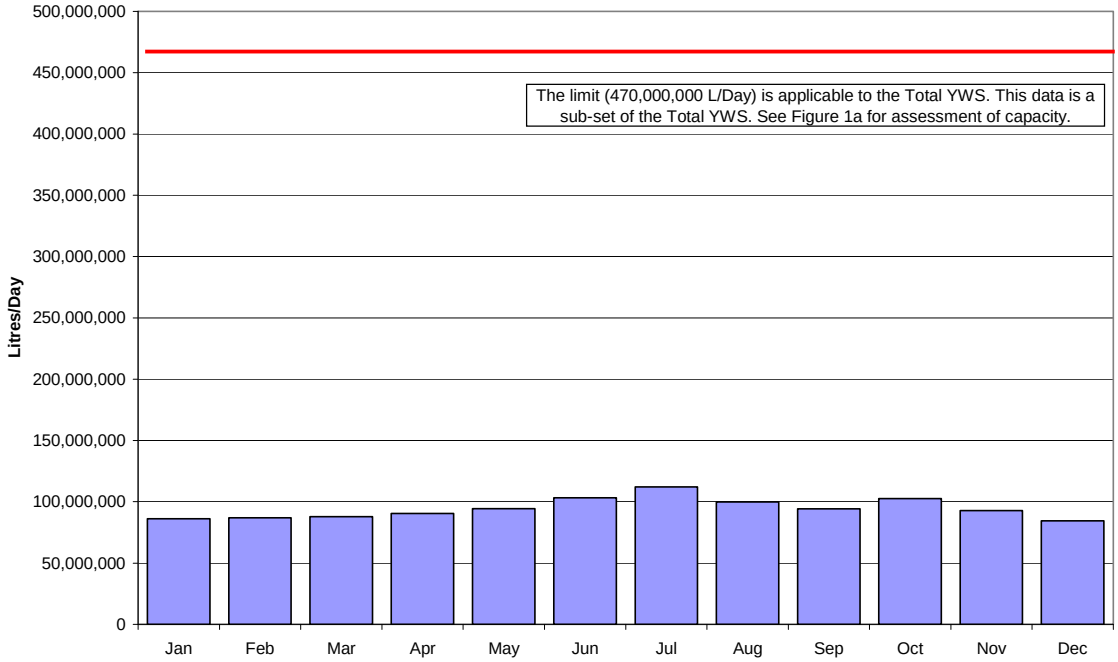



**Figure 81: Richmond Hill Monthly Average Flow 2008**

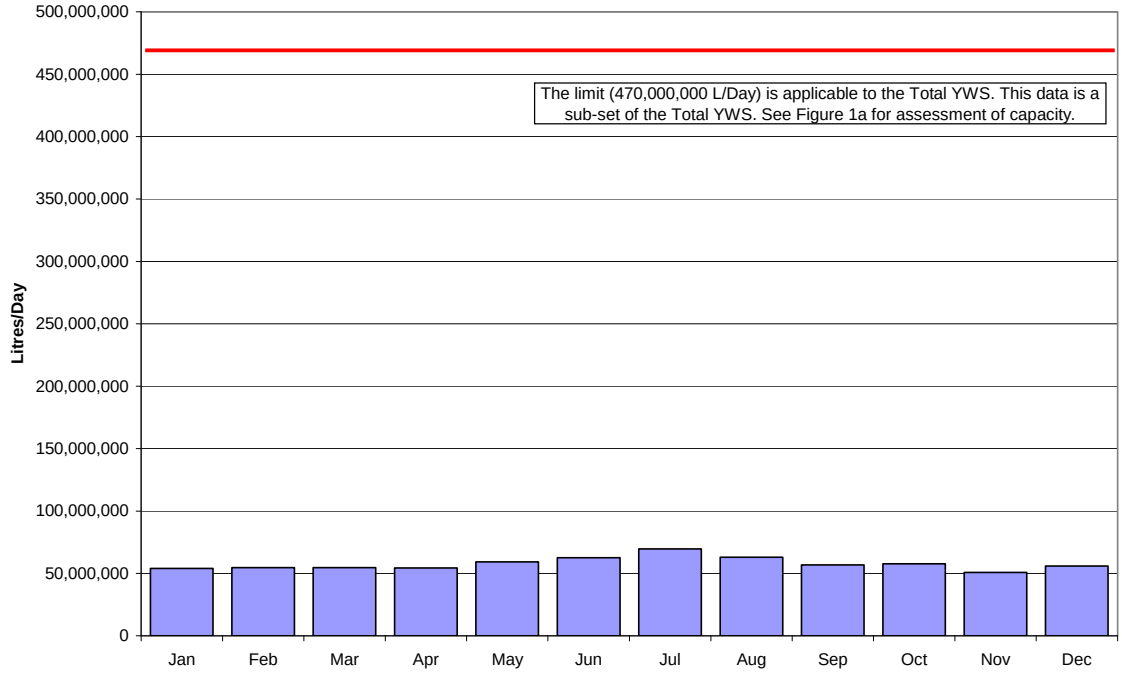


**Figure 82: Vaughan Monthly Average Flow 2008**

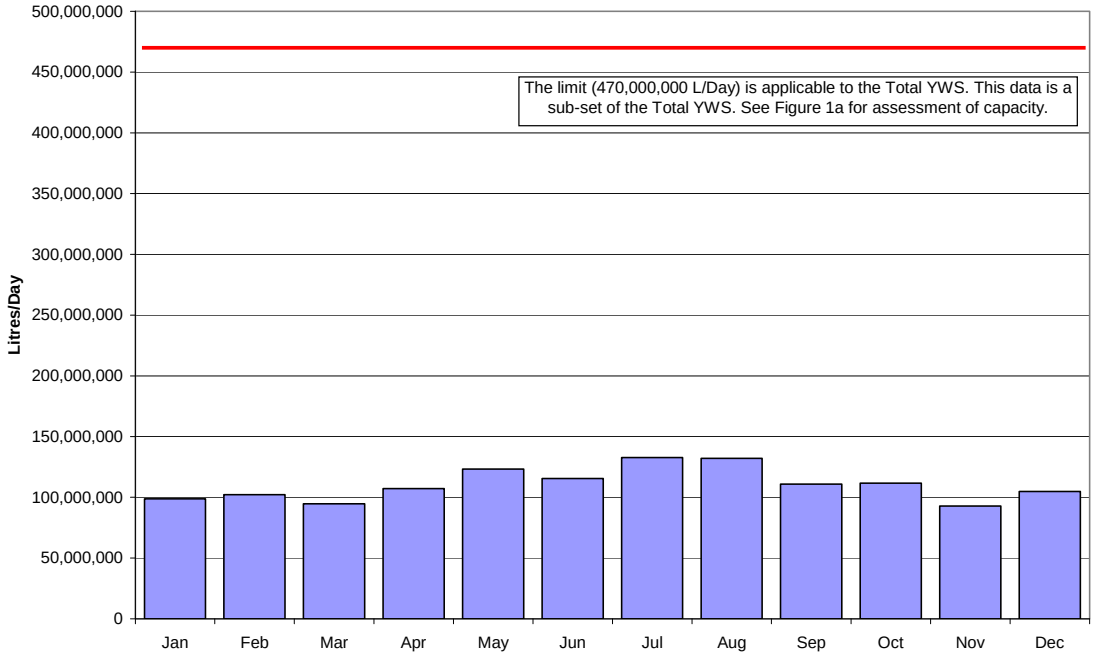
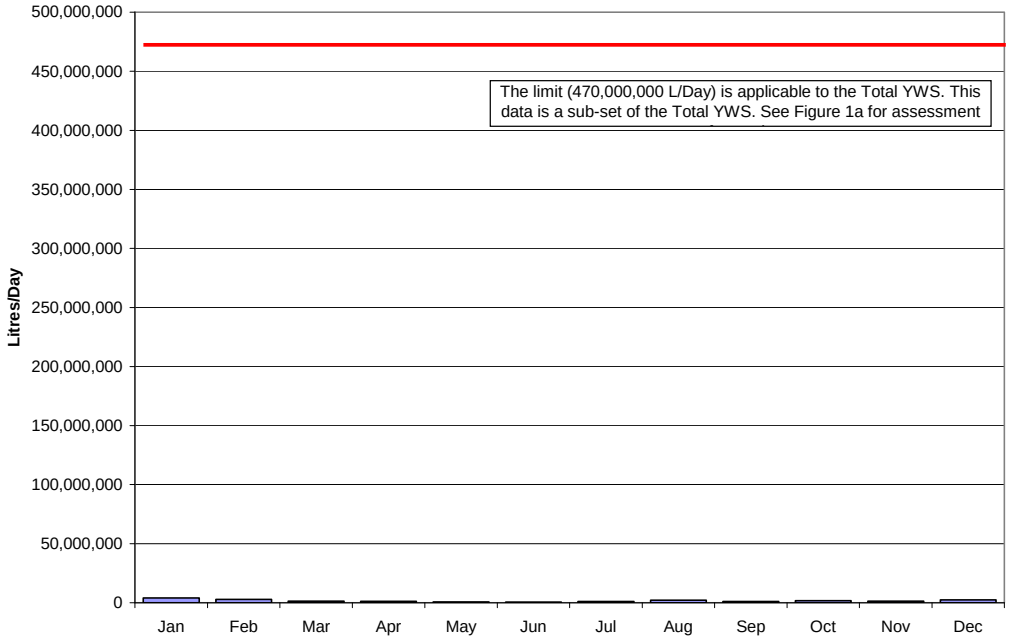



**Figure 83: Aurora Monthly Average Flow 2008**




The *'Daily Instantaneous Peak Flow (litres)'* for January 1- December 31, 2008 is reported for the York Water System because flow is dependant on the demand and limited only by the maximum withdrawal established in the Peel/York Water Supply Agreement and not a PTTW.