



Aamjiwnaang Air Monitoring Station Air Quality Results

September 27, 2012

Ministry of the Environment

Station Summary

- Report summarises 2011 results.
- Compares results to 2009 & 2010.
- Station continued to run well.
- Polycyclic Aromatic Hydrocarbons (PAH) data has been delayed due to laboratory equipment failure.

Station Monitoring Capabilities

Air Quality Index Pollutants

- Pollutants that make up the Air Quality Index (AQI)
- Hourly measurements
- Compared to AQI breakpoints

Parameter	Units	Very Good	Good	Moderate	Poor	Very Poor
Sulphur Dioxide (SO ₂)	ppb	0-79	80-169	170-250	251-1999	>1999
Nitrogen Dioxide (NO ₂)	ppb	0-50	51-110	111-200	201-524	>524
Ground-level Ozone (O ₃)	ppb	0-23	24-50	51-80	81-149	>149
Total Reduced Sulphur (TRS)	ppb	0-5	6-10	11-27	28-999	>999
Carbon Monoxide (CO)	ppm	0-12	13-22	23-30	31-49	>49
Fine Particulate Matter (PM _{2.5})	µg/m ³	0-11	12-22	23-45	46-90	>90

AQI Pollutants

- Carbon Monoxide never reached measurable levels.
- SO₂ & NO₂ were always at *Very Good* levels.
- TRS was rated *Good* 0.04% of the time and *Very Good* for the rest.
- Fine particulate reached *Poor* levels 0.15% of the time, and *Moderate* levels another 6.44%. The rest of the time levels were either *Good* or *Very Good*.
- Ozone reached *Poor* levels 0.33% of the time, and *Moderate* levels a further 5.59%. The remaining time was *Good* or *Very Good*.

Suspended Particulate & Metals

- On site collection, off site analysis
- Every 6th day
- Evaluated against 24-hour Ambient Air Quality Criteria (AAQC)

24-Hour Ambient Air Quality Criteria			
Substance	AAQC ($\mu\text{g}/\text{m}^3$)	Substance	AAQC ($\mu\text{g}/\text{m}^3$)
Suspended Particulate	120	Nickel	0.22
Vanadium	2	Copper	50
Chromium	0.5	Zinc	120
Manganese	0.4	Cadmium	0.025
Iron	4	Lead	0.5

Suspended Particulate & Metals

- The average particulate concentration was up slightly from the previous year, though still well below the AAQC.
- Measured levels for TSP and metals were all well below the AAQC with one exception.
- One TSP measurement exceeded the AAQC but the ministry lab labelled this as uncertain and it did not agree with results from the continuous monitor
- Some metals were detected too infrequently to calculate an average.
- Averages for all others and most maximum values were lower than those of the previous year.

Volatile Organic Compounds

- Measured two different ways.
- Hourly measurements on Gas Chromatograph/Mass Spectrometer (GC/MS).
- 24-Hour measurement every 12th day with an evacuated canister.
- GC/MS gives information on hourly variations and comparison with wind direction.
- Canister gives better detection limit because of longer exposure and looks at many more compounds.

Volatile Organic Compounds - Canister

- Volatile Organic Compounds (VOC)
- One 24 hour sample every 12th day
- Analysis at Environment Canada lab
- Compared to 24-hour AAQC
- 160 compounds measured
- 47 compounds have 24-hour AAQC

VOC - Canister

Name	24 Hour AAQC ($\mu\text{g}/\text{m}^3$)	Name	24 Hour AAQC ($\mu\text{g}/\text{m}^3$)	Name	24 Hour AAQC ($\mu\text{g}/\text{m}^3$)	Name	24 Hour AAQC ($\mu\text{g}/\text{m}^3$)
Freon113	800000	Cyclohexane	6100	1,2,4-Trichloro benzene	400	Ethylene	40
Freon114	700000	Freon11	6000	Tetrachloro ethylene	360	Naphthalene	22.5
Freon12	500000	Chloroethane	5600	Chloromethane	320	Trichloroethylene	12
Freon22	350000	Propylene	4000	1,3,5-Trimethylbenzene	220	1,3-Butadiene	10
1,1,1-trichloroethane	115000	1,2-Dichloropropane	2400	1,2,4-Trimethylbenzene	220	1,1-Dichloroethylene	10
1-Decene	60000	Toluene	2000	1,2,3-Trimethylbenzene	220	Ethylene dibromide	3
Acetylene	56000	Bromo methane	1350	Dichloromethane	220	Carbon tetrachloride	2.4
1-Octene	50000	Ethylbenzene	1000	1,1-Dichloroethane	165	Benzene	2.3
1,2-Dichlorobenzene	30500	m and p-Xylene	730	trans-1,2-Dichloroethylene	105	1,2-Dichloroethane	2
Heptane	11000	o-Xylene	730	cis-1,2-Dichloroethylene	105	Vinyl chloride	1
Hexane	7500	Styrene	400	1,4-Dichlorobenzene	95	Chloroform	1
Methyltertbutylether	7000	iso-Propylbenzene	400	Bromoform	55		

VOC - Canister

- Overall, results were similar to previous years; some higher, some lower.
- Other stations in the southern Ontario were not operated due to changes at Environment Canada.
- Only benzene exceeded an AAQC, and only on one occasion.
- Benzene also exceeded its annual AAQC.

Volatile Organic Compounds - Hourly

- Volatile Organic Compounds (VOC)
- One sample per hour, analysis on site
- Compared to AAQC

Substance	24 Hour AAQC (ppb)	Substance	24 Hour AAQC (ppb)	Substance	24 Hour AAQC (ppb)
Propylene	2209	Hexane	2022	Ethyl benzene	218
Chloromethane	147	Chloroform	0.19	m- & p-Xylene	159
1,3-Butadiene	4	Cyclohexane	1684	o-Xylene	159
Carbon disulphide	100	Benzene	0.68	Styrene	89
Acrylonitrile	0.26	Toluene	504		

VOC- Hourly

- Overall, most values were slightly higher than the previous year.
- 1,3-butadiene showed 1 exceedance of new 24-hour AAQC.
- Benzene exceeded the 24-hour AAQC 26 times but was below the annual AAQC using this method.

Polycyclic Aromatic Hydrocarbons (PAH)

- The Ministry of the Environment's trace organic lab had a significant equipment failure resulting in a delay in PAH analysis.
- Analytical results are expected by year end.

Conclusions

- Overall, the results are similar to previous year. Other than fine particulate and ozone, AQI pollutants are predominantly low and resemble results from nearby communities.
- TSP and metals show good levels.
- VOC results are similar to previous year.
- PAH results are not yet available.
- Exceedances of the AAQC were measured for two substances.