

## **Peel District School Board Water Smart Schools**

### **Project Summary**

In 2017 the Peel District School Board completed 15 equipment retrofits that has resulted in an estimated savings of 64,800L of water saved per day. These equipment retrofits were identified through a series of investigations that began with a high level look at water use across all PDSB schools and leveraged The Region of Peel's Indoor Water Assessment Program in order to take a closer look at individual schools.

Through this investigation the PDSB has gained valuable information on their schools water consumption trends and have developed a robust system to monitor water use on a continual basis.

### **Background**

The Peel District School Board (PDSB) serves approximately 154,000 students via 253 schools in Peel region. These schools vary in size, occupancy and types of facilities onsite, such as pools, sports fields and ice rinks.

As a part of the School Boards desire to reduce operational costs and engage in environmentally sustainable practices, staff in the Energy and Sustainability departed began a detailed investigation of water use across all schools.

As there are 253 schools in Peel, an in-depth look at all schools would demand endless staff time. In order to maximize efforts and identify schools with the highest potential for savings, staff utilized data from the centralized Utility Consumption Database; this database holds all utility data for each school based on billed information. Water data was extracted and compared to building size and occupancy

numbers at the school. A list was then created of top water using schools and these were the main target for the initial investigation.

A draw back to using billed data is that the granularity of the data is lacking. Some schools are billed monthly and some are billed quarterly which extends response times to abnormal water consumption. A leak may run for weeks before staff identify and fix it. To address this barrier, PDSB has also installed real-time interval meters at various schools, in addition to the collection and trending of billed data.

Real time interval meters allow continual monitoring of water use and can show minute by minute trending of water use at a particular location. This technology can connect staff to daily trends and pinpoint abnormal water use during certain times of the day. It can also send instantaneous notifications to staff via email of these abnormal water using events. Leaks can be fixed within days or hours, as opposed to weeks.

In addition to using internally available resources and staff, the Energy and Sustainability team also reached out externally for support. As PDSB schools are located in the Region of Peel, the PDSB engaged Peel's Water Efficiency Team to see what water efficiency programs and incentives were available to support this initiative.

The Region of Peel offers a number of water efficiency programs to support the industrial, commercial and institutional sectors in Peel.

### **Detailed description and results**

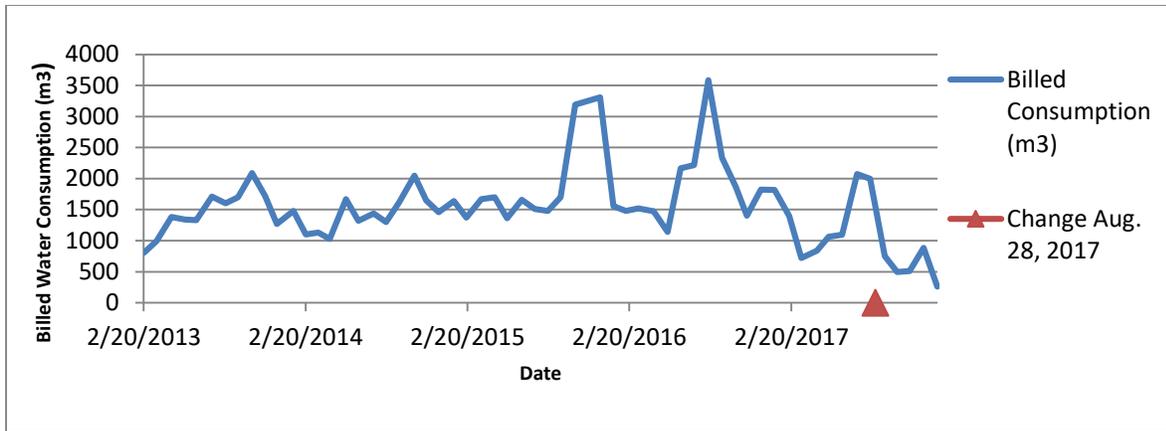
In 2016, a partnership with The Region's Water Efficiency Team enhanced the investigation by providing support to conduct water assessments at the top 5 water using schools as identified by PDSB. These assessments were school specific and identified water saving opportunities at the school level. Results of these assessments would then be used to identify similar water saving opportunities across all schools.

Through the course of the investigation one school stood out, Lincoln Alexander Secondary School. This school was identified as one of the top water using schools through billed data, and according to the interval metering data; Lincoln Alexander had a baseline water flow of 1072 L/hr. The source of this baseline water flow proved to be a mystery to PDSB staff, and plumbers; but after a thorough assessment provided by the Region of Peel and their retained water assessment consultant; it was identified as a failed temperature regulating valve on a walk-in freezer compressor. At the time of the assessment, this compressor was using 20.6 L/min of water continually. This equates to 29,664 L/day of water being used and an estimated \$25,011 per year to operate.

When maintained and operated according to specifications, water cooled walk-in fridge/freezer condensers can consume an estimated 2,510 L/day of once through water. In the case of Lincoln Alexander where the temperature regulating valve failed, this caused an increase in water consumption by more than 27,000 L/day. As a result of these findings, other secondary schools were checked for water cooled walk-in fridge/freezer compressors and a plan was put in place to replace these units with air cooled models.

In 2017, PDSB replaced 15 water cooled compressors with air cooled units and saved an estimated 64,804 L/day of water or \$54,639 per year in operating costs associated with water. The full cost of the replacement was \$129,376 and with a \$15,000 incentive from the Region of Peel (\$1000 per unit replaced), the payback for the project is 2.1 years.

See figure 1 below to illustrate the downward trend in water consumption at Lincoln Alexander Secondary School after the replacement in August 2017.



**Figure 1.** Lincoln Alexander Secondary School Billed Water Consumption

Through the course of this exercise PDSB has created a system of collecting, analyzing and monitoring water use at schools based on billed and real time interval metering data, thereby saving water and cutting operating costs. It has also paved the way for the installation of real time interval metering technology across all schools.