

ANNUAL AMBIENT MONITORING REPORT FOR PETROLEUM REFINING – INDUSTRY STANDARD

The air monitoring program assesses annual benzene concentrations along the Suncor refinery's perimeter using passive diffusive monitoring technology which has been approved by the MECP. Samples are taken continuously over a two-week period and the results are posted within 60 days of sample collection on our Suncor Sarnia Refinery website.

In 2024 our annual average from all 12 perimeter monitoring locations was 1.47 ug/m3. The statistical analysis with our three year benzene measurement baseline is included in this 2024 annual report. The full results from the 2024 monitoring program can be found below along with the map of the property line monitoring locations.

Annual Average for each station:

	2024
	Annual Average - Benzene (ug/m3)
STN-1	2.25
STN-2	2.13
STN-3	1.48
STN-4	2.07
STN-5	1.34
STN-6	1.23
STN-7	1.08
STN-8	1.04
STN-9	1.26
STN-10	0.94
STN-11	1.56
STN-12	1.24

Following three full calendar years (2018-2020) of monitoring, a three-year benzene measurement baseline was determined for each monitoring location. This baseline has been updated annually based on the measurements from the previous three calendar years. The updated baseline from the monitoring period (2022-2024) can be found below.

For the monitoring period from 2022-2024 the results are as follows:

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12
Sum	1.05	0.96	0.81	0.97	1.22	1.72	0.99	1.44	2.02	2.43	2.75	0.75
Std. Dev Sq	0.013469	0.0123	0.01	0.01	0.02	0.02	0.01	0.02	0.03	0.03	0.04	0.01

These results are based on the MECP formula in paragraph 4 of section 61 of the Technical Standards to Manage Air Pollution – Petroleum Refining.

$$S^2 = [\sum (x_i - X)^2] / (m-1)$$

Where,

S is the standard deviation;

m is the number of two-week average concentrations recorded in paragraph 1;

x_i is each value translated in paragraph 2; and

X is the value calculated in paragraph 3.

A statistical comparison to the baseline was performed for each monitor based on measurements from the previous calendar year. If there is any location with a statistically significant increase from the baseline, further analysis will be conducted to assess for potential actions to prevent, minimize or reduce the risk of future statistically significant increases in annual benzene concentrations.

The statistical comparison to the baseline for the 2024 PLM results showed there was no statistical significant increase.

	T - Value											
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12
Calculated T - Value	-0.829	-0.195	-0.726	1.405	-1.520	-0.853	-0.944	-0.773	0.136	0.018	0.630	-0.657
Degree of freedom corresponding T value for comparison	3.646	3.551	3.551	3.551	3.551	3.551	3.646	3.646	3.646	3.646	3.646	3.551

Based on 2024 monitored data, all calculated T-Value's for each station were lower than the corresponding T-value in Table 6-62 of the technical standard

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