



2023 Annual Ambient Monitoring Report for Petroleum Refining – Industry Standard

Technical Standards to Manage Air Pollution: Petroleum Refining - Industry Standard (PRIS),
Ontario Regulation (O. Reg.) 419/05

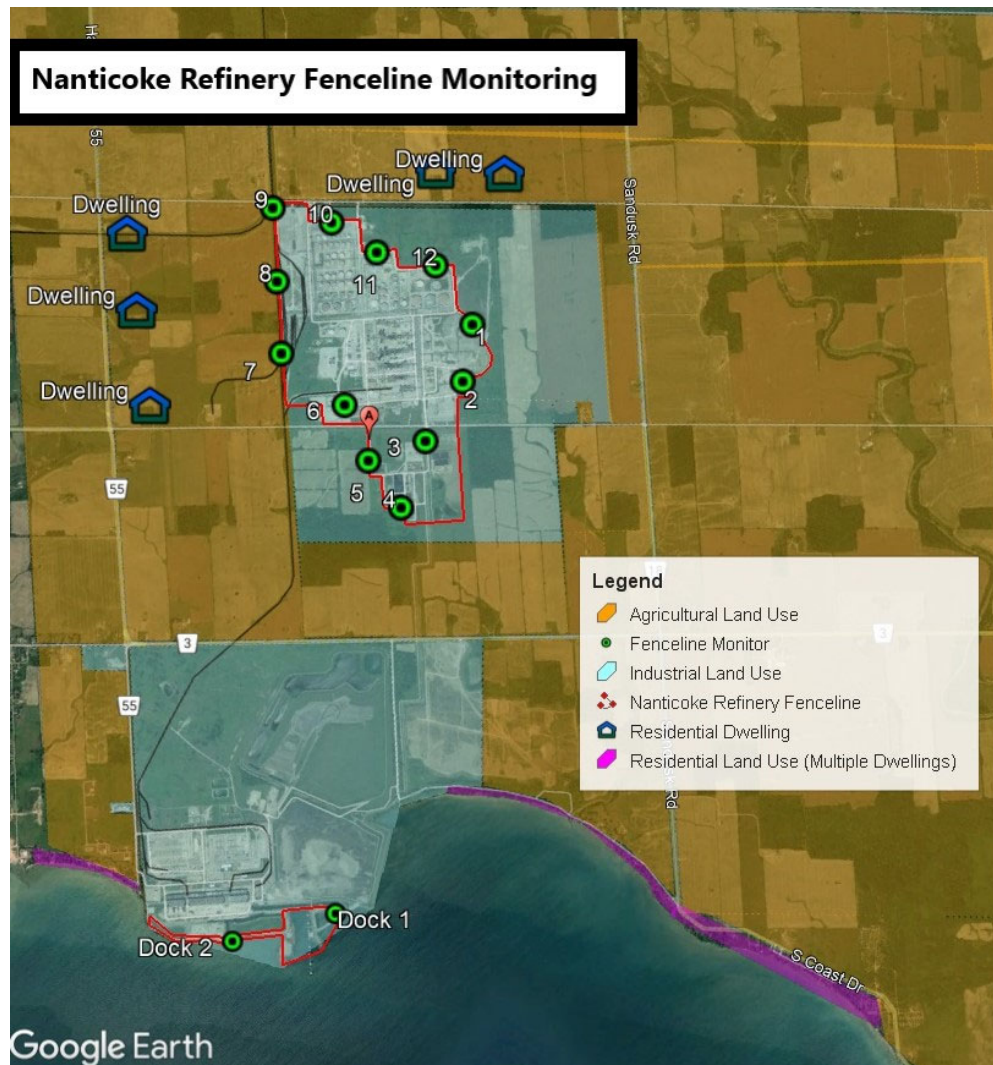
Part X – Complaints, Records and Reporting, Subsection 65(2)

Nanticoke Refinery, Imperial Oil

March 31, 2024

This report was prepared in accordance paragraph 6 of PRIS subsection 65(2).

- i. The following map shows the location of each monitoring station required by subsection 60(1), the information required by clause 60(4)(d), and other topographical information including any nearby water bodies, roadways and adjacent land uses. Residential dwellings within a 1km radius of the Nanticoke Refinery's fenceline are shown on the map. There are no health care facilities, senior citizen's residences, childcare facilities or educational facilities within a 10km radius of the Nanticoke Refinery's fenceline.



ii. A) Please see Table A-1 for the information required by subsection 60(6).

Table A-1 2023 Benzene Sampling Information and Results for each Monitor

Station ID		1-FLARE	2-SPHERE	3-WWTP	4-WWTP	5-WWTP	6-FIREHALL	7-RAIL	8-RAIL	9-TERMINAL	10-TANKS	11-TANKS	12-TANKS	13-DOCK1	14-DOCK2
Location (Lat, Long)		(42.8360, -80.0406)	(42.8324, -80.0403)	(42.8283, -80.0423)	(42.8240, -80.0431)	(42.8264, -80.0466)	(42.8295, -80.0496)	(42.8318, -80.0558)	(42.8361, -80.0576)	(42.8406, -80.0594)	(42.8404, -80.0542)	(42.8392, -80.0499)	(42.8390, -80.0451)	(42.7988, -80.0408)	(42.4745, -80.2566)
Date of Deployment/ Date of Retrieval/ Results (ug/m ³)															
22-December-2022	5-January-2023	1.9	0.7	1.1	0.74	1	0.86	0.86	1.2	0.78	3	3	3	1.2	1
5-January-2023	19-January-2023	1	0.69	0.7	1.9	0.75	0.84	1.3	1.3	0.52	1.1	1.3	1.3	1	0.62
19-January-2023	2-February-2023	2.3	1	0.84	1.2	1.2	0.73	0.79	0.9	0.68	1.7	1.9	2	0.88	0.62
2-February-2023	16-February-2023	1.9	1.2	1.4	0.9	1.2	0.97	0.81	1.1	0.82	3.3	2.3	4.5	1.5	0.64
16-February-2023	2-March-2023	1.1	0.99	1	0.96	0.89	0.85	1.3	1.6	0.58	1.4	1.2	2	0.95	0.73
2-March-2023	16-March-2023	0.77	1	0.86	2.5	0.84	0.95	1.3	1.3	0.49	1.1	0.78	1.4	1.3	0.51
16-March-2023	30-March-2023	1.9	0.97	1.3	0.96	0.9	0.99	1.3	1.2	0.58	2.8	2.3	4.6	0.59	0.78
30-March-2023	13-April-2023	1.2	0.92	1.6	1	1.3	1.1	1.3	1.4	0.8	3.6	2	3.9	1	0.46
13-April-2023	27-April-2023	1.1	0.7	0.78	1.2	1	1	1.2	1.6	0.56	2.6	2.4	3.5	0.56	0.88
27-April-2023	11-May-2023	0.69	0.6	0.88	1.3	1.2	0.8	1	1.5	0.53	2	1.4	2.1	1.6	0.92
11-May-2023	25-May-2023	0.98	0.93	1.5	1.2	0.61	0.98	1.4	2.2	0.44	2.7	1.6	2.5	0.39	0.42
25-May-2023	8-June-2023	0.53	0.59	1.1	2.4	1.4	1.5	2.2	2.2	0.55	1.8	1.2	1.3	0.71	1.8
8-June-2023	22-June-2023	1.1	1	1.2	1	0.87	0.81	1.2	2	0.60	2	1.4	1.6	0.94	0.46
22-June-2023	6-July-2023	1.4	1.3	2.4	1.4	2.3	1.5	1.2	1.6	1.1	4.3	3.1	2.6	1.4	0.86
6-July-2023	20-July-2023	1.6	1.1	2.2	2.0	1.8	1.5	1.2	1.0	0.57	3.2	2.6	2.4	1.4	0.79
20-July-2023	3-August-2023	1.4	1.2	2.2	1.3	0.92	1.0	0.79	0.89	0.47	4.7	2.9	2.8	3.2	0.67
3-August-2023	17-August-2023	1.3	1.3	1.6	2.3	0.72	0.77	0.95	1.6	0.52	3.6	2.2	1.7	1.9	0.79
17-August-2023	31-August-2023	1.6	1.1	1.2	2.8	1.2	1.1	1.5	1.9	0.69	3.0	2.2	1.9	0.63	0.67
31-August-2023	14-September-2023	1.2	1.1	1.9	3.2	1.7	1.3	1.4	1.4	0.73	3.6	2.2	2.2	1.9	0.51
14-September-2023	28-September-2023	0.67	0.69	0.63	2.2	1.8	1.2	1.3	2.2	0.76	1.1	0.93	0.64	0.67	0.62
28-September-2023	12-October-2023	1.6	0.76	1.2	1.4	1.3	1.1	1.1	1.1	0.58	2.8	2.8	2.1	2.2	0.70
12-October-2023	26-October-2023	1.1	0.97	1.5	1.2	0.75	1.6	0.81	0.86	0.47	2.7	1.2	1.7	0.98	0.44
26-October-2023	9-November-2023	3.6	1.6	1.4	1.6	0.96	2.7	1.3	1.2	0.66	3.8	2.3	3.2	0.60	0.76
9-November-2023	23-November-2023	4.2	1.9	2.3	1.2	0.69	0.73	1.0	1.3	0.56	2.8	2.0	1.6	0.64	0.57
23-November-2023	7-December-2023	7.2	1.7	0.96	1.3	0.61	0.70	0.98	1.2	0.49	2.4	2.8	2.3	0.65	0.62
7-December-2023	21-December-2023	6.4	1.4	1.7	0.88	1.8	0.75	1.3	1.3	0.77	2.5	2.4	3.3	1.6	0.57

ii. B) Table B-1 shows the results of the calculations required by Section 62 to identify whether a statistically significant increase in the concentration of benzene occurred. As identified in Table B-1 there was a statistically significant increase in 2023 at station 10-TANKS. Monitoring of stations 13-DOCK1 and 14-DOCK2 started on November 24, 2022 therefore no statistical analysis could be completed for these stations in 2023 as they have not yet been monitored for three full calendar years.

Table B-1 Results of Section 62 Calculations

			1-FLARE	2-SPHERE	3-WWTP	4-WWTP	5-WWTP	6-FIREHALL	7-RAIL	8-RAIL	9-TERMINAL	10-TANKS	11-TANKS	12-TANKS
2018-2020	61(2)3.	X	0.28	0.06	0.46	0.32	0.09	0.14	0.46	0.43	-0.44	0.52	0.63	0.64
	61(2)4.	S^2	0.22	0.13	0.24	0.20	0.14	0.10	0.12	0.08	0.12	0.20	0.09	0.14
2023	62(3)3.	X	0.41	0.01	0.24	0.35	0.07	0.03	0.14	0.32	-0.49	0.91	0.64	0.79
	62(3)4.	S^2	0.42	0.10	0.14	0.16	0.13	0.10	0.06	0.08	0.05	0.17	0.14	0.19
	62(3)5.	T	0.93	-0.68	-2.36	0.36	-0.28	-1.45	-5.30	-1.85	-0.86	4.06	0.09	1.57
	62(3)6.	V	34.04	48.94	55.24	47.75	44.28	43.07	63.04	43.63	68.40	46.41	35.47	37.74
	62(3)7.	T	3.55	3.46	3.46	3.46	3.46	3.46	3.37	3.46	3.37	3.46	3.55	3.55
	62(3)8.	Statistically Significant Increase?	No	No	No	No	No	No	No	No	No	No	Yes	No

ii. C) Table C-1 provides a summary of the annual average benzene concentration results from the time that the monitor was first required by subsection 60(1).

Table C-1 Annual Average Benzene Concentration Results at each Station

Year/Results (ug/m³)	1-FLARE	2-SPHERE	3-WWTP	4-WWTP	5-WWTP	6-FIREHALL	7-RAIL	8-RAIL	9-TERMINAL	10-TANKS	11-TANKS	12-TANKS	13- DOCK1 (Note 1)	14- DOCK2 (Note 1)
2018	1.4	1.1	2.0	1.9	1.3	1.3	2.0	1.7	0.8	1.6	2.0	2.0	-	-
2019	1.5	1.2	1.8	1.3	1.3	1.2	1.8	1.7	0.7	1.9	2.0	2.1	-	-
2020	1.5	1.1	1.6	1.4	1.0	1.1	1.3	1.5	0.6	2.1	1.9	1.9	-	-
2021	1.1	0.8	1.2	1.3	0.9	1.0	1.2	2.1	0.6	3.5	1.9	1.5	-	-
2022	1.2	1.0	1.7	1.9	1.4	1.2	1.4	2.4	0.6	3.4	2.0	2.0	1.5	1.0
2023	1.9	1.1	1.4	1.5	1.1	1.1	1.2	1.4	0.6	2.7	2.0	2.4	1.2	0.7

Note 1: Annual averages for the two dock stations are only available starting from 2022 as they only began to be sampled on November 24, 2022 as per the amended PRIS Fence Line Benzene Monitoring Plan dated November 15, 2022.

iii. As per table B-1, there was a statistically significant increase in the concentration of benzene at station 10-TANKS. A notification regarding the statistically significant increase was made to the local provincial officer on March 28th, 2024, as required by subsection 63 (1). A written report will be provided to the local provincial officer within six months of the notification, as required under subsection 63 (2).