INEOS STYROLUTION

Petrochemical Industry Standard for Benzene

INEOS Styrolution Canada Ltd.
Sarnia Facility

Annual Summary Report

Section 65 (4) / 65 (2):

1. Implementation Summary Table
8. Performance Summary Table

Section 66 (1):

3. Ambient Air Monitoring Report for PCIS

INEOS STYROLUTION

Petrochemical Industry Standard for Benzene

2024 Implementation Summary Table

INEOS Styrolution Canada Ltd.
Sarnia Facility

INEOS STYROLUTION

Implementation Summary Table

Section	Provision	Compliance Deadline	Compliance Date
Part I - General			
1	Definition	no deadline	-----
2	Application	no deadline	Registered Jul. 28, 2017
Part II - Performance			
3	Leak Measurement Instrumentation	Upon registration	Jul. 28, 2017
4	Closed systems	Upon registration	Jul. 28, 2017
5	Flare	Jan. 1, 2020	Jan. 1, 2020
6	Air pollution control devices	Upon registration	Jul. 28, 2017
7	Requirement to detect leaks	see section 39 (1)	Jan. 1, 2018
8	Notification - performance requirements	upon registration, but in accordance with compliance dates of section 4 and 7	no notifications required due to contraventions
Part III - Storage Vessels			
9	Storage vessels - identification	Upon registration	Jul. 28, 2017
10	Storage vessels - application	Jan. 1, 2018	Jan. 1, 2018
11	Floating roof - requirement to float	Upon registration	Jul. 28, 2017
12	Internal floating roof - rim seal requirements	Upon registration	Jul. 28, 2017
13	External floating roof - rim seal requirements	Not applicable	---
14	Floating roof deck fittings	Upon registration	Jul. 28, 2017
15	Deck covers - requirement to be closed	as per section 10	Jul. 28, 2017
16	Floating roof - visual inspection	by Jan. 30, 2023	Jan. 26, 2023
17	Storage vessels - OGI inspection	first inspection by April 31, 2018	Mar. 20, 2018
18	Floating roof - seal gap inspection	Upon registration	---
19	Storage vessel repair	Upon registration	---
20	Requirement to notify - recurring repairs	Upon registration	---
21	Storage vessels in benzene service - general record	Upon registration	Jul. 28, 2017
22	Storage vessels inspection record	Upon registration	---
23	Rim seal gap report - storage vessels	Not applicable	---
Part IV - Air Emissions from Industrial Sewage			
23.1	Application, sections 24 and 25	Not applicable	---
24	Primary oil-water separators - requirement selection	Not applicable	---
25	Primary oil-water separators - monitoring and control requirements	Not applicable	---
26	Primary oil-water separators floating roof - requirement to float	Not applicable	---

Section	Provision	Compliance Deadline	Compliance Date
27	Primary oil-water separators floating roof - rim seal gap inspection	Not applicable	---
28	Primary oil-water separator - OGI inspection	Not applicable	---
29	Primary oil-water separator repair	Not applicable	---
30	Primary oil-water separators record - general	Not applicable	---
31	Primary oil-water separators record	Not applicable	---
32	Rim seal gap report - primary oil-water separator	Not applicable	---
33	Drains and maintenance access points - measurement and control requirements	Jul. 1, 2019	Minimization Plan approved Jun. 28, 2019 Monitoring Plan approved Nov. 22, 2019
34	Drains and maintenance access point record	Upon registration	Jul. 28, 2017
Part V - Product Loading			
35	Benzene-containing product loading operations - application	Not applicable	---
36	Cargo tank loading operations - general operating requirements	Not applicable	---
37	Vapour-tight cargo tanks	Not applicable	---
Part VI - Leak Detection and Repair			
38	Component Identification	Jan. 1, 2018	Dec. 31, 2017
39	Component leak Survey - general	first monitoring complete by June 30, 2019 39 (6) by Mar. 1, 2018	Jun. 30, 2018 Mar. 6, 2018
40	Component leak survey - assessment and measurement of leaks	Jan. 1, 2018 40 (5) Jan. 1, 2023 40 (6) Jan. 1, 2018 40 (7) (8) Jan. 1, 2018 40 (9) Jan. 1, 2023	Jan. 1, 2018 Jan. 1, 2023 Jan. 1, 2018 Jan. 1, 2018 Jan. 1, 2023
41	Component leak survey plan	Mar. 1, 2018	Jun. 6, 2018
42	Additional leak measurements - pumps, compressors and pressure relief devices	Jan. 1, 2023	Jan. 1, 2023
43	Leaks - deviations and repair	Jan. 1, 2018 43 (1) 43 (2) (3) (4) (5) Jan 1, 2020	Jan. 1, 2018 Jan. 1, 2020
44	Delay of repair list	Jan. 1, 2020	Jan. 1, 2020
45	Re-measurement following component repair or replacement	Jan. 1, 2018	Jan. 1, 2018
46	Component replacement	Jan. 1, 2020	Jan. 1, 2020

INEOS STYROLUTION

Section	Provision	Compliance Deadline	Compliance Date
47	Leaking components - annual calculations	no deadline	Mar. 31, 2018
48	Records - component leak survey	first survey Jun. 30, 2018	Mar. 6, 2018
49	Records - additional leak measurements	Jan. 1, 2018	Jan. 1, 2018
Part VII - Operation			
50	Technology requirements - open-ended valves	Upon registration Jul. 28, 2017	additional projects in progress
51	Technology requirements - surge control vessels and bottoms receivers	Jan. 1, 2020	---
52	Operating parameter summary table	Jan. 1, 2018	Jan. 1, 2018
53	Measurement of operating parameters	Jan. 1, 2018	Jan. 1, 2018
54	Phase-in for new air pollution control devices	Not applicable	---
Part VIII - Requirement to Continue the Use of Methods to Manage Emissions			
55	Identifying managed sources	Jan. 1, 2018	Jan. 1, 2018
56	Requirement to continue the management of sources	Jan. 1, 2018	Jan. 1, 2018
57	Changes to managed sources	no changes made	---
58	Specified source management	no changes made	---
59	Notification of changes to management of sources	no notification required	---
Part IX - Ambient Monitoring			
60	Ambient Monitoring	on or after Jan. 1, 2018	Jan. 9, 2018
61	Measurements baseline	Mar. 31, 2021	Mar. 31, 2021
62	Statistical analysis of ambient measurements	Mar. 31, 2022	Mar. 31, 2022
63	Notification - ambient monitoring	Mar. 31, 2022	Mar. 31, 2022
Part X - Complaints, Records and Reporting			
64	Complaints procedure	Upon registration Jul. 28, 2017	Jul. 28, 2017
65	Annual summary reports	Mar. 31, 2019	Mar. 31, 2019
66	Public reporting - ambient monitoring	66 (1) 3. Mar 31, 2019 66 (1) 2. Jan. 1. 2018 66 (2) Mar. 24, 2018	Mar. 31, 2019 Jan. 29, 2018 Mar. 16, 2018
67	Records	Upon registration Jul. 28, 2017	Jul. 28, 2017

Petrochemical Industry Standard for Benzene

2024 Performance Summary Table

INEOS Styrolution Canada Ltd.
Sarnia Facility

INEOS STYROLUTION

Performance Summary Table

Section 8 (1) Notifications	**Subsections 11 (1) and 26 (1) Contraventions**	**Ministry Orders under Subsection 52 (5) or Section 58**
No notifications were required.	No contraventions under Subsections 11 (1) and 26 (1).	No Subsection 52 (5) or Section 58 Ministry Orders were received.

Petrochemical Industry Standard for Benzene

2024 Ambient Annual Monitoring Report

INEOS Styrolution Canada Ltd.
Sarnia Facility

2024RY PCIS ANNUAL AMBIENT AIR MONITORING REPORT

SARNIA FACILITY

Prepared for: **INEOS STYROLUTION CANADA LTD.**

Prepared by: **MONTROSE ENVIRONMENTAL SOLUTIONS CANADA INC.**

Version 0.1
March 2025
Point Edward, Ontario

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2024RY PCIS ANNUAL AMBIENT AIR MONITORING REPORT

SARNIA FACILITY

Prepared for INEOS Styrolution Canada Ltd., March 2025

Evan Metcalfe
Environmental Specialist

reviewed by
Kelly Carson
Air P&C Team Manager

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APPENDICES

1 INTRODUCTION

Montrose Environmental Solutions Canada Inc. (Montrose; formerly LEHDER Environmental) was retained by INEOS Styrolution Canada Ltd. (INEOS Styrolution) to prepare the 2024RY Annual Ambient Monitoring Report for its facility located in Sarnia, Ontario.

The INEOS Styrolution Sarnia facility is comprised of two separate locations known as Styrene I and Styrene II. Styrene I is approximately 7.1 hectares; Styrene II is 24.5 hectares in size. Styrene I is located 550 m west of Styrene II.

Styrene I, also known as the West Tank Farm, is located on Vidal Street in Sarnia. It is bounded by Arlanxeo (formerly Lanxess) to the north, Vidal Street to the east, Aamjiwnaang First Nation Territory to the southeast and the former DOW manufacturing facility to the south and west.

Styrene II is located at 872 Tashmoo Avenue in Sarnia. It is bounded by Cabot Canada to the north, undeveloped lands to the northeast, Arlanxeo to the east, Churchill Road and Aamjiwnaang First Nation Territory to the south and Tashmoo Avenue to the west. Appendix B contains a detailed image of the property boundary.

This report is being submitted to meet the Ontario Ministry of Environment, Conservation and Parks (MECP) annual reporting requirements for ambient air monitoring of benzene required under *Part X of the Petrochemical - Industry Standard (PCIS), Technical Standards to Manage Air Pollution, Version 3.0* (MECP 2020).

2 PCIS REPORTING REQUIREMENTS – SECTION 65(2)6

6. A report entitled "Annual Ambient Monitoring Report for Petrochemical – Industry Standard" that sets out,
    i. a map showing the location of each monitor 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,
    ii. for each monitor required by subsection 60 (1),
        A. the information required by subsection 60 (6),
        B. the results of calculations required by section 62 to identify whether a statistically significant increase in the concentration of a registered contaminant occurred,
        C. a summary showing the annual average concentration results for each registered contaminant from the time that the monitor was first required by subsection 60 (1),
    iii. a summary of the information required by section 63.

Relevant PCIS *Ambient monitoring,* Section 60, excerpts as referenced in 65(2)6:

60. (1) On and after January 1, 2018, a registered person shall ensure that the concentration of each registered contaminant discharged from the petrochemical facility into the air is measured by,

(a) at least 12 ambient monitors, if the petrochemical facility is on a property that is 80 hectares or greater; or

(b) at least six ambient monitors, if the petrochemical facility is on a property that is less than 80 hectares.

(4) In forming the opinion required under clause (2) (c), the Director shall have regard to,

(a) the property boundary of the petrochemical facility;

(b) the wind rose or predominant wind direction at the petrochemical facility;

(c) the location and height of the sources of contaminant that discharge a registered contaminant to the air at the petrochemical facility, including,

(i) storage vessels,

(ii) product loading areas, and

(iii) sewage treatment;

(d) the presence of any of the following places near the petrochemical facility,

(i) a health care facility,

(ii) a senior citizens' residence or long-term care facility,

(iii) a child care facility,

(iv) an educational facility, and

(v) a dwelling;

(e) whether a local First Nation may be interested in the location of the monitors; and

(f) the location of the other monitors required by subsection (1).

(6) A registered person shall ensure that the following information is recorded for each monitor:

1. The location of the monitor.

2. Each measured concentration of each registered contaminant mentioned in subsection (5).

3. For each value mentioned in paragraph 2, the dates of the period of time during which the monitor sampled air.

Relevant PCIS *Statistical analysis of ambient measurements,* Section 62, excerpts as referenced in 65(2)6:

62. (1) For the purpose of this section, reference to a statistically significant increase in the concentration of a registered contaminant is a reference to the determination of whether the concentration of the registered contaminant measured at a monitor during a calendar year is higher than the concentration of the registered contaminant measured at the monitor during the three-year period in which the most recent baseline was determined under section 61 and, if so, whether the increase in concentration is statistically significant.

(2) A registered person shall ensure that a determination of whether a statistically significant increase in the concentration of a registered contaminant has occurred in a year is made in accordance with this section.

(3) No later than March 31 in each year following the fourth full calendar year in which this section applies in respect of a petrochemical facility, a statistical analysis shall be completed by performing the following steps with respect to each ambient monitor identified as adequate under section 60 and each registered contaminant measured by the monitor:

1. For each two-week period in the previous calendar year record one of the following,
    i. if the monitor indicates a measurement of a concentration of the registered contaminant, record the measured concentration of the registered contaminant,
    ii. if the monitor indicates that the measurement of the concentration of the registered contaminant was below the detection limit of the monitor, record half of the detection limit of the monitor as the concentration of the registered contaminant, and
    iii. if the monitor provides no indication of any measurements with respect to the concentration of the registered contaminant, do not record a concentration but instead record an explanation of why no measurement of the registered contaminant was taken.
2. Translate each two-week average recorded in paragraph 1 to its equivalent natural logarithm.
3. Calculate the mean of all of the values translated in paragraph 2.

4. Calculate the square of the standard deviation of all of the values translated in paragraph 2 using the following equation:

$$S^2 = [_1 \sum^{n} (x_i - X)^2] / (n-1)$$

Where,

S
is the standard deviation;

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

xi
is each value translated in paragraph 2;

X
is the value calculated in paragraph 3.

5. Calculate the test statistic using the following equation:

$$T = (Y - X) / \sqrt{(S_1^2/m + S_2^2/n)}$$

Where,

T
is the test statistic;

Y
is the value calculated in paragraph 3;

X
is the most recent value calculated in paragraph 3 of subsection 61 (2);

S1
is the most recent value calculated in paragraph 4 of subsection 61 (2);

S2
is the value calculated in paragraph 4;

m
is the most recent number of two-week average concentrations recorded in paragraph 1 of subsection 61 (2);

n
is the number of two-week average concentrations recorded in paragraph 1.

6. Calculate the degrees of freedom using the following equation:

$$(v) = [(S_1^2/m + S_2^2/n)^2]/[(S_1^2/m)^2/(m-1) + (S_2^2/n)^2/(n-1)]$$

Where,

(v)
is the degrees of freedom;

S1, S2, m and n
have the same meanings as set out in paragraph 5.

7. Find the value calculated in paragraph 6 in Column 1 of Table 7-62 and determine the value set out opposite that value in Column 2.
8. Determine whether there has been a statistically significant increase in the concentration of the registered contaminant at the monitor by assessing whether the value calculated in paragraph 5 exceeds the value determined under paragraph 7.

Table 7-62: Statistical Analysis

Item	Column 1 Degrees of Freedom (v)	Column 2 Test Statistic (T) with level of significance (%) = 0.0005
1.	1	636.6
2.	2	31.60
3.	3	12.92
4.	4	8.610
5.	5	6.869
6.	6	5.959
7.	7	5.408
8.	8	5.041
9.	9	4.781
10.	10	4.587
11.	11	4.437
12.	12	4.318
13.	13	4.221

Table 7-62: Statistical Analysis

Item	Column 1 Degrees of Freedom (v)	Column 2 Test Statistic (T) with level of significance (%) = 0.0005
14.	14	4.141
15.	15	4.073
16.	16	4.015
17.	17	3.965
18.	18	3.922
19.	19	3.883
20.	20	3.850
21.	21	3.819
22.	22	3.792
23.	23	3.768
24.	24	3.745
25.	25	3.725
26.	26	3.707
27.	27	3.690
28.	28	3.674
29.	29	3.659
30.	30	3.646
31.	40	3.551
32.	60	3.460
33.	120	3.373
34.	∞	3.291

Relevant PCIS *Measurements baseline,* Section 61, excerpts as referenced in 62(1), required to establish the baseline utilizing the data from previous three calendar years:

61. (1) A registered person shall ensure that a baseline for each registered contaminant at a petrochemical facility is determined in accordance with this section.

(2) No later than March 31 in the year following the first full three calendar years in which this section applies in respect of the petrochemical facility mentioned in subsection (1), a baseline shall be determined by performing the following steps with respect to each ambient monitor required by subsection 60 (1) and each registered contaminant measured by the monitor:

1. For each two-week period in the previous three calendar years record one of the following,
   i. if the monitor indicates a measurement of a concentration of the registered contaminant, record the measured concentration of the registered contaminant,
   ii. if the monitor indicates that the measurement of the concentration of the registered contaminant was below the detection limit of the monitor, record half of the detection limit of the monitor as the concentration of the registered contaminant, and
   iii. if the monitor provides no indication of any measurements with respect to the concentration of the registered contaminant, do not record a concentration but instead record an explanation of why no measurement of the registered contaminant was taken.
2. Translate each concentration recorded in paragraph 1 to its equivalent natural logarithm.
3. Calculate the mean of all of the values translated in paragraph 2.
4. Calculate the square of the standard deviation of all of the values translated in paragraph 2 using the following equation:

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

Where,

S
is the standard deviation;

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

xi
is each value translated in paragraph 2;

X
is the value calculated in paragraph 3.

Relevant PCIS *Notification – Ambient monitoring,* Section 63, excerpts as referenced in 65(2)6:

> 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 a registered contaminant 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 the registered contaminant.
> 2. An explanation of the suspected cause of the statistically significant increase in the concentration of the registered contaminant.
> 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 the registered contaminant, 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 the registered contaminant.

3 MONITORING STATION LOCATIONS

The INEOS Styrolution Sarnia facility is comprised of two separate locations known as Styrene I and Styrene II. Styrene I is approximately 7.1 hectares; Styrene II is 24.5 hectares in size. The approved monitoring plan includes six monitoring stations at the Styrene I location and six monitoring stations at the Styrene II location. Appendix A contains a detailed drawing showing the monitoring station locations and property boundaries.

4 SENSITIVE RECEPTORS

A detailed drawing showing the location of sensitive receptors and their location relative to the INEOS site is provided in Appendix B. The sensitive receptors include a health care facility, senior citizen residence, long-term care facility, child care facility, educational facility, and dwellings.

5 SUMMARY OF 2018-2024 BENZENE MEASUREMENTS

A summary of the 2018-2024 property line benzene data is provided in Appendix C. The summary table includes the location of each monitor, the measured concentration of each sample at each location, and the dates for the period of time during which the monitor sampled air.

6 SUMMARY OF BENZENE ANNUAL AVERAGE CONCENTRATIONS

A summary showing the annual average benzene concentrations is provided in Appendix D.

7 STATISTICAL ANALYSIS OF AMBIENT BENZENE MEASUREMENTS

A Benzene Measurements Baseline Summary, as required by Section 61 of the PCIS, was created from the data collected in 2021-2023. This baseline summary is provided in Appendix E.

The statistical analysis shows that for all stations, the test statistic produced by the annual calculation is less than the tabulated test statistic that would indicate a significant increase corresponding to the number of degrees of freedom for each station for the current year. This indicates that there were not any statistically significant increases in concentration at any of the stations during 2024.

It is worth noting that this methodology does not provide a metric for determining whether or not a statistically significant decrease in station concentration occurred however, all of the test statistics were negative for the 2024RY which indicates that all PLM station concentrations are trending lower than the previous three year.

The statistical analysis of ambient benzene measurements is provided in Appendix F.

8 REFERENCE

Ontario Ministry of Environment, Conservation and Parks (MECP). 2020. *Technical Standards to Manage Air Pollution - Petrochemical - Industry Standard*. Version 3.0, in accordance with O.Reg 419/05. June 10, 2020.

APPENDIX A
Benzene Monitor Locations

Styrene I Unit

Styrene II Unit

LEGEND

- Ambient Air Monitor
- Emission Sources

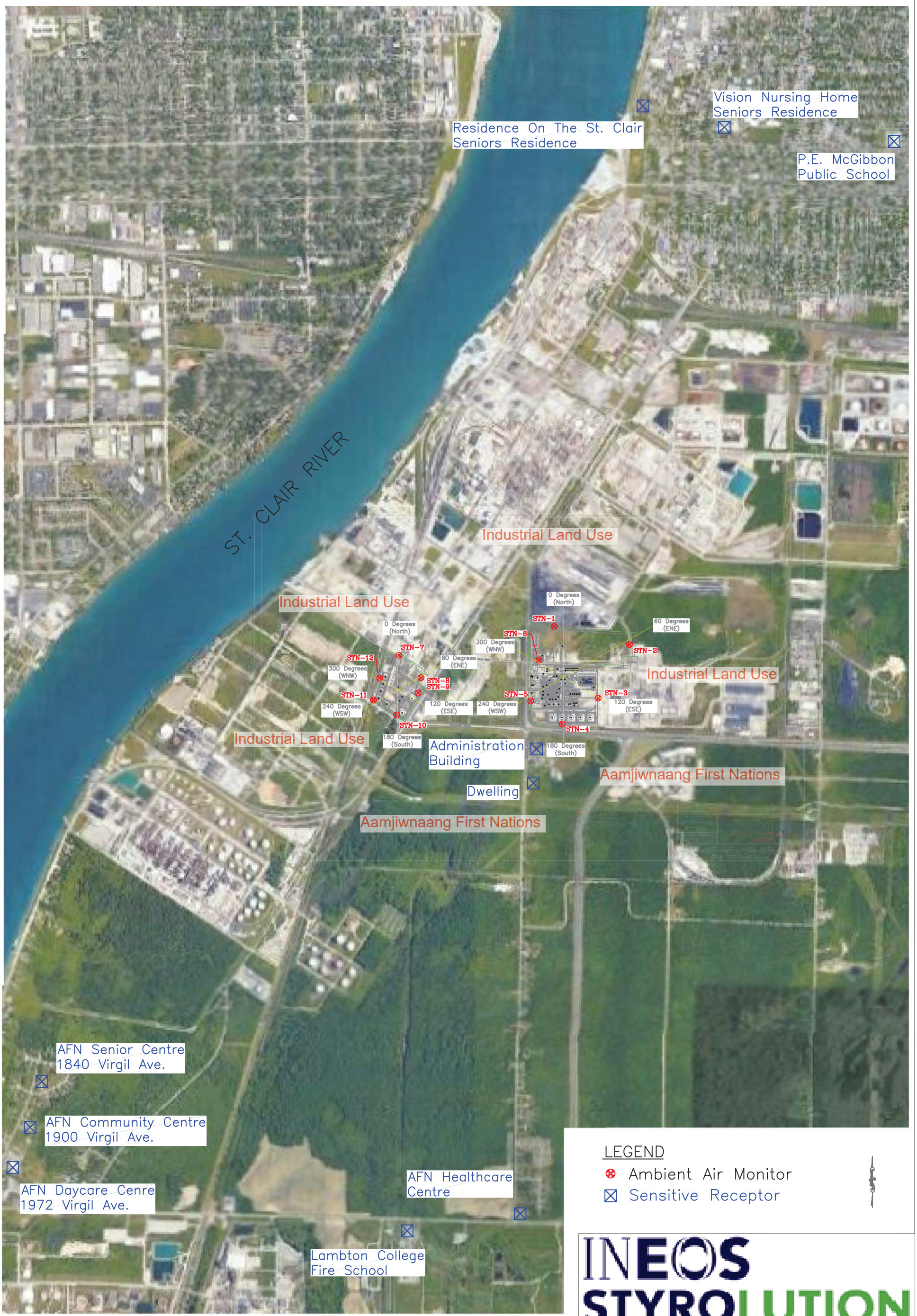
INEOS STYROLUTION

LEHDER PROJECT NUMBER: 170015	INEOS STYROLUTION CANADA LTD. SARNIA, ONTARIO
DATE: January 2018	
LEHDER DRAWING NUMBER: B-164257C-1	Property Line Monitoring Locations

0 100m 200m 300m 400m 500m

SCALE: 1:7500 (1mm=7.5meters)

APPENDIX B
Location of Sensitive Receptors


Residence On The St. Clair Seniors Residence
Vision Nursing Home Seniors Residence
P.E. McGibbon Public School
ST. CLAIR RIVER
Industrial Land Use
Industrial Land Use
Industrial Land Use
Industrial Land Use
0 Degrees (North)
60 Degrees (ENE)
120 Degrees (ESE)
180 Degrees (South)
240 Degrees (WSW)
300 Degrees (WNW)
STN-1
STN-2
STN-3
STN-4
STN-5
STN-6
STN-7
STN-8
STN-9
STN-10
STN-11
STN-12
Administration Building
Dwelling
Aamjiwnaang First Nations
Aamjiwnaang First Nations
AFN Senior Centre 1840 Virgil Ave.
AFN Community Centre 1900 Virgil Ave.
AFN Daycare Centre 1972 Virgil Ave.
AFN Healthcare Centre
Lambton College Fire School
LEGEND
Ambient Air Monitor
Sensitive Receptor
INEOS STYROLUTION
LEHDER PROJECT NUMBER: 170015
DATE: Jan. 2018
LEHDER DRAWING NUMBER: B-164257-2
INEOS STYROLUTION CANADA LTD.
SARNIA, ONTARIO
Location of Nearest Sensitive Receptors
400m 200m 0 500m 1000m
SCALE: 1:20000 (1mm=20meter)

APPENDIX C
2018-2024 Benzene PLM Monitoring Data

2024 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		19-Dec-23	2-Jan-24	16-Jan-24	30-Jan-24	13-Feb-24	27-Feb-24	12-Mar-24	26-Mar-24	9-Apr-24	23-Apr-24	7-May-24	21-May-24	4-Jun-24
Sample Retrieval Date		2-Jan-24	16-Jan-24	30-Jan-24	13-Feb-24	27-Feb-24	12-Mar-24	26-Mar-24	9-Apr-24	23-Apr-24	7-May-24	21-May-24	4-Jun-24	18-Jun-24
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
384557mE, 4755365mN	Station #1	2.73	2.27	6.82	5.04	5.30	8.45	3.94	5.99	3.41	3.94	2.60	3.54	4.04
384977mE, 4755264mN	Station #2	3.58	8.57	24.60	3.54	4.14	3.38	4.14	2.75	2.82	2.86	4.35	2.23	2.08
384802mE, 4754965mN	Station #3	11.20	33.10	120.00	20.80	19.10	20.40	18.00	13.00	22.20	7.69	6.15	6.04	6.30
384601mE, 4754820mN	Station #4	5.55	4.17	9.71	5.00	3.48	4.94	7.64	13.60	5.92	4.94	2.79	3.04	2.08
384425mE, 4754949mN	Station #5	5.46	8.02	15.60	6.43	3.89	3.61	10.60	20.90	19.10	9.20	3.46	3.53	2.64
384471mE, 4755177mN	Station #6	9.05	4.28	6.23	6.94	7.57	12.50	5.62	12.50	4.46	7.69	3.59	4.03	3.21
383689mE, 4755204mN	Station #7	1.65	2.24	3.27	3.32	3.80	5.39	2.07	3.33	2.24	2.64	3.19	2.57	3.29
383812mE, 4755079mN	Station #8	3.40	6.58	7.23	3.97	4.40	3.70	4.04	4.38	3.36	3.63	3.29	2.86	3.24
383796mE, 4754993mN	Station #9	6.18	13.60	11.60	6.88	8.03	4.24	6.19	31.90	9.43	5.27	5.02	4.49	4.94
383676mE, 4754870mN	Station #10	8.51	4.18	23.60	7.31	5.20	4.01	7.91	17.40	17.30	10.90	10.40	5.35	3.47
383547mE, 4754954mN	Station #11	13.40	8.88	4.51	3.39	1.74	4.81	6.88	8.41	4.92	4.23	4.66	3.27	1.30
383581mE, 4755077mN	Station #12	3.88	2.39	4.60	4.30	5.89	6.33	2.46	3.56	1.94	3.11	2.94	3.78	2.44

Field QA/QC Data

Field Blank #1	Location	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6
	Value (ug/m3)	<0.307	<0.311	<0.311	<0.308	<0.309	<0.307	<0.308	<0.306	<0.304	<0.302	<0.302	<0.301	<0.301
Field Duplicate	Location	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6
	Value (ug/m3)	9.36	2.34	29.10	20.20	3.84	3.39	5.48	5.42	2.80	6.28	2.88	3.33	3.07
	RPD (%)	3.43%	3.08%	18.29%	2.88%	10.34%	6.09%	2.49%	9.52%	0.71%	18.34%	3.23%	5.67%	4.36%
Field Blank #2	Location	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12
	Value (ug/m3)	<0.307	<0.311	<0.311	<0.308	<0.309	<0.307	<0.308	<0.306	<0.304	<0.302	<0.302	<0.301	<0.301
Field Duplicate	Location	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12
	Value (ug/m3)	3.80	2.31	7.07	7.22	5.23	4.63	2.33	3.25	3.39	5.45	9.96	3.18	2.42
	RPD (%)	2.06%	3.12%	2.21%	4.94%	0.58%	3.74%	5.28%	2.40%	0.89%	3.42%	4.23%	2.75%	0.82%

Notes:
1) Event 2: Potential emission sources effecting station 3 has been identified as an LDAR Leaker.
2) Event 3: Potential emission sources effecting station 3 has been identified as the repair of an LDAR leaker.
3) Event 8: Potential emission sources effecting station 9 has been identified as Tank 8.

2024 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		18-Jun-24	2-Jul-24	16-Jul-24	30-Jul-24	13-Aug-24	27-Aug-24	10-Sep-24	24-Sep-24	8-Oct-24	22-Oct-24	5-Nov-24	19-Nov-24	3-Dec-24	17-Dec-24
Sample Retrieval Date		2-Jul-24	16-Jul-24	30-Jul-24	13-Aug-24	27-Aug-24	10-Sep-24	24-Sep-24	8-Oct-24	22-Oct-24	5-Nov-24	19-Nov-24	3-Dec-24	17-Dec-24	31-Dec-24
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	ug/m3
384557mE, 4755365mN	Station #1	3.31	3.03	1.79	2.01	2.47	2.55	1.13	2.14	2.28	2.02	1.14	0.83	1.22	1.62
384977mE, 4755264mN	Station #2	2.40	2.29	1.62	1.92	1.53	2.09	0.73	1.91	2.35	1.59	1.64	1.22	1.32	1.22
384802mE, 4754965mN	Station #3	3.70	2.85	2.09	2.74	2.56	3.85	1.25	3.37	3.95	7.40	9.72	3.73	3.66	2.86
384601mE, 4754820mN	Station #4	2.30	1.96	1.63	2.00	1.75	1.90	0.87	1.78	1.87	1.06	1.23	0.91	1.18	1.53
384425mE, 4754949mN	Station #5	2.54	2.40	2.03	3.04	1.90	2.26	2.01	2.81	2.30	1.18	1.69	1.02	1.34	1.86
384471mE, 4755177mN	Station #6	3.18	3.88	1.96	1.85	2.78	4.33	2.63	2.09	1.98	2.33	1.34	0.84	1.92	2.10
383689mE, 4755204mN	Station #7	3.49	4.71	2.84	2.19	4.16	2.83	2.76	3.36	2.80	1.78	0.84	0.59	1.11	1.12
383812mE, 4755079mN	Station #8	3.48	3.80	2.28	2.78	3.20	3.03	2.56	2.90	1.64	1.14	0.87	0.74	1.13	0.91
383796mE, 4754993mN	Station #9	5.33	6.03	3.39	4.10	7.78	5.88	20.70	6.20	2.14	2.95	1.03	1.19	1.95	1.10
383676mE, 4754870mN	Station #10	3.72	9.49	7.28	21.80	4.36	7.24	5.52	21.30	1.34	0.90	0.79	0.59	0.90	0.96
383547mE, 4754954mN	Station #11	4.13	2.70	2.58	4.49	3.70	4.54	16.00	3.65	1.42	0.97	1.02	0.69	1.15	1.04
383581mE, 4755077mN	Station #12	3.25	4.79	3.73	2.69	4.98	5.21	7.93	3.38	1.73	1.03	0.95	0.83	1.00	1.04

Field QA/QC Data

Field Blank #1	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.303	<0.303	<0.303	<0.302	<0.309	<0.309	<0.306
Field Duplicate	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	3.34	2.23	1.99	2.06	1.98	4.24	1.18	1.79	3.79	1.03	1.74	0.86	1.24	1.20
	RPD (%)	0.91%	2.62%	4.78%	3.00%	4.21%	2.08%	4.42%	6.28%	4.05%	2.83%	2.96%	1.78%	1.64%	1.64%
Field Blank #2	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.303	<0.304	<0.303	<0.303	<0.309	<0.309	<0.306
Field Duplicate	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	3.48	3.76	3.20	21.40	3.54	5.30	2.82	2.78	2.14	0.85	1.02	0.87	1.08	0.93
	RPD (%)	0.29%	1.05%	5.60%	1.83%	4.32%	1.73%	2.17%	4.14%	0.00%	5.90%	0.00%	4.56%	2.70%	1.64%

2023 Benzene PLM Program

INEOS STYROLUTION

	Sample Deployment Date	20-Dec-22	3-Jan-23	17-Jan-23	31-Jan-23	14-Feb-23	28-Feb-23	14-Mar-23	28-Mar-23	11-Apr-23	25-Apr-23	9-May-23	23-May-23	6-Jun-23
	Sample Retrieval Date	3-Jan-23	17-Jan-23	31-Jan-23	14-Feb-23	28-Feb-23	14-Mar-23	28-Mar-23	11-Apr-23	25-Apr-23	9-May-23	23-May-23	6-Jun-23	20-Jun-23
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
384557mE, 4755365mN	Station #1	5.35	4.61	4.22	6.22	7.11	3.92	5.13	4.53	3.16	2.73	3.55	3.00	3.42
384977mE, 4755264mN	Station #2	6.25	4.99	5.09	6.38	3.50	5.40	4.80	4.06	6.40	3.24	5.76	4.06	5.27
384802mE, 4754965mN	Station #3	42.50	15.20	49.70	46.80	25.70	7.98	27.80	20.40	23.80	11.20	20.40	8.53	11.40
384601mE, 4754820mN	Station #4	3.71	52.40	7.63	3.18	9.95	19.00	6.70	3.11	5.47	6.67	4.38	8.08	9.57
384425mE, 4754949mN	Station #5	8.40	3.50	10.70	2.64	14.20	19.20	3.42	2.84	5.61	8.17	3.07	6.99	6.27
384471mE, 4755177mN	Station #6	7.19	12.80	5.48	5.70	8.33	4.18	2.58	6.27	4.16	6.18	3.52	5.75	4.00
383689mE, 4755204mN	Station #7	3.40	2.06	2.41	3.13	3.35	2.14	2.72	2.92	3.07	2.62	4.82	2.57	3.24
383812mE, 4755079mN	Station #8	3.99	2.90	4.49	5.76	4.10	3.48	4.54	3.06	4.70	7.59	5.02	3.49	3.43
383796mE, 4754993mN	Station #9	10.90	5.34	9.50	9.26	15.50	9.30	11.90	5.81	9.46	66.00	7.52	4.55	4.73
383676mE, 4754870mN	Station #10	16.00	3.67	9.58	1.59	13.00	30.70	6.80	4.58	12.00	10.00	9.26	8.61	12.20
383547mE, 4754954mN	Station #11	4.06	5.45	6.62	2.59	4.71	8.91	2.00	2.80	3.02	6.86	4.44	2.63	5.38
383581mE, 4755077mN	Station #12	2.66	7.60	2.74	2.28	4.22	3.54	1.47	2.77	4.50	4.53	3.83	3.61	4.97

Field QA/QC Data

Field Blank #1	Location	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4
	Value (ug/m3)	<0.307	<0.310	<0.309	<0.311	<0.308	<0.307	<0.309	<0.308	<0.302	<0.306	<0.302	<0.301	<0.301
Field Duplicate	Location	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4
	Value (ug/m3)	3.66	3.21	5.71	5.65	3.37	7.42	6.50	2.43	4.52	2.86	5.67	8.23	9.12
	RPD (%)	1.35%	8.29%	4.20%	9.16%	3.71%	7.02%	2.99%	14.44%	8.65%	4.76%	1.56%	3.52%	4.70%
Field Blank #2	Location	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10
	Value (ug/m3)	<0.307	<0.310	<0.309	<0.311	<0.308	<0.318	<0.309	<0.308	<0.302	<0.306	<0.302	<0.301	<0.301
Field Duplicate	Location	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10
	Value (ug/m3)	17.60	5.41	2.58	3.06	4.10	8.59	6.57	2.48	4.49	2.56	5.05	4.64	11.90
	RPD (%)	10.00%	0.73%	5.84%	2.24%	0.00%	7.63%	3.38%	11.43%	0.22%	2.29%	0.60%	1.98%	2.46%

Notes:
Event 1, Event 2, Event 3, and Event 4: Potential sources of emissions affecting Station 3 have been identified as MT-303 (Benzene storage tank).

2023 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		20-Jun-23	4-Jul-23	18-Jul-23	1-Aug-23	15-Aug-23	29-Aug-23	12-Sep-23	26-Sep-23	10-Oct-23	24-Oct-23	7-Nov-23	21-Nov-23	5-Dec-23
Sample Retrieval Date		4-Jul-23	18-Jul-23	1-Aug-23	15-Aug-23	29-Aug-23	12-Sep-23	26-Sep-23	10-Oct-23	24-Oct-23	7-Nov-23	21-Nov-23	5-Dec-23	19-Dec-23
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
384557mE, 4755365mN	Station #1	3.94	3.93	4.36	1.99	5.85	4.59	2.42	2.84	2.39	7.58	5.61	2.38	5.18
384977mE, 4755264mN	Station #2	3.53	6.18	4.57	3.74	4.91	5.40	2.83	3.01	3.17	7.34	4.83	7.11	5.61
384802mE, 4754965mN	Station #3	16.00	30.90	30.40	21.30	14.20	32.80	9.75	13.30	9.56	42.60	27.60	34.00	23.70
384601mE, 4754820mN	Station #4	7.66	4.71	3.97	4.39	4.30	4.46	3.43	4.42	2.43	5.62	7.22	4.49	2.35
384425mE, 4754949mN	Station #5	9.86	6.02	3.20	6.35	14.70	4.25	4.85	4.51	2.73	8.24	5.50	6.35	2.23
384471mE, 4755177mN	Station #6	7.15	4.26	3.26	2.56	3.92	4.07	4.57	3.33	1.90	3.79	5.19	3.56	7.90
383689mE, 4755204mN	Station #7	3.74	5.31	4.41	1.88	2.56	2.92	2.49	2.97	2.33	3.29	3.06	1.45	2.30
383812mE, 4755079mN	Station #8	3.54	4.08	4.19	2.55	2.42	2.80	2.19	2.60	2.51	7.47	3.36	4.16	6.48
383796mE, 4754993mN	Station #9	5.50	6.26	5.54	3.60	5.01	3.70	5.08	5.06	11.20	24.50	5.02	8.94	12.70
383676mE, 4754870mN	Station #10	16.60	10.10	3.97	11.00	11.60	3.75	14.80	7.77	9.48	13.20	6.02	11.20	1.60
383547mE, 4754954mN	Station #11	11.00	4.40	3.00	3.22	2.26	2.98	11.70	8.08	1.96	2.71	7.80	2.97	2.56
383581mE, 4755077mN	Station #12	6.29	3.79	3.74	2.21	2.25	2.34	4.74	4.32	1.99	2.41	2.92	2.87	3.18

Field QA/QC Data

Field Blank #1	Location	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.304	<0.304	<0.306	<0.308	<0.307
Field Duplicate	Location	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5
	Value (ug/m3)	7.92	4.64	4.88	3.74	13.50	4.77	4.42	3.32	2.40	7.31	25.00	4.52	2.07
	RPD (%)	19.68%	8.92%	11.93%	0.00%	4.93%	6.95%	8.87%	0.30%	0.42%	0.41%	9.42%	0.67%	7.17%
Field Blank #2	Location	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.301	<0.304	<0.304	<0.306	<0.308	<0.307
Field Duplicate	Location	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11
	Value (ug/m3)	10.40	3.90	4.43	2.60	5.06	3.66	10.90	4.40	2.30	7.78	5.00	10.30	2.37
	RPD (%)	5.45%	2.90%	0.45%	1.96%	1.00%	2.40%	6.84%	1.85%	1.29%	4.15%	0.40%	8.04%	7.42%

2022 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		21-Dec-21	4-Jan-22	18-Jan-22	1-Feb-22	15-Feb-22	1-Mar-22	15-Mar-22	29-Mar-22	12-Apr-22	26-Apr-22	10-May-22	24-May-22	7-Jun-22
Sample Retrieval Date		4-Jan-22	18-Jan-22	1-Feb-22	15-Feb-22	1-Mar-22	15-Mar-22	29-Mar-22	12-Apr-22	26-Apr-22	10-May-22	24-May-22	7-Jun-22	21-Jun-22
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
384557mE, 4755365mN	Station #1	2.48	2.36	3.71	3.06	3.21	2.86	2.25	3.79	3.08	3.86	5.21	4.17	3.75
384977mE, 4755264mN	Station #2	3.57	5.39	3.12	7.05	6.20	3.99	3.91	2.49	2.38	3.07	4.22	3.91	5.04
384802mE, 4754965mN	Station #3	27.90	47.10	30.00	122.00	26.40	26.50	20.20	15.10	18.60	8.05	29.60	20.50	26.20
384601mE, 4754820mN	Station #4	3.92	9.25	2.21	3.17	7.06	3.97	6.14	3.04	5.95	8.96	6.05	4.10	6.27
384425mE, 4754949mN	Station #5	3.62	7.33	1.98	2.23	4.52	3.66	4.23	4.17	4.53	7.16	10.20	6.41	5.50
384471mE, 4755177mN	Station #6	3.44	3.03	2.61	2.01	3.35	3.66	2.22	7.16	4.13	5.91	7.50	5.40	5.35
383689mE, 4755204mN	Station #7	2.29	1.86	2.51	5.96	2.33	2.89	2.16	1.92	1.59	2.40	2.24	4.84	5.68
383812mE, 4755079mN	Station #8	2.69	2.05	2.80	8.71	5.38	3.63	3.28	2.19	2.20	3.06	2.81	3.56	5.98
383796mE, 4754993mN	Station #9	4.09	4.94	4.16	12.80	9.77	6.54	4.55	3.44	3.82	4.51	4.19	4.53	7.49
383676mE, 4754870mN	Station #10	10.10	12.40	3.15	7.46	14.60	11.20	11.80	6.00	13.70	19.70	7.02	6.11	16.50
383547mE, 4754954mN	Station #11	6.39	5.70	1.73	1.46	3.11	4.20	5.25	4.67	3.57	7.33	3.44	7.21	6.17
383581mE, 4755077mN	Station #12	4.00	2.24	3.94	2.13	3.18	2.32	2.26	4.64	2.67	3.53	4.36	3.42	4.74

Field QA/QC Data

Field Blank #1	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	<0.30	<0.31	<0.31	<0.312	<0.311	<0.310	<0.308	<0.307	<0.304	<0.304	<0.301	<0.301	<0.301
Field Duplicate	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	3.81	46.90	2.21	2.18	3.17	2.75	4.04	15.00	6.20	7.33	7.95	3.98	5.06
	RPD (%)	6.72%	0.42%	0.00%	2.24%	5.37%	3.85%	3.32%	0.66%	4.20%	2.37%	6.00%	4.56%	0.40%
Field Blank #2	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	<0.30	<0.31	<0.31	<0.312	<0.311	<0.310	<0.308	<0.307	<0.304	<0.304	<0.301	<0.301	<0.301
Field Duplicate	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	2.59	4.92	3.18	1.38	3.12	2.66	3.33	3.33	14.10	7.74	4.13	4.69	5.79
	RPD (%)	3.72%	0.40%	0.95%	5.48%	1.89%	7.96%	1.52%	3.20%	2.92%	5.59%	5.28%	3.10%	3.18%

Notes:

1)Event 1 and 2: Potential sources of emissions affecting Station 3 have been identified as the contaminated material from the December 4th, 2021 hydrocarbon (benzene) release stored securely nearby until scheduled for removal.

2) Event 4, 18, 20 and 22: Potential sources of emissions affecting Station 3 have been identified as MT-303 (benzene storage tank).

3) Event 14, 16 and 17: Potential sources of emissions affecting Station 3 have been identified as MT-303 (benzene storage tank), as well as contaminated material from the planned maintenance outage stored securely nearby until scheduled for removal.

4) Event 22: No potential sources of emissions affecting Station 9 have been confirmed.

2022 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		21-Jun-22	5-Jul-22	19-Jul-22	2-Aug-22	16-Aug-22	30-Aug-22	13-Sep-22	27-Sep-22	11-Oct-22	25-Oct-22	8-Nov-22	22-Nov-22	6-Dec-22
Sample Retrieval Date		5-Jul-22	19-Jul-22	2-Aug-22	16-Aug-22	30-Aug-22	13-Sep-22	27-Sep-22	11-Oct-22	25-Oct-22	8-Nov-22	22-Nov-22	6-Dec-22	20-Dec-22
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
384557mE, 4755365mN	Station #1	4.06	3.64	3.33	6.38	6.58	10.40	8.33	2.42	4.95	4.23	2.45	6.81	2.67
384977mE, 4755264mN	Station #2	6.27	5.41	5.87	8.84	8.99	6.20	6.06	4.59	3.90	2.74	4.19	5.54	3.86
384802mE, 4754965mN	Station #3	41.00	27.00	73.00	46.60	77.30	17.80	39.80	20.20	31.00	28.20	27.50	43.00	13.90
384601mE, 4754820mN	Station #4	3.14	4.77	2.01	11.30	6.84	9.33	6.75	7.33	0.94	3.36	9.92	2.30	11.40
384425mE, 4754949mN	Station #5	3.36	4.65	2.04	13.70	5.90	18.20	8.82	12.20	1.01	4.02	6.69	2.78	23.40
384471mE, 4755177mN	Station #6	6.06	3.42	2.05	9.51	12.10	28.60	18.50	2.15	6.65	5.63	1.76	9.12	5.64
383689mE, 4755204mN	Station #7	7.50	4.43	4.72	4.84	4.32	3.44	6.00	4.54	3.98	3.76	2.34	4.12	1.87
383812mE, 4755079mN	Station #8	6.42	3.93	3.72	4.05	4.04	1.74	7.14	4.86	6.41	2.90	3.54	6.32	3.87
383796mE, 4754993mN	Station #9	9.20	5.89	5.87	5.88	6.06	2.76	12.20	5.37	74.30	4.78	9.38	9.97	6.96
383676mE, 4754870mN	Station #10	6.93	13.30	3.91	14.80	4.85	9.41	9.94	14.40	0.56	5.22	10.20	4.40	24.50
383547mE, 4754954mN	Station #11	2.65	5.84	1.67	3.39	3.30	5.25	5.26	2.74	0.97	3.05	5.76	2.41	7.35
383581mE, 4755077mN	Station #12	4.25	5.19	2.11	3.24	4.73	5.31	5.91	3.18	2.62	3.58	1.66	4.08	2.61

Field QA/QC Data

Field Blank #1	Location	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.322	<0.301	<0.302	<0.304	<0.303	<0.308	<0.307	<0.310
Field Duplicate	Location	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3
	Value (ug/m3)	40.80	4.87	2.09	9.21	6.83	6.07	39.30	7.42	0.99	5.04	2.43	5.81	13.90
	RPD (%)	0.49%	2.10%	2.45%	3.15%	3.80%	2.10%	1.26%	1.23%	2.08%	10.48%	0.82%	4.87%	0.00
Field Blank #2	Location	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9
	Value (ug/m3)	<0.301	<0.301	<0.301	<0.301	<0.301	<0.322	<0.301	<0.302	<0.304	<0.303	<0.308	<0.307	<0.310
Field Duplicate	Location	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9
	Value (ug/m3)	9.13	12.60	1.71	3.53	4.11	1.58	12.70	14.40	0.75	3.62	2.41	6.56	6.40
	RPD (%)	0.76%	5.26%	2.40%	8.95%	4.86%	9.20%	4.10%	0.00%	22.05%	1.12%	2.99%	3.80%	8.05%

2021 Benzene PLM Program

INEOS STYROLUTION

	Sample Deployment Date	22-Dec-20	5-Jan-21	19-Jan-21	2-Feb-21	17-Feb-21	2-Mar-21	16-Mar-21	30-Mar-21	13-Apr-21	27-Apr-21	11-May-21	25-May-21	8-Jun-21
	Sample Retrieval Date	5-Jan-21	19-Jan-21	2-Feb-21	17-Feb-21	2-Mar-21	16-Mar-21	30-Mar-21	13-Apr-21	27-Apr-21	11-May-21	25-May-21	8-Jun-21	22-Jun-21
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
384557mE, 4755365mN	Station #1	2.74	2.56	2.71	2.75	3.06	2.28	3.86	3.67	See Note 4	2.52	3.18	2.93	3.62
384977mE, 4755264mN	Station #2	2.18	5.09	2.64	4.76	3.25	3.23	2.95	2.69	See Note 4	4.85	5.85	6.61	3.40
384802mE, 4754965mN	Station #3	17.40	20.30	7.48	25.90	19.60	18.40	14.10	19.10	See Note 4	18.70	36.40	39.20	13.00
384601mE, 4754820mN	Station #4	4.31	3.12	5.12	8.39	6.15	4.73	3.20	3.04	See Note 4	4.19	2.72	3.74	4.13
384425mE, 4754949mN	Station #5	3.00	3.35	3.84	4.48	4.00	3.71	2.37	2.69	See Note 4	3.19	2.44	3.37	3.37
384471mE, 4755177mN	Station #6	2.68	2.83	2.64	2.52	4.41	2.30	4.16	4.95	See Note 4	2.62	2.48	2.26	2.86
383689mE, 4755204mN	Station #7	2.78	2.88	1.66	2.75	7.55	2.45	6.31	3.65	See Note 4	2.81	6.16	4.21	2.25
383812mE, 4755079mN	Station #8	2.96	8.70	4.97	6.77	7.74	5.72	5.67	2.67	See Note 4	3.88	5.88	4.72	2.89
383796mE, 4754993mN	Station #9	5.91	15.30	9.67	14.40	14.60	10.10	8.01	3.79	See Note 4	14.90	8.07	7.80	4.15
383676mE, 4754870mN	Station #10	13.20	13.00	39.00	28.00	28.90	15.10	11.20	4.34	See Note 4	6.67	3.14	10.50	7.18
383547mE, 4754954mN	Station #11	6.46	5.95	5.92	6.01	9.98	6.78	5.27	6.27	See Note 4	4.19	2.88	2.16	5.54
383581mE, 4755077mN	Station #12	7.62	4.57	5.91	4.27	20.50	4.57	7.88	6.51	See Note 4	3.81	3.88	2.22	2.57

Field QA/QC Data

Field Blank #1	Location	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1		Station #3	Station #4	Station #5	Station #6
	Value (ug/m3)	<0.31	<0.31	<0.32	<0.30	<0.34	<0.31	<0.31	<0.31	See Note 4	<0.31	<0.30	<0.30	<0.30
Field Duplicate	Location	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1		Station #3	Station #4	Station #5	Station #6
	Value (ug/m3)	2.71	2.31	2.61	24.50	6.00	3.73	4.11	3.68	See Note 4	18.70	2.57	3.35	2.74
	RPD (%)	1.12%	9.77%	1.14%	5.41%	2.44%	0.54%	1.20%	0.27%	See Note 4	0.00%	5.51%	0.59%	4.20%
Field Blank #2	Location	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7		Station #9	Station #10	Station #11	Station #12
	Value (ug/m3)	<0.31	<0.31	<0.32	<0.30	<0.34	<0.31	<0.31	<0.31	See Note 4	<0.31	<0.30	<0.30	<0.30
Field Duplicate	Location	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7		Station #9	Station #10	Station #11	Station #12
	Value (ug/m3)	8.16	2.93	5.02	14.40	28.50	6.84	7.92	3.51	See Note 4	15.60	3.32	2.46	2.52
	RPD (%)	7.09%	1.74%	1.01%	0.00%	1.38%	0.88%	0.51%	3.84%	See Note 4	4.70%	5.73%	13.89%	1.95%

Notes:
1) Event 4 sampling period was 15 days. Sample retreival was delayed due to weather (snow).
2) Event 5 sampling period was 13 days. Sample deployment was delayed due to weather (snow).
3) Event 3: Potential source of emissions affecting Station 10 has been identified as Tank 8 (benzene storage tank).
4) Event 9: no data available for this event due to laboratory instrumentation failure.
5) Events 11, 12, 17, & 18: Potential sources of emissions affecting Station 3 have been identified as MT-303 (benzene storage tank) and sewer drains in the Station 3 area.
6) Event 24: no data avaliable for station 8 during this event due to damage to tube
7) Event 25: Potential sources of emissions affecting Station 3 include a hydrocarbon (benzene) release on-site on December 4, 2021. Foam was applied to affected area to reduce emissions, clean up occurred same day, and the release was reported to the MECP Spills Action Centre. CVECO Code 8 was also issued.
8) Event 26: Potential sources of emissions affecting Station 3 have been identified as the contaminated material from the December 4th, 2021 hydrocarbon (benzene) release stored securely nearby until scheduled for removal.

2021 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		22-Jun-21	6-Jul-21	20-Jul-21	3-Aug-21	17-Aug-21	31-Aug-21	14-Sep-21	28-Sep-21	12-Oct-21	26-Oct-21	9-Nov-21	23-Nov-21	7-Dec-21
Sample Retrieval Date		6-Jul-21	20-Jul-21	3-Aug-21	17-Aug-21	31-Aug-21	14-Sep-21	28-Sep-21	12-Oct-21	26-Oct-21	9-Nov-21	23-Nov-21	7-Dec-21	21-Dec-21
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
384557mE, 4755365mN	Station #1	2.71	2.93	2.52	4.51	2.95	2.13	1.84	2.64	2.26	2.08	1.70	2.41	2.14
384977mE, 4755264mN	Station #2	4.59	3.35	4.29	4.01	5.12	2.69	2.40	2.03	3.72	3.51	2.57	3.80	6.33
384802mE, 4754965mN	Station #3	26.40	13.80	18.60	34.60	37.50	13.70	12.90	15.50	22.40	22.10	18.20	147.00	96.40
384601mE, 4754820mN	Station #4	3.10	5.88	3.57	2.77	5.49	3.71	1.94	8.08	3.29	6.46	2.07	3.39	4.40
384425mE, 4754949mN	Station #5	2.14	5.87	2.72	4.04	3.91	3.11	2.07	6.12	3.78	5.22	2.38	3.10	3.56
384471mE, 4755177mN	Station #6	2.06	3.23	2.39	3.19	2.54	1.85	2.63	3.91	2.33	1.86	2.11	2.74	3.56
383689mE, 4755204mN	Station #7	4.94	2.09	1.87	7.06	3.20	2.54	2.55	2.94	2.72	2.97	1.61	2.03	1.58
383812mE, 4755079mN	Station #8	6.23	2.40	1.92	5.53	3.28	2.66	2.94	2.58	3.37	2.73	see note 6	1.81	5.12
383796mE, 4754993mN	Station #9	10.20	3.41	2.75	7.80	4.67	3.48	4.41	3.18	6.19	3.74	4.34	3.04	10.20
383676mE, 4754870mN	Station #10	3.57	19.20	3.89	7.79	9.70	8.46	4.87	16.10	13.10	9.61	1.20	0.94	17.80
383547mE, 4754954mN	Station #11	2.29	7.03	2.14	3.30	4.23	5.50	4.33	6.42	2.01	2.47	3.27	2.37	4.12
383581mE, 4755077mN	Station #12	2.03	2.49	2.11	23.00	3.72	2.20	3.50	4.46	2.62	2.05	1.80	1.83	2.59

Field QA/QC Data

Field Blank #1	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31
Field Duplicate	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	2.63	3.43	18.30	2.83	3.93	1.95	1.77	1.95	22.20	6.89	2.43	2.65	2.18
	RPD (%)	2.95%	2.39%	1.61%	2.17%	0.51%	5.41%	3.80%	3.94%	0.89%	6.66%	2.10%	3.28%	0.02
Field Blank #2	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31
Field Duplicate	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	4.69	2.32	2.81	7.76	4.31	2.22	2.44	2.50	6.12	8.70	3.41	1.72	1.62
	RPD (%)	5.06%	3.33%	2.18%	0.39%	1.89%	0.91%	4.31%	3.10%	1.13%	9.47%	4.28%	6.01%	2.53%

2020 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		23-Dec-19	7-Jan-20	21-Jan-20	4-Feb-20	18-Feb-20	3-Mar-20	17-Mar-20	31-Mar-20	14-Apr-20	28-Apr-20	12-May-20	26-May-20	9-Jun-20
Sample Retrieval Date		7-Jan-20	21-Jan-20	4-Feb-20	18-Feb-20	3-Mar-20	17-Mar-20	31-Mar-20	14-Apr-20	28-Apr-20	12-May-20	26-May-20	9-Jun-20	23-Jun-20
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
384557mE, 4755365mN	Station #1	2.41	2.59	2.71	2.65	3.31	5.77	-----	-----	-----	4.23	3.70	3.64	3.38
384977mE, 4755264mN	Station #2	4.46	2.78	5.39	3.54	7.24	4.56	-----	-----	-----	4.41	3.22	5.01	3.60
384802mE, 4754965mN	Station #3	37.70	17.90	28.70	30.00	44.40	46.30	-----	-----	-----	21.00	22.00	29.30	17.50
384601mE, 4754820mN	Station #4	3.07	3.06	4.10	5.96	4.51	4.70	-----	-----	-----	6.38	9.75	4.85	6.72
384425mE, 4754949mN	Station #5	4.00	No Value (See Note 2)	4.32	4.36	3.39	4.84	-----	-----	-----	3.68	7.92	2.49	5.29
384471mE, 4755177mN	Station #6	3.46	4.08	No Value (See Note 3)	2.48	2.61	5.17	-----	-----	-----	4.78	5.37	5.12	5.04
383689mE, 4755204mN	Station #7	5.61	2.85	7.04	3.48	3.46	3.85	-----	-----	-----	4.49	3.61	3.20	4.46
383812mE, 4755079mN	Station #8	8.50	4.60	16.50	7.95	10.20	6.21	-----	-----	-----	6.29	4.27	5.46	7.17
383796mE, 4754993mN	Station #9	16.30	7.22	26.40	13.90	16.50	9.07	-----	-----	-----	7.07	5.77	7.93	10.50
383676mE, 4754870mN	Station #10	4.29	1.93	33.80	39.30	6.45	9.16	-----	-----	-----	17.20	16.60	10.30	29.40
383547mE, 4754954mN	Station #11	7.29	15.80	21.30	8.23	2.81	6.06	-----	-----	-----	3.88	8.86	2.13	4.91
383581mE, 4755077mN	Station #12	4.55	9.66	11.40	5.13	2.36	5.94	-----	-----	-----	3.13	4.44	4.86	6.26

Field QA/QC Data

Field Blank #1	Location	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3				Station #1	Station #2	Station #3	Station #4
	Value (ug/m3)	<0.29	<0.31	<0.31	<0.32	<0.31	<0.31	-----	-----	-----	<0.31	<0.31	<0.30	<0.30
Field Duplicate	Location	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3				Station #1	Station #2	Station #3	Station #4
	Value (ug/m3)	2.90	No Value (See Note 2)	No Value (See Note 3)	2.41	7.28	41.80	-----	-----	-----	3.94	3.21	28.90	7.24
	RPD (%)	5.54%	#VALUE!	#VALUE!	9.06%	0.55%	9.72%	-----	-----	-----	6.86%	0.31%	1.37%	7.74%
Field Blank #2	Location	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9				Station #7	Station #8	Station #9	Station #10
	Value (ug/m3)	<0.29	<0.31	<0.31	<0.32	<0.31	<0.31	-----	-----	-----	<0.31	<0.31	<0.30	<0.30
Field Duplicate	Location	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9				Station #7	Station #8	Station #9	Station #10
	Value (ug/m3)	4.21	15.70	11.90	3.09	9.91	8.80	-----	-----	-----	4.23	4.27	7.51	29.10
	RPD (%)	1.86%	0.63%	4.39%	11.21%	2.84%	2.98%	-----	-----	-----	5.79%	0.00%	5.30%	1.02%

Notes:

1) Event 1, 4, 5, 6 & 18: Potential sources of emissions affecting Station 3 have been identified as MT-303 (benzene storage tank) and sewer drains in the Station 3 area.
2) Event 2 Station 5: No values reported due to error by field technician.
3) Event 3 Station 6: No values reported due to error by field technician.
4) Event 3 & 4: Potential source of emissions affecting Station 10 has been identified as 1Tank8 (benzene storage tank).
5) RPD is Relative Percent Difference (Difference / Mean expressed as a percent). Used as the default precision evaluation.
6) Events 7, 8 & 9: Due to COVID-19 measures, 3rd party contractor access to site has been limited with the main focus being to safeguard the health and safety of front-line personnel. Therefore, property line monitoring (PLM) was put on hold during this time. PLM will re-start April 28, 2020.
7) Event 20, Stations 3, 4, 8 & 12: Data for these samples have been omitted due to laboratory quality control criteria not meeting the method requirements.
8) Event 20, Station 11: The data for Station 11 is not reportable due to quality control criteria not meeting method requirements however, the duplicate sample for Station 11 was acceptable and has been reported as the data value for Station 11. It is expected that offsite work on benzene equipment owned by an external facility contributed to the value reported, based upon the nature of the work, wind direction, and proximity to the Station 11 monitor.
9) Event 23 Station 3: Wind direction during the sampling period points to MT-303 (benzene storage tank) as the most likely potential contributor to values measured at Station 3.

2020 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		23-Jun-20	7-Jul-20	21-Jul-20	4-Aug-20	18-Aug-20	1-Sep-20	15-Sep-20	29-Sep-20	13-Oct-20	27-Oct-20	10-Nov-20	24-Nov-20	8-Dec-20
Sample Retrieval Date		7-Jul-20	21-Jul-20	4-Aug-20	18-Aug-20	1-Sep-20	15-Sep-20	29-Sep-20	13-Oct-20	27-Oct-20	10-Nov-20	24-Nov-20	8-Dec-20	22-Dec-20
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
384557mE, 4755365mN	Station #1	2.04	3.22	2.89	4.32	5.09	3.31	3.59	3.03	3.01	2.52	2.97	3.49	2.69
384977mE, 4755264mN	Station #2	4.14	5.42	4.25	4.20	5.78	2.39	5.89	4.19	3.32	4.39	3.46	6.60	4.12
384802mE, 4754965mN	Station #3	23.60	29.40	19.60	25.30	35.00	12.50	See Note 7	19.00	18.00	40.60	19.70	28.60	24.00
384601mE, 4754820mN	Station #4	6.84	4.87	6.20	6.43	3.02	4.20	See Note 7	2.73	4.09	1.67	3.53	2.93	6.77
384425mE, 4754949mN	Station #5	3.17	4.03	4.93	7.14	3.36	5.08	2.64	3.55	3.47	1.08	3.15	2.27	3.80
384471mE, 4755177mN	Station #6	2.34	3.79	2.84	4.47	3.38	3.09	3.23	3.84	3.10	1.64	2.81	3.27	2.51
383689mE, 4755204mN	Station #7	3.29	4.41	2.59	7.23	7.06	3.87	4.46	2.16	2.03	6.50	3.67	2.24	5.64
383812mE, 4755079mN	Station #8	7.00	6.76	4.28	8.14	8.02	3.15	See Note 7	4.46	3.66	11.10	5.61	11.30	8.61
383796mE, 4754993mN	Station #9	11.20	10.10	7.97	12.00	13.60	4.87	12.10	7.58	6.32	13.40	8.72	16.00	12.30
383676mE, 4754870mN	Station #10	9.94	18.20	25.20	18.50	9.96	16.90	4.54	6.99	11.30	1.19	9.21	1.51	22.30
383547mE, 4754954mN	Station #11	3.29	5.02	6.79	7.96	6.85	6.34	35.50	7.47	4.65	1.47	7.51	4.40	4.53
383581mE, 4755077mN	Station #12	3.79	6.53	3.54	6.09	6.23	5.66	See Note 7	3.29	2.49	4.19	5.31	3.76	5.35

Field QA/QC Data

Field Blank #1	Location	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Field Duplicate	Location	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5
	Value (ug/m3)	3.00	3.81	2.88	4.22	34.30	4.64	2.58	3.86	3.06	4.39	19.00	2.73	3.78
	RPD (%)	5.36%	0.53%	0.35%	0.48%	2.00%	10.48%	2.27%	0.52%	1.66%	0.00%	3.55%	6.83%	0.53%
Field Blank #2	Location	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Field Duplicate	Location	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11
	Value (ug/m3)	3.37	6.51	2.50	8.03	13.90	16.40	See Note 8	3.37	1.89	10.80	7.95	1.44	4.55
	RPD (%)	2.43%	0.31%	3.47%	1.35%	2.21%	2.96%	-----	2.43%	6.90%	2.70%	8.83%	4.64%	0.44%

2019 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		24-Dec-18	8-Jan-19	22-Jan-19	5-Feb-19	19-Feb-19	5-Mar-19	24-Dec-18	8-Jan-19	22-Jan-19	30-Apr-19	14-May-19	28-May-19	11-Jun-19
Sample Retrieval Date		8-Jan-19	22-Jan-19	5-Feb-19	19-Feb-19	5-Mar-19	19-Mar-19	2-Apr-19	16-Apr-19	30-Apr-19	14-May-19	28-May-19	11-Jun-19	25-Jun-19
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
384557mE, 4755365mN	Station #1	3.29	3.27	9.26	3.34	3.25	5.23	6.03	4.13	4.34	1.94	3.98	3.48	3.41
384977mE, 4755264mN	Station #2	5.75	4.48	67.90	2.83	3.83	4.53	5.73	3.18	2.43	2.83	3.97	3.83	3.91
384802mE, 4754965mN	Station #3	27.50	14.10	>80	12.60	21.30	22.10	32.30	14.90	14.30	15.60	25.20	22.30	18.90
384601mE, 4754820mN	Station #4	3.83	4.34	3.55	12.20	10.40	6.21	8.08	9.03	8.34	12.80	8.63	7.61	6.75
384425mE, 4754949mN	Station #5	3.33	4.75	7.43	10.50	9.46	9.09	4.56	7.52	4.84	8.20	4.98	4.67	2.38
384471mE, 4755177mN	Station #6	4.87	4.86	4.79	5.12	7.05	6.67	3.73	4.82	5.67	8.70	5.42	4.05	3.95
383689mE, 4755204mN	Station #7	2.08	1.46	11.40	3.37	2.85	13.30	10.60	3.28	6.37	1.86	2.64	3.27	3.58
383812mE, 4755079mN	Station #8	1.39	1.31	53.00	5.30	7.49	17.30	14.30	5.08	3.61	3.56	4.51	6.37	5.63
383796mE, 4754993mN	Station #9	1.33	1.30	>80	10.20	15.90	38.50	18.30	10.10	5.32	5.68	6.70	10.20	8.99
383676mE, 4754870mN	Station #10	1.50	1.05	3.47	65.60	28.60	2.15	29.40	93.70	77.30	61.30	16.70	20.70	9.77
383547mE, 4754954mN	Station #11	2.13	1.59	8.70	8.36	15.20	27.30	3.23	20.50	15.40	5.85	8.16	6.68	4.32
383581mE, 4755077mN	Station #12	12.20	1.84	5.25	5.97	6.73	33.30	7.79	8.42	13.40	2.19	4.03	2.90	4.04

Field QA/QC Data

Field Blank #1	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	<0.29	<0.32	<0.32	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.29	<0.31	<0.30	<0.30
Field Duplicate	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2
	Value (ug/m3)	5.79	13.40	3.39	10.90	7.18	5.25	5.60	13.90	8.37	8.30	5.22	3.55	3.88
	RPD (%)	0.70%	4.96%	4.51%	3.81%	1.84%	0.38%	2.27%	6.71%	0.36%	1.22%	3.69%	2.01%	0.77%
Field Blank #2	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	<0.29	<0.32	<0.32	<0.32	<0.32	<0.31	<0.31	<0.31	<0.31	<0.29	<0.31	<0.30	<0.30
Field Duplicate	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8
	Value (ug/m3)	1.36	1.31	3.54	8.43	6.83	12.70	13.80	9.48	75.50	5.76	3.99	3.55	5.27
	RPD (%)	2.16%	0.77%	2.02%	0.84%	1.49%	4.51%	3.50%	6.14%	2.33%	1.54%	0.99%	8.56%	6.39%

Notes:
1) RPD is Relative Percent Difference (Difference / Mean expressed as a percent). Used as the default precision evaluation.
2) Event 3 Stations 8 & 9: January 27 to January 28, 2019, during the re-filling of a benzene storage tank (after inspection), INEOS Styrolution Sarnia Site received. grab sample analysis indicating increased levels of benzene at Styrene 1. The Ministry of the Environment, Conservation & Parks (MECP) Spills Action Centre was notified and subsequent updates were provided. A portable thermal oxidizer to control emissions was utilized during tank filling. According to the CASA air quality monitoring data website, the winds were from the west during this time. Air quality results from the station were in the "good" range.
3) Event 3 Station 2 & 3, Event 7 Station 3: INEOS Styrolution Sarnia Site is investigating potential sources of emissions affecting Stations 2 and 3.
4) Event 4, 5 & 7 Station 10, Event 6 Station 9: During the January tank refill at Styrene 1 it was discovered that a flange was a source of benzene emissions. Repairs were attempted and have been confirmed successful.
5) Event 6 Stations 11 & 12: Demolition of obsolete non-benzene containing storage tanks in close proximity to stations 11 and 12 was occurring during this time. INEOS Styrolution Sarnia Site is investigating potential sources of emissions.
6) Event 8, 9, 10, 17 & 19: INEOS Styrolution is investigating potential sources of emissions affecting Station 10.
7) Event 14, 15, 16, 20 & 24: INEOS Styrolution is investigating potential sources of emissions affecting Station 3.
8) Event 24: INEOS Styrolution is investigating potential sources of emissions affecting Station 9.

2019 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		25-Jun-19	9-Jul-19	23-Jul-19	6-Aug-19	20-Aug-19	3-Sep-19	17-Sep-19	1-Oct-19	15-Oct-19	29-Oct-19	12-Nov-19	26-Nov-19	10-Dec-19
Sample Retrieval Date		9-Jul-19	23-Jul-19	6-Aug-19	20-Aug-19	3-Sep-19	17-Sep-19	1-Oct-19	15-Oct-19	29-Oct-19	12-Nov-19	26-Nov-19	10-Dec-19	23-Dec-19
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
384557mE, 4755365mN	Station #1	5.04	3.48	3.40	3.06	2.01	3.68	2.83	2.32	3.79	4.28	3.84	3.47	3.82
384977mE, 4755264mN	Station #2	5.81	4.40	4.59	3.15	3.51	3.31	3.43	2.41	4.49	5.59	6.47	2.86	3.56
384802mE, 4754965mN	Station #3	36.30	29.30	32.00	27.10	18.60	20.50	36.10	16.30	19.50	28.70	30.50	16.70	28.50
384601mE, 4754820mN	Station #4	7.68	3.42	5.47	4.84	3.91	7.05	6.64	6.22	3.69	6.24	6.62	4.58	2.47
384425mE, 4754949mN	Station #5	3.70	2.92	3.04	3.97	5.07	6.06	4.24	5.30	3.18	4.82	8.91	4.90	2.67
384471mE, 4755177mN	Station #6	4.34	2.45	3.23	2.78	3.02	4.05	3.41	3.52	4.39	3.30	4.51	2.66	3.24
383689mE, 4755204mN	Station #7	6.36	7.01	10.60	9.07	3.20	6.28	6.21	3.74	3.82	3.00	7.51	3.92	5.69
383812mE, 4755079mN	Station #8	11.80	9.61	12.60	6.82	3.79	5.89	8.30	3.73	3.93	7.76	12.00	5.13	9.12
383796mE, 4754993mN	Station #9	19.40	14.70	18.70	9.44	5.78	9.06	13.30	5.92	8.09	14.30	45.30	8.85	14.50
383676mE, 4754870mN	Station #10	15.50	12.60	22.10	30.70	15.40	32.50	17.20	22.80	8.05	19.80	12.90	12.60	4.35
383547mE, 4754954mN	Station #11	5.14	2.65	3.29	6.13	13.50	14.50	8.71	19.10	7.81	1.76	15.40	9.76	6.86
383581mE, 4755077mN	Station #12	6.40	6.20	6.51	8.82	6.00	8.78	8.98	6.81	5.39	4.42	9.58	3.36	9.44

Field QA/QC Data

Field Blank #1	Location	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	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	<0.31
Field Duplicate	Location	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3
	Value (ug/m3)	36.60	3.48	2.97	2.71	2.11	3.28	34.80	6.52	3.06	3.29	3.83	2.60	27.70
	RPD (%)	0.83%	1.75%	2.30%	2.52%	4.98%	0.91%	3.60%	4.82%	3.77%	0.30%	0.26%	9.09%	2.81%
Field Blank #2	Location	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	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	<0.29	<0.34	<0.34	<0.31
Field Duplicate	Location	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9
	Value (ug/m3)	18.50	12.40	3.17	8.67	2.98	5.75	13.80	22.90	7.72	4.46	7.44	4.89	13.80
	RPD (%)	4.64%	1.59%	3.65%	1.70%	6.88%	2.38%	3.76%	0.44%	1.15%	0.90%	0.93%	4.68%	4.83%

2018 Benzene PLM Program

INEOS STYROLUTION

Sample Deployment Date		9-Jan-18	23-Jan-18	6-Feb-18	20-Feb-18	6-Mar-18	20-Mar-18	3-Apr-18	17-Apr-18	1-May-18	15-May-18	29-May-18	12-Jun-18	26-Jun-18
Sample Retrieval Date		23-Jan-18	6-Feb-18	20-Feb-18	6-Mar-18	20-Mar-18	3-Apr-18	17-Apr-18	1-May-18	15-May-18	29-May-18	12-Jun-18	26-Jun-18	10-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
384557mE, 4755365mN	Station #1	6.86	11.70	12.80	6.67	2.69	4.61	2.77	3.93	6.49	4.80	3.77	5.50	8.98
384977mE, 4755264mN	Station #2	10.40	9.51	5.16	6.45	3.57	2.25	2.54	4.44	5.05	6.76	2.98	5.04	4.89
384802mE, 4754965mN	Station #3	56.80	58.50	40.80	20.80	26.70	14.60	17.40	18.80	31.30	28.80	23.40	22.10	38.70
384601mE, 4754820mN	Station #4	6.97	8.57	8.11	13.20	6.02	11.00	9.89	13.60	6.83	11.00	15.90	15.40	6.37
384425mE, 4754949mN	Station #5	6.09	23.70	15.60	30.40	9.02	9.26	8.84	6.45	5.86	9.02	36.30	29.60	9.55
384471mE, 4755177mN	Station #6	8.38	8.54	19.90	5.92	3.76	6.00	3.87	5.15	3.65	5.23	8.86	7.94	9.13
383689mE, 4755204mN	Station #7	6.80	4.03	5.84	4.51	2.16	2.42	2.89	6.49	7.95	7.04	5.79	3.10	5.58
383812mE, 4755079mN	Station #8	13.50	11.80	9.51	6.36	4.81	2.50	4.26	7.14	10.80	11.30	4.96	3.16	2.77
383796mE, 4754993mN	Station #9	24.10	22.20	13.80	10.50	8.36	3.02	6.83	10.40	18.50	16.50	6.88	4.68	2.41
383676mE, 4754870mN	Station #10	6.16	11.10	12.40	26.70	18.70	37.90	28.10	7.84	17.40	16.60	>76.0	5.87	1.96
383547mE, 4754954mN	Station #11	10.90	2.50	6.84	7.15	5.65	9.29	6.04	7.85	3.49	7.23	34.70	3.58	2.54
383581mE, 4755077mN	Station #12	15.50	5.33	5.82	2.96	2.87	3.46	5.69	5.39	3.19	5.20	8.28	4.37	5.68

Field QA/QC Data

Field Blank #1	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	<0.32	<0.32	<0.32	<0.31	<0.32	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30	<0.30	<0.30
Field Duplicate	Location	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	6.64	9.46	39.40	12.20	8.80	6.29	2.67	4.03	30.50	10.70	35.70	7.83	9.24
	RPD (%)	3.21%	0.53%	3.43%	7.58%	2.44%	4.83%	3.61%	9.23%	2.56%	2.73%	1.65%	1.39%	2.90%
Field Blank #2	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	<0.32	<0.32	<0.32	<0.31	<0.32	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30	<0.30	<0.30
Field Duplicate	Location	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	6.91	10.70	13.50	27.80	5.72	3.46	3.12	7.33	17.90	12.30	34.50	4.36	5.46
	RPD (%)	1.62%	9.32%	2.17%	4.12%	1.24%	0.00%	7.96%	2.66%	3.24%	25.90%	0.58%	0.23%	2.15%

Notes:

1) RPD is Relative Percent Difference (Difference / Mean expressed as a percent). Used as the default precision evaluation.

2) On June 10, 2018 during the cleaning of a decommissioned benzene storage tank (to prepare tank for inspection), INEOS Styrolution Sarnia Site received grab sample analyses indicating increased levels of benzene at Styrene I (located on Vidal St). The Ministry of Environment and Climate Change (MOECC Spills Action Centre) was notified and subsequent updates were provided to the MOECC (SAC) from June 10, 2018 to June 15, 2018. The third party consultant continued taking grab samples twice daily and results indicated a decrease in benzene levels. The tank of concern is located on the Southeast corner of Styrene I, directly adjacent to Ambient Monitoring Station #10 and collected elevated sample results for the two-week period occurring May 29, 2018 – June 12, 2018.

On February 27, 2019, INEOS Styrolution was notified by the third party analytical laboratory that previous air concentration values (specifically, the data value for Station #10) was reported incorrectly. Due to a manual data entry error, the value for nanograms was erroneously entered for the value of the total concentration (i.e. ug/m3). The table has been updated to reflect the corrected data.

3) October 23, 2018 - Corrected UTM coordinates

2018 Benzene PLM Program

INEOS STYROLUTION

	Sample Deployment Date	10-Jul-18	24-Jul-18	7-Aug-18	21-Aug-18	4-Sep-18	18-Sep-18	2-Oct-18	16-Oct-18	30-Oct-18	13-Nov-18	26-Nov-18	10-Dec-18
	Sample Retrieval Date	24-Jul-18	7-Aug-18	21-Aug-18	4-Sep-18	18-Sep-18	2-Oct-18	16-Oct-18	30-Oct-18	13-Nov-18	26-Nov-18	10-Dec-18	24-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
384557mE, 4755365mN	Station #1	6.77	4.79	3.87	5.41	3.55	2.65	3.46	1.91	3.20	2.59	2.25	5.69
384977mE, 4755264mN	Station #2	4.01	3.76	3.79	5.19	2.97	2.03	2.84	6.63	3.54	3.43	4.57	3.91
384802mE, 4754965mN	Station #3	25.80	30.50	15.20	37.70	10.10	13.70	17.00	23.90	12.90	13.70	14.00	23.80
384601mE, 4754820mN	Station #4	9.59	2.73	7.19	2.82	10.50	6.09	1.98	3.70	4.55	3.61	3.84	3.56
384425mE, 4754949mN	Station #5	12.30	3.32	6.55	4.51	16.60	5.41	2.15	3.72	4.07	3.63	2.43	3.34
384471mE, 4755177mN	Station #6	11.40	3.77	6.67	6.23	5.07	3.33	4.65	1.27	3.03	3.91	2.56	5.86
383689mE, 4755204mN	Station #7	4.19	4.97	2.62	4.97	2.88	2.97	3.09	2.23	1.45	0.97	0.99	2.11
383812mE, 4755079mN	Station #8	2.61	2.76	3.24	3.21	1.86	1.75	1.65	2.07	1.47	0.96	1.06	1.73
383796mE, 4754993mN	Station #9	2.83	2.60	2.25	2.03	2.02	1.66	1.44	1.56	1.70	1.45	1.27	1.82
383676mE, 4754870mN	Station #10	2.27	1.44	2.30	1.49	2.69	1.72	1.02	0.89	1.13	0.96	0.95	1.58
383547mE, 4754954mN	Station #11	2.74	1.54	1.78	1.91	3.60	2.79	1.52	1.11	1.71	1.34	1.73	2.23
383581mE, 4755077mN	Station #12	3.14	2.74	3.44	2.76	6.14	3.69	1.33	2.28	1.55	1.29	1.04	5.01

Field QA/QC Data

Field Blank #1	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.34	<0.31	<0.31
Field Duplicate	Location	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #1
	Value (ug/m3)	4.00	29.50	7.67	4.36	4.89	2.38	2.75	23.30	4.48	3.56	2.49	5.48
	RPD (%)	0.25%	3.28%	6.68%	3.33%	3.55%	10.19%	3.17%	2.51%	1.54%	1.93%	2.73%	3.69%
Field Blank #2	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.31	<0.31	<0.31	<0.31	<0.34	<0.31	<0.31
Field Duplicate	Location	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12	Station #7
	Value (ug/m3)	2.78	2.63	2.27	1.96	6.18	2.95	1.16	1.52	1.20	1.26	1.01	2.22
	RPD (%)	6.51%	1.15%	1.30%	2.62%	0.65%	0.67%	29.70%	2.56%	6.19%	5.97%	2.88%	5.21%

APPENDIX D
Annual Average Data

INEOS Styrolution Canada Ltd.
PCIS PLM Annual Average Benzene Concentrations

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	5.11	4.63	25.48	7.72	10.71	6.16	3.92	4.69	6.83	11.41	5.27	4.33
2019	3.85	6.49	25.43	6.56	5.40	4.41	5.48	8.82	15.38	24.53	9.31	7.64
2020	3.33	4.45	26.82	4.84	4.00	3.56	4.23	7.24	11.17	14.09	7.96	5.18
2021	2.75	3.84	29.15	4.28	3.51	2.84	3.34	4.30	7.36	11.86	4.68	5.15
2022	4.23	4.88	34.79	5.75	6.63	6.42	3.64	4.13	8.98	10.08	4.23	3.53
2023	4.23	4.90	23.75	7.67	6.68	5.06	2.97	4.03	10.46	9.96	4.77	3.53
2024	3.17	3.44	13.25	3.51	5.22	4.48	2.73	3.13	6.95	7.84	4.39	3.34

APPENDIX E
3 Year Statistical Baseline

INEOS Styrolution Canada Ltd.
PCIS PLM Baseline Determination of 2021-2023RY

			Station #1	Station #2	Station #3	Station #4	Station #5	Station #6	Station #7	Station #8	Station #9	Station #10	Station #11	Station #12
Baseline	**Mean of natural log of station concentrations**	**Mean, X**	1.1739	1.4254	3.2463	1.4938	1.3971	1.2850	1.2200	1.5163	2.0065	2.1848	1.5158	1.3686
	Number of samples	**m**	74	74	73	73	73	73	74	72	74	74	74	73
	Square of standard deviations of natural log of station concentrations	**S^2**	0.1157	0.1110	0.2929	0.2342	0.2906	0.2799	0.1891	0.2404	0.3380	0.7482	0.3589	0.2590

Notes:
All calculations are based upon section 61(2) of the PCIS

APPENDIX F
Statistical Analysis of Ambient Benzene Measurements

Summary of calculated statistics, and comparison of values to the test statistic table for the 2024 analysis year

Data Period	Statistic	Symbol in Equations	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12
Baseline	Mean of natural log of station concentrations	X	1.2445	1.4590	3.1765	1.5748	1.5354	1.3861	1.1162	1.3444	1.9313	2.1231	1.3946	1.2510
	Number of samples	m	77	77	77	77	77	77	77	76	77	77	77	77
	Square of standard deviations of natural log of station concentrations	S1^2	0.1459	0.1146	0.3566	0.3291	0.3550	0.3066	0.1591	0.1573	0.3748	0.6041	0.2582	0.2353
Analysis Year	Mean of natural log of station concentrations	Y	0.9998	0.9211	1.9591	0.9804	1.2720	1.2828	0.8946	0.9990	1.6234	1.6040	1.1704	1.0399
	Number of samples	n	27	27	27	27	27	27	27	27	27	27	27	27
	Square of standard deviations of natural log of station concentrations	S2^2	0.3282	0.4598	1.0458	0.5375	0.6930	0.4522	0.2689	0.3478	0.6635	1.1890	0.6757	0.3942
	Calculation Test Statistic	T_calc	-2.06	-3.95	-5.85	-3.82	-1.51	-0.72	-2.02	-2.82	-1.79	-2.28	-1.33	-1.59
	Degrees of freedom	v	34.45	30.66	32.43	37.77	35.79	39.07	37.36	34.71	36.83	35.70	33.23	37.46
	Rounded value for v		34	31	32	38	36	39	37	35	37	36	33	37
Look up in Statistical analysis table														
	Test Statistic for Statistical Significance	T_Table	3.551	3.551	3.551	3.551	3.551	3.551	3.551	3.551	3.551	3.551	3.551	3.551
Is the change statistically significant - If T_calc>T_table, then increase in benzene concentration in analysis year is statistically significant														
			Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant

Notes:
All calculations are based on the natural logarithm of the raw data, as per the instructions in the tech standard.

Calculations

S1^2 $S^2 = [_1 \sum (x_r - X)^2] / (n-1)$

T_calc $T = (Y - X) / \sqrt{(S_1^2/m + S_2^2/n)}$

v $(v) = [(S_1^2/m + S_2^2/n)^2]/[(S_1^2/m)^2/(m-1) + (S_2^2/n)^2/(n-1)]$

Reporting Tables as required under Chapter 6, section 65, Subsection 6, sub-sub-sections ii.B and ii.C.

Monitoring Station	Analysis Year - 2024RY		Test Statistic, T_Calc	Degrees of Freedom, v	Was there a statistically significant increase in station benzene concentrations in the analysis year?
	Mean of natural logarithms of concentrations Y	Square of Standard Deviation of natural logarithms, S2^2			
Station 1	1.00	0.33	-2.06	34.45	No
Station 2	0.92	0.46	-3.95	30.66	No
Station 3	1.96	1.05	-5.85	32.43	No
Station 4	0.98	0.54	-3.82	37.77	No
Station 5	1.27	0.69	-1.51	35.79	No
Station 6	1.28	0.45	-0.72	39.07	No
Station 7	0.89	0.27	-2.02	37.36	No
Station 8	1.00	0.35	-2.82	34.71	No
Station 9	1.62	0.66	-1.79	36.83	No
Station 10	1.60	1.19	-2.28	35.70	No
Station 11	1.17	0.68	-1.33	33.23	No
Station 12	1.04	0.39	-1.59	37.46	No

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	5.11	4.63	25.48	7.72	10.71	6.16	3.92	4.69	6.83	11.41	5.27	4.33
2019	3.85	6.49	25.43	6.56	5.40	4.41	5.48	8.82	15.38	24.53	9.31	7.64
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2024	3.17	3.44	13.25	3.51	5.22	4.48	2.73	3.13	6.95	7.84	4.39	3.34