



2018 Reporting Year Annual Ambient Monitoring Report for Petroleum Refining – Industry Standard

**Shell Canada Limited
Corunna Facility**

Prepared by:

**Shell Canada Limited
150 St. Clair Parkway
Corunna, Ontario
N0N 1G0**

March 31, 2019



LEGEND

- Ambient Air Monitor
- ☒ Sensitive Receptor

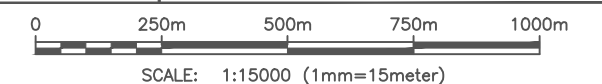
Last Revised March 2018: added land use designations; receptor locations; and updated drawing title names.



LEHDER ENVIRONMENTAL SERVICES
 704 MARA STREET, SUITE 210
 POINT EDWARD, ON N7V 1X4
 T 519-336-4101 F 519-336-4311
 www.lehder.com

LEHDER PROJECT NUMBER:
165178
 DATE:
January 2017
 LEHDER DRAWING NUMBER:
B-164255B-2

**Sarnia Manufacturing Centre
 Shell Canada Products
 Location of Property Line
 Monitoring Stations**





2018 Property Line Benzene Monitoring Results

Sample Deployment Date		10-Jan-18	24-Jan-18	7-Feb-18	21-Feb-18	7-Mar-18	21-Mar-18	4-Apr-18	18-Apr-18	2-May-18	16-May-18	30-May-18	13-Jun-18	27-Jun-18
Sample Retrieval Date		24-Jan-18	7-Feb-18	21-Feb-18	7-Mar-18	21-Mar-18	4-Apr-18	18-Apr-18	2-May-18	16-May-18	30-May-18	13-Jun-18	27-Jun-18	11-Jul-18
UTM Coordinates	Location	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
382166mE, 4752034mN	Station #1	7.68	8.25	7.96	4.53	4.78	1.40	3.85	1.94	2.52	5.59	2.39	3.62	4.72
382511mE, 4752034mN	Station #2	5.65	3.97	5.00	2.65	2.50	1.03	2.94	1.50	2.00	3.44	1.77	2.51	2.24
383172mE, 4752033mN	Station #3	3.04	1.71	3.00	2.11	1.51	1.12	1.75	1.36	2.02	2.30	1.98	1.80	1.26
383332mE, 4751409mN	Station #4	2.19	1.60	2.05	1.39	1.47	1.11	1.36	1.23	1.75	1.71	1.90	2.13	0.96
382517mE, 4751245mN	Station #5	3.00	2.82	2.97	1.79	2.79	1.68	2.80	2.27	1.70	1.92	1.70	1.97	1.39
382125mE, 4750795mN	Station #6	2.17	2.55	2.58	2.37	3.38	2.56	2.18	2.14	1.83	2.23	2.05	2.65	1.76
381748mE, 4750810mN	Station #7	3.17	2.96	2.89	2.93	3.87	2.61	2.97	2.82	2.39	2.55	2.95	3.17	2.21
381455mE, 4750820mN	Station #8	5.54	7.28	9.60	20.80	13.50	14.30	16.10	9.64	7.94	6.60	11.20	15.10	8.83
381052mE, 4750852mN	Station #9	1.14	2.22	2.85	6.47	2.81	2.32	2.65	2.25	2.51	2.05	3.13	2.67	1.57
381112mE, 4751494mN	Station #10	4.13	4.28	5.66	3.73	4.34	2.67	2.72	5.00	1.51	1.77	4.91	2.61	3.56
381438mE, 4751966mN	Station #11	21.20	11.10	11.90	4.96	2.81	5.55	9.35	8.31	3.62	6.45	9.11	6.78	6.43
381773mE, 4752076mN	Station #12	53.70	24.80	34.90	14.20	3.08	5.37	9.14	9.53	14.40	11.90	5.49	10.60	20.60

Field QA/QC Data

Field Blank #1	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1
	Value (ug/m3)	<0.31	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.30	See Note 2	<0.30	<0.30
Field Duplicate	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1
	Value (ug/m3)	7.67	3.76	3.02	1.39	2.72	2.42	2.94	9.43	2.52	1.74	See Note 2	10.40	4.66
	RPD (%)	0.13%	5.29%	0.67%		2.51%	5.47%	1.01%	2.18%	0.40%	1.69%	See Note 2	1.89%	1.27%
Field Blank #2	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7
	Value (ug/m3)	<0.31	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30	<0.30	<0.30

Notes:

- 1) RPD is Relative Percent Difference (Difference / Mean expressed as a percent). Used as the default precision evaluation.
- 2) Sample Period May 30-June 11; Station#11: No analytical value was reported for the Station #11 routine sample nor the blank sample at Station #11, due to laboratory error. The samples were compromised during an instrument error, with no option to rerun. The duplicate and routine values have been interchanged for reporting purposes. The laboratory has also indicated the reported values at Station #10, Station#11 and Station#12 may be biased low.
- 3) Sample Period July 11-25: Station #8 was impacted by a >50% off-site wind profile for this period.
- 4) Sample Period Sept. 5 - 19: ALS was unable to report results for Stations 2 and 3 due to a power failure at the laboratory while analyzing the samples.
- 5) Sample Period Nov. 14-28: Sample tube at STN-7 was missing from shroud at end of sampling period (November 28).

Ontario Ministry of the Environment, Conservation and Parks (MECP)
 Petroleum Industry Refining Standard (PRIS)
 Shell Canada Products Sarnia Manufacturing Centre
 Sarnia, Ontario Canada



2018 Property Line Benzene Monitoring Results

Sample Deployment Date		11-Jul-18	25-Jul-18	8-Aug-18	22-Aug-18	5-Sep-18	19-Sep-18	3-Oct-18	17-Oct-18	31-Oct-18	14-Nov-18	28-Nov-18	12-Dec-18
Sample Retrieval Date		25-Jul-18	8-Aug-18	22-Aug-18	5-Sep-18	19-Sep-18	3-Oct-18	17-Oct-18	31-Oct-18	14-Nov-18	28-Nov-18	12-Dec-18	27-Dec-18
UTM Coordinates	Location	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
382166mE, 4752034mN	Station #1	2.34	1.36	1.30	2.70	1.25	1.07	1.19	1.49	0.96	0.91	1.29	1.50
382511mE, 4752034mN	Station #2	1.73	1.03	1.09	1.76	See Note 4	0.99	1.01	1.32	0.94	0.86	1.12	1.74
383172mE, 4752033mN	Station #3	1.22	0.85	1.03	1.26	See Note 4	0.86	0.89	0.94	0.91	0.79	0.93	1.31
383332mE, 4751409mN	Station #4	1.21	0.91	1.17	1.00	1.12	0.86	0.91	1.19	0.93	0.79	0.99	1.44
382517mE, 4751245mN	Station #5	1.78	1.31	1.72	1.76	1.37	1.26	1.20	1.53	1.80	1.24	1.75	2.56
382125mE, 4750795mN	Station #6	1.51	1.13	1.40	1.25	1.92	1.62	1.44	1.94	1.81	1.89	2.38	2.87
381748mE, 4750810mN	Station #7	1.23	1.13	1.42	0.91	1.63	1.59	1.23	2.34	1.95	See Note 5	2.28	2.29
381455mE, 4750820mN	Station #8	10.00	3.77	9.47	3.74	31.00	7.98	2.55	6.81	7.84	5.49	2.89	6.18
381052mE, 4750852mN	Station #9	1.64	1.03	2.03	1.34	4.69	2.38	1.05	1.90	1.39	1.04	0.98	1.86
381112mE, 4751494mN	Station #10	2.43	1.21	1.51	1.77	1.21	1.56	1.23	0.91	1.29	1.47	1.26	2.07
381438mE, 4751966mN	Station #11	3.15	1.17	1.08	5.62	0.91	1.08	1.30	0.92	0.91	0.94	0.91	1.53
381773mE, 4752076mN	Station #12	3.54	1.50	1.13	7.19	1.05	1.22	1.55	1.27	1.00	0.90	1.00	1.50

Field QA/QC Data

Field Blank #1	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.29
Field Duplicate	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1
	Value (ug/m3)	1.74	0.91	0.98	1.61	1.67	1.48	2.76	1.98	1.23	0.90	1.04	1.56
	RPD (%)	0.58%	7.06%	16.24%	8.52%	13.02%	6.92%	8.24%	4.21%	4.65%	4.26%	4.00%	10.34%
Field Blank #2	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.33	<0.31	<0.31	<0.31	<0.31	<0.29

Section 65(2) 6. ii. B. Statistical analysis of benzene measurements

Monitoring Station	Analysis Year			Benzene Measurements Baseline			Test Statistic, T_Calc	Degrees of Freedom, v	Is the increase in the benzene concentration in analysis year statistically significant?
	Mean, Y	Square of Standard Deviation, S2^2	n, number of two-week average concentrations Subsection 62(3)	Mean, X Subsection 61(2)	Square of Standard Deviation, S1^2 Subsection 61(2)	m, number of two-week average concentrations Subsection 61(2)			
1	0.87	0.50	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
2	0.60	0.30	24	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
3	0.32	0.16	24	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
4	0.24	0.09	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
5	0.61	0.08	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
6	0.69	0.07	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
7	0.77	0.15	24	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
8	2.11	0.35	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
9	0.69	0.22	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
10	0.81	0.30	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
11	1.17	1.04	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
12	1.52	1.64	25	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1

Year	Annual Average Benzene Concentration (µg/m³)											
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12
2018	3.06	2.12	1.50	1.33	1.92	2.06	2.31	9.77	2.24	2.59	5.08	9.62
2019												
2020												
2021												
2022												
2023												
2024												
2025												
2026												

Note(s): 1. The values in the Statistical Analysis table will not be available until the report that is produced in 2022, where 2018-2020 are the base years and 2021 is the analysis year.



Memo

To: Whom it may concern

From: Environmental Department

Date: 11-Feb-2019

Re: Petroleum Refinery Technical Standard S.65(2) 6. iii. Annual Summary of Notification – ambient monitoring

Subparagraph 6. iii. of subsection 65(2) of the Tech Standard requires the preparation of an annual summary of the information required by section 63.

Section 63 of the Petroleum Refinery Technical Standard [the “Tech Standard”] requires the following:

63. (1) A registered person shall ensure that, as soon as practicable, a provincial officer is notified in writing if it is determined under section 62 that there has been a statistically significant increase in the concentration of benzene at an ambient monitor required by subsection 60 (1).

(2) No later than six months after notice is required to be given under subsection (1), the registered person shall ensure that the following information is submitted, in writing, to a provincial officer:

1. The measured and calculated values relating to the statistically significant increase in the concentration of benzene.
2. An explanation of the suspected cause of the statistically significant increase in the concentration of benzene.
3. A description of any steps taken or that will be taken to prevent, minimize, or reduce the risk of future statistically significant increases in the concentration of benzene, if any.

4. An indication of the date by which each step mentioned in paragraph 3 will be implemented.
5. A written explanation of how each step mentioned in paragraph 3 will prevent, minimize or reduce the risk of any future statistically significant increases in the concentration of benzene.

Subsection 63(3) of the Tech Standard requires that a statistical analysis shall be completed following the fourth full calendar year for which a determination of whether a statistically significant increase in the concentration of benzene has occurred. Until this statistical analysis is completed following the collection of four (4) full years of data a determination of whether a statistically significant increase has occurred will be unable to be established.