

## Pollutants Measured in 2017

- Sulphur dioxide (SO<sub>2</sub>)
- Nitrogen dioxide (NO<sub>2</sub>)
- Total reduced sulphur (TRS)
- Particulate matter less than 2.5 µm in diameter (PM<sub>2.5</sub>)
- Total suspended particulate (TSP)
- 9 metals
- 107 volatile organic compounds (VOCs)
- 8 polycyclic aromatic hydrocarbons (PAHs)

Pollutants were compared to Ontario's Ambient Air Quality Criteria (AAQC) or similar benchmark values. AAQC are levels of pollutants set to protect health and the environment.

## Key Results

### Comparison to AAQC

Levels of most air pollutants measured at the Aamjiwnaang station in 2017 met Ontario's AAQC or similar benchmark values.

Similar to 2016, only benzene and benzo(a)pyrene were measured above Ontario's AAQC.

New AAQC for SO<sub>2</sub> came into effect in March 2018. SO<sub>2</sub> was always below the old 1-hour AAQC but occasionally above the new 1-hour AAQC.

### Changes to Pollutant Levels

Levels of SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>2.5</sub>, TRS, and benzo(a)pyrene at the Aamjiwnaang station have been going down.

Levels of benzene at the Aamjiwnaang station have been stable.

## Changes in Pollutant Levels from 2009 to 2017

These graphs show how pollutant levels changed from 2009 to 2017. The years 2016 and 2017 are shown in black to highlight the most recent change.

### Pollutant Levels Have Gone Down

#### TRS ↓ 59% since 2009



#### SO<sub>2</sub> ↓ 51% since 2009



#### NO<sub>2</sub> ↓ 50% since 2009



#### Benzo(a)pyrene ↓ 46% since 2009



#### PM<sub>2.5</sub> ↓ 31% since 2009



### Pollutant Levels Have Been Stable

#### Benzene



### Change in Pollutant Levels Could Not Be Assessed\*

#### TSP



\* In January 2015 the ministry started using a more efficient TSP monitor which measured higher levels of TSP. The change in TSP levels from 2009 to 2017 cannot be assessed because of this change in monitor.

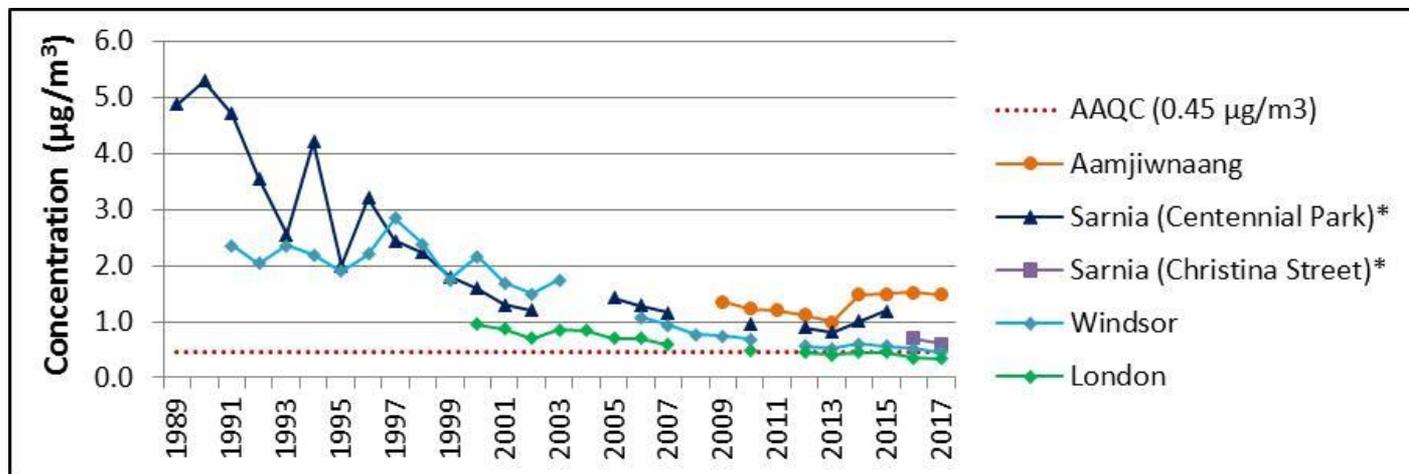
# Benzene

Benzene levels in Sarnia are about one third of what they were 25 years ago.

Benzene levels at the Aamjiwnaang station are higher than other communities in Southwestern Ontario.

The annual average concentration was approximately three times the AAQC but is still within the range of negligible risk.

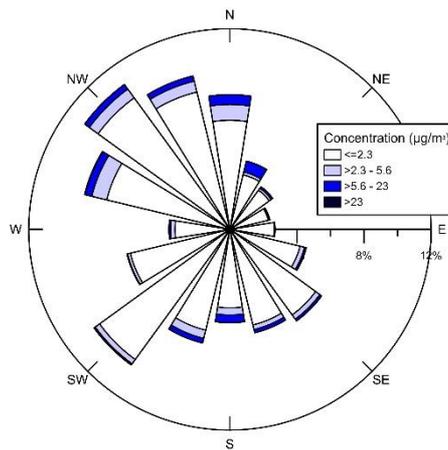
## Historic yearly benzene levels at Aamjiwnaang and other communities in Southwestern Ontario



\*In 2016 the Sarnia (Centennial Park) station was moved about 1 km to the northeast, which is further away from industrial sources. Benzene sampling at the new location (Christina Street) began at the end of April 2016, so the average level for 2016 may not be representative of the full year.

## 1-hr benzene levels by wind direction

The figure to the right shows the benzene levels that were measured when the winds were blowing from different directions. It shows that benzene levels were the highest when the winds were blowing from the north through the west, and from the south. These are the directions of the main industrial sources of benzene in the area.



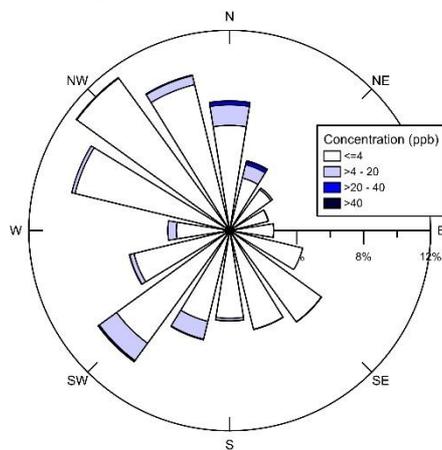
In 2017, 79% of samples were below the 24-hour AAQC. This is comparable to 82% in 2016.

The largest benzene emitters are now registered to a technical standard that came into effect in July 2016. This technical standard requires the facilities to reduce emissions by using better technologies and best-practices. Many of these requirements started to be phased-in after 2017.

# Sulphur Dioxide

## 1-hr SO<sub>2</sub> levels by wind direction

The figure to the right shows the SO<sub>2</sub> levels that were measured when the winds were blowing from different directions. It shows that SO<sub>2</sub> levels were the highest when the winds were blowing from the north to north-northeast. This is the direction of some industrial sources of SO<sub>2</sub> in the area.



SO<sub>2</sub> levels were measured below the old AAQC (1-hour, 24-hour, and annual) that were in effect throughout 2017.

The new 1-hour AAQC of 40 ppb came into effect in March 2018. SO<sub>2</sub> levels were measured above this value for 7 hours of the year (0.1% of the time).

The yearly average SO<sub>2</sub> level was measured to be 1.2 ppb. This is below the new annual AAQC of 4 ppb that came into effect in March 2018.

# Benzo(a)Pyrene

The annual average concentration was approximately three times the AAQC but is still within the range of negligible risk.

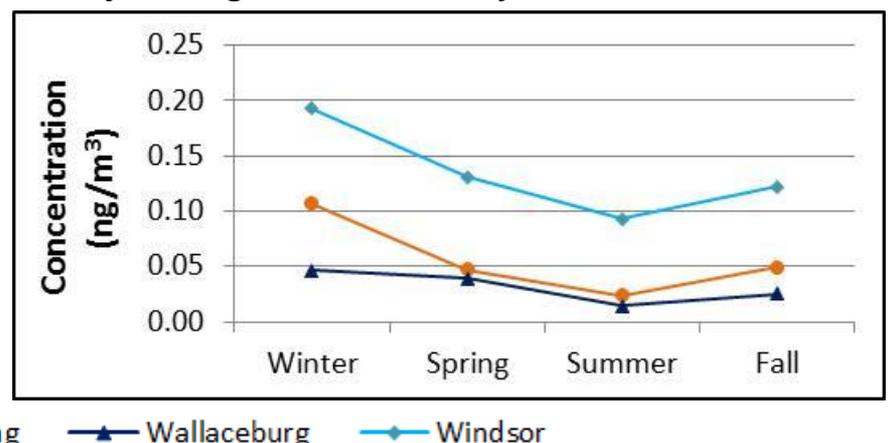
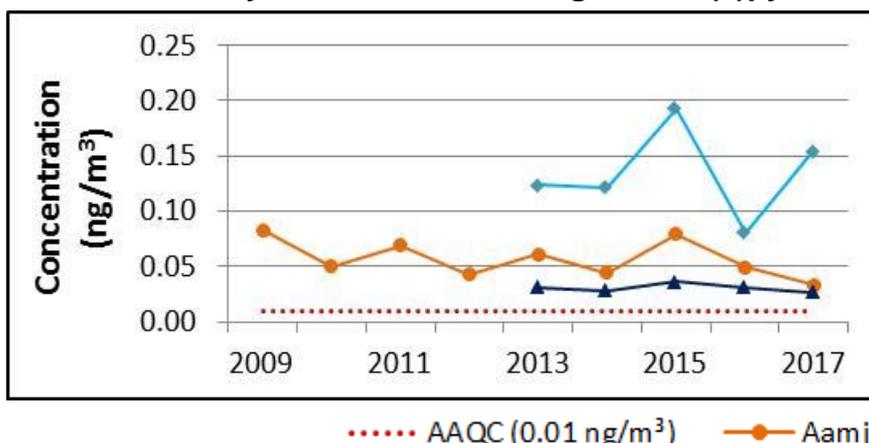
Levels at the Aamjiwnaang station are lower than in Windsor (urban) but higher than in Wallaceburg (rural).

In 2017, 83% of samples were below the 24-hour AAQC. This is an improvement from 65% in 2016.

Average levels are highest in the winter and lowest in the summer, possibly due to the effects of home heating.

According to data from Environment and Climate Change Canada, home firewood burning accounts for 85% of Ontario-wide emissions of benzo(a)pyrene.

## Yearly and seasonal average benzo(a)pyrene levels at Aamjiwnaang and other nearby communities



..... AAQC (0.01 ng/m<sup>3</sup>)    —●— Aamjiwnaang    —▲— Wallaceburg    —◆— Windsor

Data represents concentrations only at the location of the air monitoring station in 2017 and may not represent actual exposures of individuals moving about the community.

Data from the Aamjiwnaang monitoring station, and other area air monitoring stations, are available at: [cleanairsarniaandarea.com](http://cleanairsarniaandarea.com)