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**2019 Reporting Years Annual Ambient  
Monitoring Report for Petroleum Refining –  
Industry Standard**

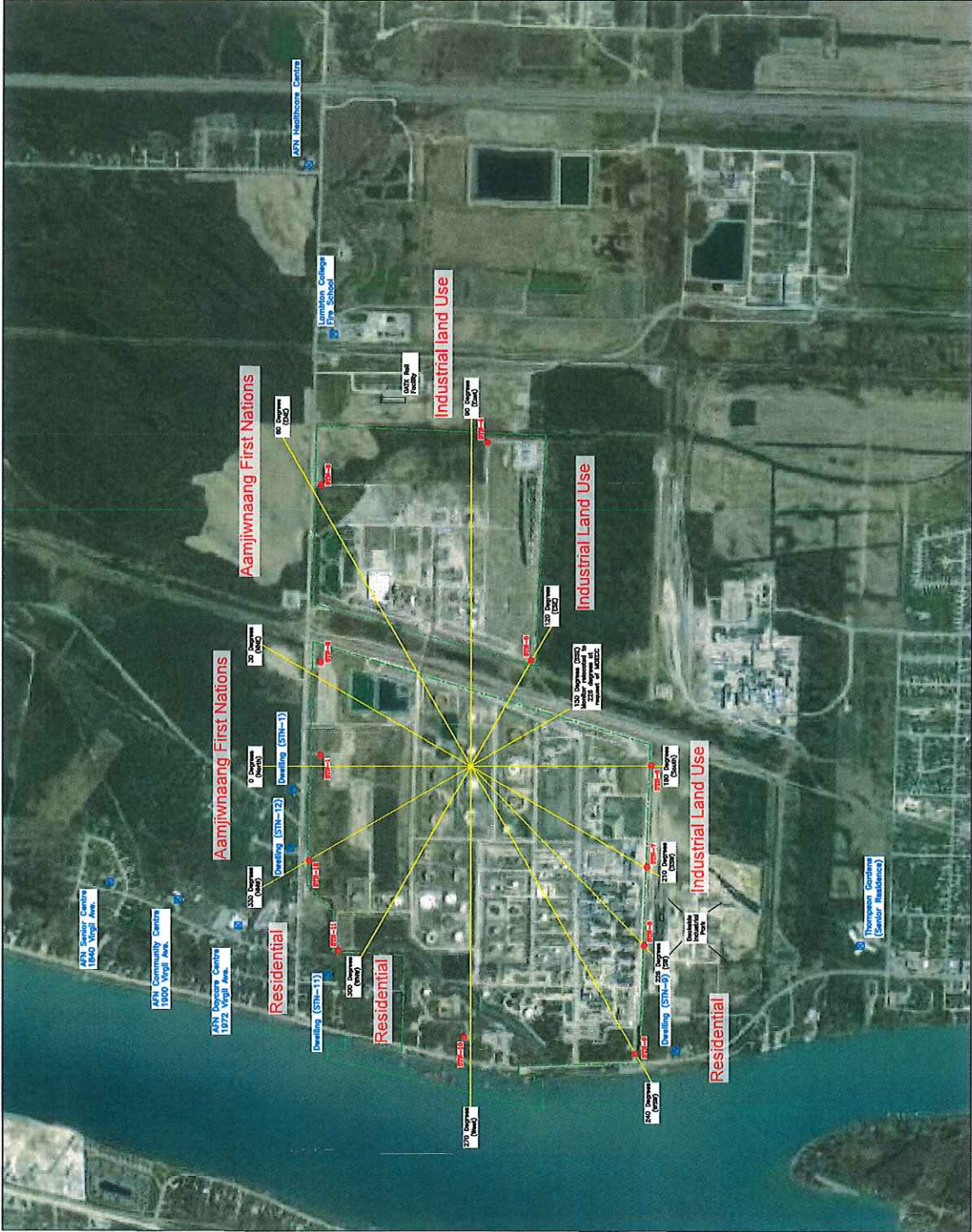
**Shell Canada Limited  
Corunna Facility**

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Prepared by:

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**March 31, 2020**



**LEGEND**

- Ambient Air Monitor
- Sensitive Receptor

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

<p><b>LEHDER</b> Environmental &amp; Regulatory Air Quality Services</p>	
LEHDER PROJECT NUMBER:	165178
DATE:	January 2017
LEHDER DRAWING NUMBER:	B-164255B-2
<p>Sarnia Manufacturing Centre Shell Canada Products Location of Property Line Monitoring Stations</p>	
<p>SCALE: 1:15000 (1mm=15metre)</p>	



2019 Property Line Benzene Monitoring Results

Sample Deployment Date	27-Dec-18	9-Jan-19	23-Jan-19	6-Feb-19	20-Feb-19	6-Mar-19	20-Mar-19	3-Apr-19	17-Apr-19	1-May-19	15-May-19	29-May-19	12-Jun-19
Sample Retrieval Date	9-Jan-19	23-Jan-19	6-Feb-19	20-Feb-19	6-Mar-19	20-Mar-19	3-Apr-19	17-Apr-19	1-May-19	15-May-19	29-May-19	12-Jun-19	26-Jun-19
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 #13
382166mE, 4752034mN	2.14	1.07	2.90	1.28	1.24	1.34	1.61	1.27	1.03	1.01	1.44	1.52	1.38
382511mE, 4752034mN	1.44	1.19	3.04	1.16	1.20	1.27	1.02	1.24	0.78	0.87	1.50	1.29	1.17
383172mE, 4752033mN	1.01	0.74	1.57	1.48	0.99	0.91	1.15	1.17	0.92	1.17	1.62	1.42	1.45
383332mE, 4751409mN	1.12	0.85	1.25	1.26	1.25	1.19	1.20	1.11	0.99	1.12	1.63	1.36	1.60
382517mE, 4751245mN	1.77	1.39	2.32	1.94	2.19	1.91	1.26	1.46	1.07	0.96	1.44	1.36	1.18
382125mE, 4750795mN	1.95	2.37	2.37	1.60	2.89	1.99	2.14	1.74	1.26	1.03	1.61	1.25	1.12
381748mE, 4750810mN	2.25	2.69	1.86	1.63	2.45	1.55	2.04	2.05	1.56	1.60	1.45	1.46	1.32
381455mE, 4750820mN	7.20	10.50	2.99	8.49	4.82	0.89	9.79	11.10	14.60	8.33	3.49	3.82	25.00
381052mE, 4750852mN	1.00	3.41	1.59	3.20	1.79	0.61	1.69	2.38	1.01	1.39	1.75	1.16	1.15
381112mE, 4751494mN	2.32	1.29	1.20	2.52	1.35	1.49	1.43	3.06	1.45	2.56	2.30	1.98	0.96
381438mE, 4751966mN	1.35	1.19	1.70	1.07	0.92	1.35	1.37	1.23	2.67	1.15	2.20	1.52	1.03
381773mE, 4752076mN	1.63	0.98	2.41	0.93	0.98	1.50	2.00	1.23	1.96	1.68	2.07	2.38	1.81

Field QA/QC Data

Field Blank #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	Station #2
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	Station #2
Value (ug/m3)	<0.34	<0.32	<0.32	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30
Field Duplicate	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #1	Station #2
Value (ug/m3)	1.33	0.76	1.35	1.88	2.62	1.57	10.10	2.41	1.40	1.10	1.99	1.37	1.14
RPD (%)	7.64%	2.70%	8.00%	3.09%	9.34%	1.29%	3.17%	1.26%	3.45%	4.35%	3.86%	9.87%	2.56%
Field Blank #2	Location	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8
Value (ug/m3)	<0.34	<0.32	<0.32	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30

Notes:

- RPD is Relative Percent Difference (Difference / Mean expressed as a percent). Used as the default precision evaluation.
- Sample Period Feb 6 to Feb 20: Results for sample at Station #1 may be biased slightly low, based on one of the QC checks being slightly out of tolerance. All other QC passed.

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



Sample Deployment Date	26-Jun-19	10-Jul-19	24-Jul-19	7-Aug-19	21-Aug-19	4-Sep-19	18-Sep-19	2-Oct-19	16-Oct-19	30-Oct-19	13-Nov-19	27-Nov-19	11-Dec-19
Sample Retrieval Date	10-Jul-19	24-Jul-19	7-Aug-19	21-Aug-19	4-Sep-19	18-Sep-19	2-Oct-19	16-Oct-19	30-Oct-19	13-Nov-19	27-Nov-19	11-Dec-19	24-Dec-19
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	1.88	1.94	2.33	1.58	1.29	1.32	1.54	1.22	1.71	2.04	2.82	1.27	1.59
382511mE, 4752034mN	1.71	1.29	1.41	1.06	1.05	0.97	0.99	0.88	1.07	1.47	1.96	1.12	1.27
383172mE, 4752033mN	1.66	1.06	1.13	0.93	0.94	0.83	1.06	0.82	0.84	0.98	1.19	0.74	1.04
383332mE, 4751409mN	1.76	1.01	1.19	0.91	0.85	0.65	0.96	0.69	0.76	0.91	1.02	0.81	1.04
382517mE, 4751245mN	1.92	1.54	2.08	1.62	1.25	0.99	1.69	1.35	1.28	1.77	1.64	1.55	1.50
382125mE, 4750795mN	2.23	1.65	1.28	1.25	1.24	1.20	1.01	0.96	1.23	1.23	1.11	1.20	1.68
381748mE, 4750810mN	2.21	1.50	1.34	1.12	1.12	1.36	0.61	0.95	1.43	1.48	1.00	1.42	1.49
381455mE, 4750820mN	17.70	13.20	13.90	6.07	10.70	6.46	3.59	4.38	4.04	6.75	1.61	4.04	2.65
381052mE, 4750852mN	1.54	0.82	1.23	1.32	1.41	1.68	0.63	1.03	1.10	1.14	1.15	0.84	1.56
381112mE, 4751494mN	1.54	1.02	0.92	1.34	2.22	2.69	1.32	2.38	2.61	0.97	2.10	0.93	2.88
381438mE, 4751966mN	1.93	1.44	1.94	2.19	1.70	2.43	2.29	2.21	3.94	1.64	4.18	1.90	4.15
381773mE, 4755076mN	2.25	3.33	3.22	2.92	1.90	1.82	3.34	1.76	2.77	4.42	4.39	3.00	6.93

Field QA/QC Data

Field Blank #1	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3
Location	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3
Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31	<0.34
Field Duplicate	Location	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #1	Station #2	Station #3
Value (ug/m3)	1.72	0.96	1.98	1.23	1.17	6.65	0.62	2.25	3.95	4.24	2.80	1.12	1.11
RPD (%)	3.61%	4.95%	4.81%	1.60%	4.46%	2.94%	1.59%	5.46%	0.25%	4.07%	0.71%	0.00%	6.75%
Field Blank #2	Location	Station #9	Station #10	Station #11	Station #12	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9
Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31	<0.34

**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, $\nu$	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	0.43	0.08	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
2	0.21	0.08	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
3	0.08	0.06	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
4	0.06	0.06	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
5	0.42	0.05	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
6	0.40	0.09	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
7	0.41	0.10	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
8	1.82	0.58	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
9	0.28	0.17	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
10	0.52	0.15	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
11	0.58	0.17	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
12	0.78	0.24	26	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1

Year	Annual Average Benzene Concentration ( $\mu\text{g}/\text{m}^3$ )											
	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	1.61	1.29	1.11	1.10	1.56	1.56	1.57	7.93	1.45	1.80	1.95	2.45
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:** 4-Feb-2020

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

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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.