



2022 Annual Ambient Monitoring Report for Petroleum Refining – Industry Standard

Technical Standards to Manage Air Pollution: Petroleum Refining - Industry Standard, O. Reg. 419/05

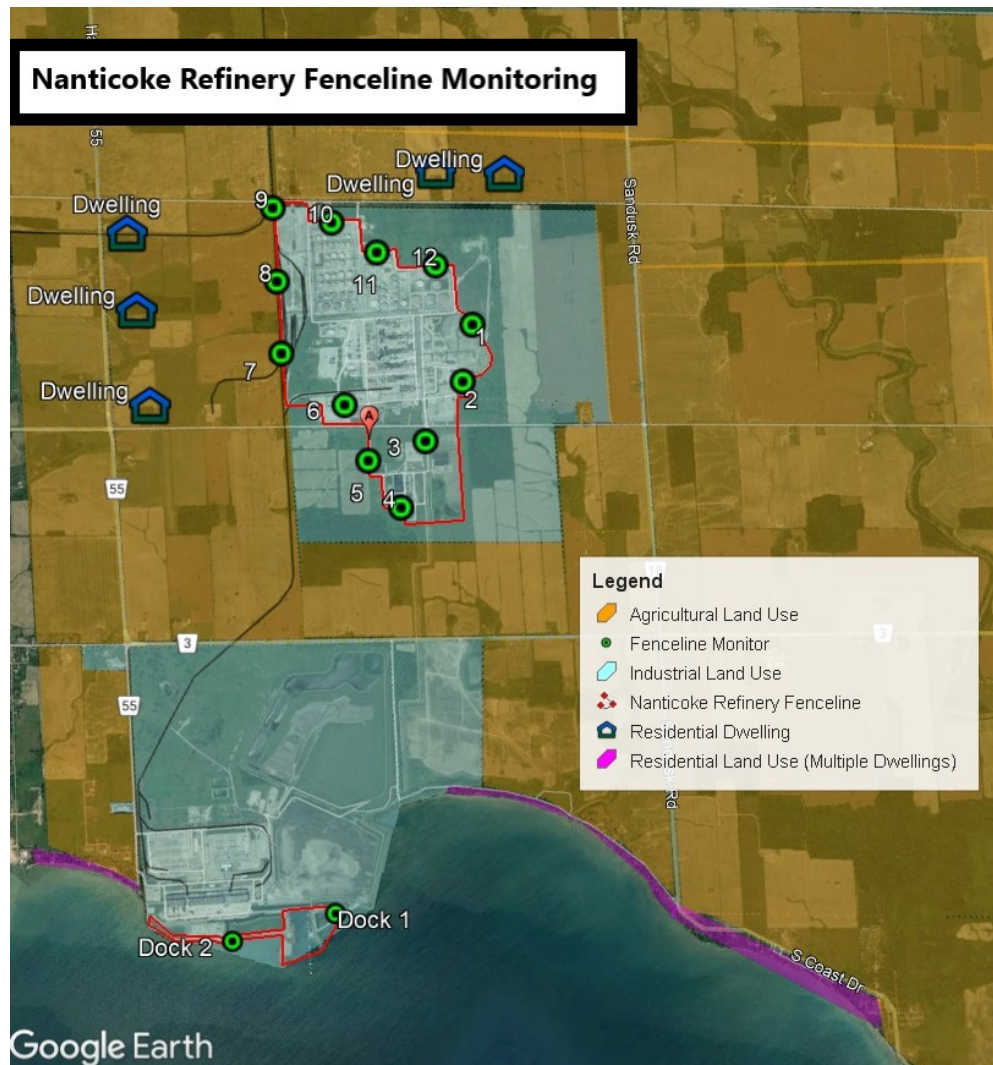
Part X – Complaints, Records and Reporting Section 65(2)

Nanticoke Refinery, Imperial

March 31, 2023

This report was developed in accordance the requirements of Part X, paragraph 6 of subsection 65(2) of the Technical Standards to Manage Air Pollution: Petroleum Refining - Industry Standard, O. Reg. 419/05.

- 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 2022 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 (Note 1)	14-DOCK2 (Note 1)
Location (Lat, Long)															
Date of Deployment/ Date of Retrieval/ Results (ug/m ³)															
23-December-2021	7-January-2022 (Note 2)	1.5	0.84	0.83	1.9	1.1	1.2	1.7	4.1	0.70	3.3	2.6	2.2		
7-January-2022	20-January-2022 (Note 3)	1.8	1.3	1.1	2	1.2	1.6	1.9	5.1	0.95	4.4	2.3	2.6	-	-
20-January-2022	2-February-2022	2.2	1.3	1.4	3.4	2.2	2.6	3.7	14	0.94	6.0	2.8	3.3	-	-
2-February-2022	17-February-2022	1.5	1.1	1.8	1.9	1.8	1.3	1.4	1.8	0.71	6.1	2.0	2.8	-	-
17-February-2022	3-March-2022	1.7	1.0	1	2.1	0.98	1.1	1.2	1.9	0.84	2.5	2.0	3.4	-	-
3-March-2022	17-March-2022	1.4	0.96	1.1	1.1	1.1	1.0	1.3	2.3	0.81	3.7	1.7	2.4	-	-
17-March-2022	31-March-2022	1.3	0.95	1.1	0.84	0.94	0.81	1.0	1.8	0.52	1.8	1.5	1.9	-	-
31-March-2022	14-April-2022	1.1	0.73	0.96	1.1	1.4	0.68	0.8	2.0	0.63	3.2	1.7	1.9	-	-
14-April-2022	28-April-2022	1.2	0.84	1.0	0.93	1.0	0.87	0.84	1.5	0.70	2.2	1.5	1.7	-	-
28-April-2022	12-May-2022	0.49	0.44	0.56	1.0	1.2	0.88	2.6	3.7	0.66	1.6	0.96	0.78	-	-
12-May-2022	26-May-2022	0.97	0.82	1.9	2.2	2.6	1.3	1.3	2.0	0.63	3.7	2.0	1.3	-	-
26-May-2022	9-June-2022	1.2	1.4	3.8	1.6	1.9	1.3	0.77	0.66	0.69	5.4	2.4	2.8	-	-
9-June-2022	23-June-2022	1.1	1.1	2.7	1.7	0.99	0.87	0.74	1.1	0.43	4.0	2.3	1.6	-	-
23-June-2022	7-July-2022	1.1	0.9	1.6	1.5	0.82	0.95	0.97	1.0	0.56	3.4	2.0	1.9	-	-
7-July-2022	21-July-2022	1.2	0.68	1.5	1.7	1.2	0.89	0.91	1.3	0.44	1.9	2.2	1.5	-	-
21-July-2022	4-Aug-2022	1.4	1.2	2.9	0.78	0.78	0.66	0.76	0.88	0.36	5.8	3.1	2.2	-	-
4-Aug-2022	18-Aug-2022	0.68	0.75	2.1	5.4	0.89	1.0	1.6	2.7	0.46	3.9	2.1	1.4	-	-
18-Aug-2022	1-September-2022	0.6	0.91	2.0	2.3	2.1	1.6	1.5	1.9	0.49	3.6	2.4	1.7	-	-
1-September-2022	15-September-2022	1.6	2.0	6.2	3.4	2.5	1.6	1.8	2.6	0.42	3.4	1.9	1.3	-	-
15-September-2022	29-September-2022	1.2	0.99	2.0	3.1	1.1	1.2	0.96	1.0	0.41	2.4	2.3	1.5	-	-
29-September-2022	13-October-2022	0.90	0.78	1.3	2	1.3	1.8	2.1	1.7	0.37	2.3	1.5	1.4	-	-
13-October-2022	27-October-2022	1.1	0.74	1.3	1.1	1.5	1.0	0.99	1.4	0.89	3.1	1.9	2.0	-	-
27-October-2022	10-November-2022	0.85	0.89	1.9	1.6	2.5	2.1	1.6	2.0	0.74	4.0	1.6	1.5	-	-
10-November-2022	24-November-2022	1.5	0.92	1.0	1.5	1.3	1.1	1.6	1.3	0.58	1.6	1.9	1.8	-	-
24-November-2022	8-December-2022	1.5	0.98	1.4	1.1	1.0	0.83	0.99	1.4	0.67	3.9	2.1	4.5	1.3	0.86
8-December-2022	22-December-2022	1.2	0.59	0.54	1.4	0.85	0.97	2.0	2.2	0.57	0.83	1.5	1.4	2.3	1.2

Note 1: Dock station sample results added to the report effective November 24, 2022 as per the amended PRIS Fence Line Benzene Monitoring Plan dated November 15, 2022.

Note 2: Samples were harvested on Day 15 instead of Day 14 due to late arrival of sample tubes

Note 3: Samples were harvested on Day 13 instead of Day 14 due to inclement weather.

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 2022 at monitor 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 2022.

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
2022	62(3)3.	X	0.17	-0.08	0.39	0.51	0.26	0.12	0.27	0.65	-0.51	1.13	0.67	0.64
	62(3)4.	S^2	0.11	0.09	0.30	0.22	0.14	0.11	0.17	0.39	0.08	0.22	0.06	0.14
	62(3)5.	T	-1.40	-1.89	-0.58	1.85	2.03	-0.15	-2.20	1.69	-1.06	5.72	0.70	0.05
	62(3)6.	V	58.62	51.25	39.04	41.10	43.35	40.60	37.43	28.45	50.89	41.30	51.19	42.72
	62(3)7.	T	3.46	3.46	3.55	3.46	3.46	3.46	3.55	3.66	3.46	3.46	3.46	3.46
	62(3)8.	Statistically Significant Increase?	No	No	No	No	No	No	No	No	No	No	Yes	No

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 Monitor

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

Note 1: Annual averages for the two dock stations are only available for 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 monitor 10-Tanks. A notification regarding the statistically significant increase was made to the local provincial officer on March 30th, 2023, 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).