Oshawa®

Information Memo

To:	City Council
From:	Warren Munro, HBA, RPP, Commissioner, Development Services Department
Item Number:	INFO-19-330
Date:	November 26, 2019
Subject:	Province's 2017 Air Quality Report
File:	A-2312-0020

1.0 Purpose

The purpose of this report is to provide an overview of the Province's Air Quality in Ontario 2017 Report (the "2017 Report") and in particular, data recorded at the monitoring station located at Durham College (2000 Simcoe Street North) in Oshawa. The 2017 Report was released on June 21, 2019.

To view a copy of the 2017 Report, visit: https://www.ontario.ca/document/air-quality-ontario-2017-report.

In 2014, staff was directed to provide Council with relevant information on the results and trends analysis by the Province from the Air Quality Index monitoring station located at Durham College in Oshawa, as it becomes available.

2.0 Input From Other Sources

A copy of INFO-19-330, dated November 26, 2019 and the 2017 Report will be provided to the Oshawa Environmental Advisory Committee for information.

3.0 Analysis

3.1 Provincial Air Quality Monitoring

The Province, through the Ministry of Environment, Conservation and Parks (M.E.C.P.) operates a network of 39 Air Quality Index (A.Q.I.) monitoring stations across Ontario.

There is only one station in Durham Region, which is located at Durham College in Oshawa. Prior to 2005, this station was located at Ritson Road Public School.

A.Q.I. monitoring stations generally measure six common pollutants, which can have adverse effects on human health and the environment at high levels. These six pollutants are:

- Ground level ozone;
- Fine particulate matter;
- Nitrogen dioxide;
- Carbon monoxide;
- Sulphur dioxide; and
- Total Reduced Sulphur Compounds.

Information from the A.Q.I. monitoring stations is used by the M.E.C.P. to:

- Inform the public about Ontario's ambient air quality;
- Assess Ontario's air quality and evaluate long-term trends;
- Identify areas where criteria and standards are exceeded;
- Provide the basis for air quality policy/program development;
- Determine the impact from U. S. and Canadian sources on Ontario's air quality;
- Provide scientists with air quality data to link environmental and human health effects to pollution levels; and
- Provide smog advisories for public health protection.

The M.E.C.P.'s monitoring is continuous and can be viewed on a real time basis (hourly summaries) on the M.E.C.P.'s website.

A link to hourly air quality summaries in Ontario is provided on Oshawa's website (https://www.oshawa.ca/residents/air-quality.asp).

Overall, air quality in the Province has improved significantly due to a substantial decrease in harmful pollutants that are emitted by the transportation and industrial sectors. This improvement can be attributed to:

- The phase out of coal fired generating stations;
- Emissions trading regulations, (O. Reg. 397/01 and O. Reg. 194/05);
- Setting new and updated air standards regulations (O. Reg. 419/05);
- Regulating industrial emissions through site specific standard compliance options under O. Reg. 419/05;
- Emissions controls at Ontario smelters; and
- Drive Clean testing of vehicle emissions.

It is important to note that the 2017 Report includes references the Canadian Ambient Air Quality Standards (C.A.A.Q.S.), which were published by the Canadian Council of Ministers of the Environment in May 2013 to replace the Canada-wide standards for Ozone and Fine particulate matter. The purpose of the new non-binding standards is to promote continuous improvement in air quality monitoring.

With respect to Oshawa, the 2017 Report indicates that the Oshawa A.Q.I. station monitors three pollutants: Ozone, Fine particulate matter and Nitrogen dioxide.

The Air Quality in Ontario 2011 Report noted that the other pollutants in the Provincial Program (i.e. Sulphur dioxide, Carbon monoxide, and Total Reduced Sulphur Compounds.) have reached background levels and are no longer required to be monitored at the Oshawa station.

3.1.1 Ozone in Oshawa

3.1.1.1 Sources of Ozone

Naturally occurring Ozone in the stratosphere (10 to 40 kilometres above the earth's surface) is beneficial, as it shields the earth from harmful ultraviolet radiation. However, ground-level Ozone is a colourless, odourless gas that is formed when nitrogen oxides and volatile organic compounds react in the presence of sunlight. Ground-level Ozone can negatively impact human and environmental health, with the highest levels typically occurring on hot, sunny days from May to September, between noon and early evening.

3.1.1.2 Health and Environmental Effects

Ozone can irritate the eyes and respiratory tract, and prolonged exposure to Ozone can result in chest tightness, coughing and wheezing in more sensitive groups. Children who are active outdoors during the summer are particularly at risk of adverse health effects. In addition, people with pre-existing respiratory disorders (e.g. asthma and chronic obstructive pulmonary disease) are also at higher risk. Ozone is also associated with increased hospital admissions and premature death.

Ozone may cause agricultural crop loss each year in Ontario, with noticeable damage to leaves, crops, garden plants and trees, especially during the summer months.

3.1.1.3 Oshawa Trends

In 2017, Oshawa experienced a mean Ozone level of 27.9 parts per billion (p.p.b.), with 99% of all daily values less than or equal to the 2013 C.A.A.Q.S. standard of 63 p.p.b. Only 3 hours in 2017 exceeded the ambient air quality criteria for Ozone established by the C.A.A.Q.S.

Overall, the 10 year trend indicates that Ozone levels have increased 3.3% in Oshawa from 27 p.p.b. in 2008 to 27.9 p.p.b. in 2017. Over the past 5 years however, mean Ozone levels have fluctuated as shown below:

- 27.2 p.p.b. in 2013;
- 27.2 p.p.b. in 2014;
- 26.2 p.p.b. in 2015;
- 27.2 p.p.b. in 2016; and
- 27.9 p.p.b. in 2017.

3.1.2 Fine Particulate Matter in Oshawa

3.1.2.1 Sources of Fine Particulate Matter

Fine particulate matter in Ontario is mainly comprised of nitrates, sulphates, organic matter and particle-bound water, and is used to describe the complex mixture of small solid particles and liquid droplets in the air. This includes aerosols, smoke, fumes, dust, fly ash and pollen. In 2017, Fine particulate matter emitted in Ontario was produced by the following sources:

- 56% from the residential sector;
- 13% from transportation/road vehicles;
- 13% from miscellaneous sources;
- 9% from other industrial sources;
- 8% from smelters/primary metals; and
- 1% from the cement and concrete industry.

3.1.2.2 Health and Environmental Impacts

Fine particulate matter can have various negative health effects on the body because the smaller particles can penetrate deep into the respiratory and cardiovascular systems, causing irritation, coughing and difficulty breathing. People with asthma, heart or lung disease, as well as children and older adults, are considered the most sensitive to the effects of Fine particulate matter.

In addition, past Air Quality in Ontario Reports have noted that Fine particulate matter is also associated with environmental impacts such as corrosion, soiling, damage to vegetation and reduced visibility.

3.1.2.3 Oshawa Trends

In 2017, Oshawa experienced a mean Fine particulate matter level of 5.9 micrograms per cubic metre ($\mu g/m^3$), with 99% of all daily values less than 22 $\mu g/m^3$. The maximum Fine particulate matter level after 24 hours was 22 $\mu g/m^3$, which is below the 2013 C.A.A.Q.S. maximum 24 hour reference level of 28 $\mu g/m^3$.

This report does not show the 10 year trend of Fine particulate matter due to monitoring methodology changes in 2013. However, annual mean Fine particulate matter levels have decreased since 2013, as shown below:

- 7.4 $\mu g/m^3$ in 2013;
- 7.7 $\mu g/m^3$ in 2014;
- 7.5 $\mu g/m^3$ in 2015;
- 5.9 $\mu g/m^3$ in 2016; and
- 5.9 $\mu g/m^3$ in 2017.

3.1.3 Nitrogen dioxide in Oshawa

3.1.3.1 Sources of Nitrogen Dioxide

Nitrogen dioxide is a reddish brown gas with a pungent odour, which transforms in the atmosphere to form gaseous nitric acid and nitrates. It plays a major role in atmospheric reactions that produce ground-level Ozone, which is a major component of smog. Main sources of Nitrogen dioxide emissions include industrial processes, transportation and utilities.

3.1.3.2 Health and Environmental Impacts

Individuals suffering from asthma or bronchitis have an increased sensitivity to Nitrogen dioxide and it can also irritate the lungs and lower resistance to respiratory infections.

Nitrogen dioxide chemically transforms into nitric acid in the atmosphere and when deposited contributes to the acidification of lakes and soils. Nitric acid can also corrode metals, fade fabrics and degrade rubber and damage trees and crops.

3.1.3.3 Oshawa Trends

In 2017, Oshawa experienced a mean Nitrogen dioxide level of 6.4 p.p.b., with 99% of the daily values less than or equal to 29 p.p.b. The highest 24 hour Nitrogen dioxide level was 31 p.p.b., which is well below the 2013 C.A.A.Q.C. reference level of 100 p.p.b.

Overall, the 10 year trend indicates that Nitrogen dioxide levels have decreased 24.7% from 2008. However, over the past 5 years the annual mean Nitrogen dioxide levels have fluctuated as shown below:

- 5.9 p.p.b. in 2013;
- 6.8 p.p.b. in 2014;
- 6.6 p.p.b. in 2015;
- 6.3 p.p.b. in 2016; and
- 6.4 p.p.b. in 2017.

4.0 Financial Implications

There are no financial implications associated with this Report.

5.0 Relationship to the Oshawa Strategic Plan

This Report advances the Environmental Responsibility goal of the Oshawa Strategic Plan.

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