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March 14, 2024

Illinois Environmental Protection Agency  
Bureau of Air  
Air Quality Planning Section (#39)  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

Attn: Annual Emission Report

**Re: Annual Emissions Report, Reporting Year 2023  
Shell Oil Products US  
Roxana Source, I.D. No. 119090AAO**

To Whom It May Concern:

AECOM Technical Services, Inc. (AECOM), on behalf of Shell Oil Products US, is submitting the enclosed Annual Emissions Report for activities at the Roxana Site. If you have any questions or need any additional information, please contact Wendy Pennington (314-452-8929) or via email at [wendy.pennington@aecom.com](mailto:wendy.pennington@aecom.com).

Sincerely,  
AECOM

Wendy Pennington, PE  
Project Manager

Enclosures: Annual Emission Report, Reporting Year 2023

cc: Mr. Leroy Bealer, Shell Oil Products US  
Project File

**119090AAO - Shell Oil Products US**

**- SOURCE DATA -**

AIRS:	17-119-0044	IEPA USE ONLY	SIC 1:	4613	NAICS 1:	486910
FINDS:		IEPA USE ONLY	SIC 2:		NAICS 2:	
SOURCE FEIN:	522074528		SIC 3:		NAICS 3:	
IDS AND D&B:			SIC 4:		NAICS 4:	
LOCATION LATITUDE:	38:50:42.3168		SIC 5:		NAICS 5:	
LONGITUDE:	90:04:34.0752		SIC 6:		NAICS 6:	

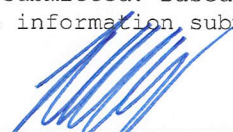
SOURCE ADDRESS	Shell Oil Products US (SOPUS) Chaffer St. and 8th St. Roxana, IL 62084	CONTACT: <del>Robert Meechegian</del> Leroy Bealer PHONE: 314-429-0100 484-632-7955 Fax: E-mail: leroy.bealer@shell.com
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ANNUAL EMISSION REPORT MAILING ADDRESS	AECOM 100 N. Broadway 20th Fl St. Louis, MO 63102	CONTACT: Samuel Fisher PHONE: 314-296-1969 FAX: E-Mail: samuel.fisher@aecom.com
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Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44 (h))

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.

 _____ AUTHORIZED SIGNATURE	_____ DATE
Leroy Bealer, Senior Program Manager _____ TYPED OR PRINTED NAME AND TITLE	484-632-7955 _____ TELEPHONE NUMBER

The Illinois EPA is authorized to require, and you must disclose, the information on this form pursuant to 35 Ill. Adm. Code 201.302 (a,b) and 254. It is not necessary to use this form in providing the information. Failure to disclose the information may result in penalties as provided for in the Environmental Protection Act, 415 ILCS 5/24-45.

119090AAO - Shell Oil Products US

- ANNUAL SOURCE EMISSIONS -

POLLUTANT CODE	SOURCE REPORTED EMISSIONS FOR 2023 (TONS/YEAR)	EMISSIONS REPORTED FOR 2022 (TONS/YEAR)	IEPA 2023 ESTIMATED EMISSIONS (TONS/YEAR)
CO	0.339320	0.299434	0.421949
CO <sub>2</sub>	475.236955	419.375071	602.784000
Methane	0.009109	0.008039	0.011553
N <sub>2</sub> O	0.008713	0.007689	0.011051
NH <sub>3</sub>	0.012673	0.011184	0.016074
NO <sub>x</sub>	0.403952	0.356469	0.502320
Part	0.030701	0.027092	0.038176
PM <sub>10</sub>	0.030701	0.027092	0.038176
PM <sub>2.5</sub>	0.030701	0.027092	0.038176
SO <sub>2</sub>	0.002424	0.002139	0.003014
VOM	1.202523	1.101299	1.499812

119090AAO - Shell Oil Products US

- PERMIT LISTING -

PERMIT NUMBER	TYPE OF PERMIT	OPERATION NAME	STATUS	STATUS DATE	EXPIRES
12040025	FESOP	Treatment of Contaminated Soil Vapor	GRANTED	05-03-2022	10-05-2031
22020023	CONSTRUCTION	Steam Enhanced Extraction System (SEE)	GRANTED	05-03-2022	

119090AAO - Shell Oil Products US

- FUEL COMBUSTION DATA -

POINT 0003 - Natural gas combustion of RTO/SVE/SEE  
 BEGAN OPERATION: 01/2012 \_\_\_\_\_  
 CEASED OPERATION: / \_\_\_\_\_  
 MODE 01 - Natural gas combustion

PERMIT: 12040025

SCC: 40290013

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: ~~25.00 %~~ 25.87 % MAR - MAY: ~~25.00 %~~ 24.04 %  
 BEGAN OPERATION: ~~06/2011~~ 01/2012 JUN - AUG: ~~25.00 %~~ 24.34 % SEP - NOV: ~~25.00 %~~ 25.75 %  
 CEASED OPERATION: \_\_\_\_\_

FUEL TYPE: 1 NATURAL GAS HEAT CONTENT: Natural Gas 1,000 Btu/ft3  
 INPUT (MMBTU/HR): ~~28.1~~ 3 \_\_\_\_\_  
 SULFUR CONTENT (%): \_\_\_\_\_  
 ASH CONTENT (%): \_\_\_\_\_  
 NITROGEN CONTENT (%): \_\_\_\_\_

UNITS: ~~MILLION CUBIC FEET BURNED~~ MILLION BTU BURNED

UNITS: ~~MILLION CUBIC FEET BURNED~~ MILLION BTU BURNED

ANNUAL OPERATION			PEAK OZONE SEASON OPERATION		
HOURS/DAY:	24.0	<u>24.0</u>	HOURS/DAY:	24.0	<u>24.0</u>
DAYS/WEEK:	7.0	<u>7.0</u>	DAYS/WEEK:	7.0	<u>7.0</u>
WEEKS/YEAR:	<del>49</del>	<u>50</u>	WEEKS/YEAR:	<del>12</del>	<u>13</u>
HOURS/YEAR:	<del>8,252</del>	<u>8,406</u>	HOURS/YEAR:	<del>1,969</del>	<u>2,113</u>
			START TIME:		<u>00:00</u>
			END TIME:		<u>23:59</u>
RATE/HR:	<del>0.2400</del>	<u>0.21</u>	RATE/HR:	<del>0.2700</del>	<u>0.21</u>

**119090AAO - Shell Oil Products US**

**- FUEL COMBUSTION DATA -**

POINT 0003 - Natural gas combustion of RTO/SVE/SEE PERMIT: 12040025

BEGAN OPERATION: 01/2012 \_\_\_\_\_

CEASED OPERATION: / \_\_\_\_\_

SCC: 40290013

MODE 01 - Natural Gas Combustion

POLLUTANT CODE	METHOD		EMISSION FACTOR		EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
CO	3	3	84	84 lbs/10 <sup>6</sup> scf	<del>0.1092</del>	0.0180
CO <sub>2</sub>	3	3	120,000	120000 lbs/10 <sup>6</sup> scf	<del>156</del>	25.1633
Methane	3	3	2.3	2.3 lbs/10 <sup>6</sup> scf	<del>0.00299</del>	0.0005
N <sub>2</sub> O	3	3	2.2	2.2 lbs/10 <sup>6</sup> scf	<del>0.00286</del>	0.0005
NH <sub>3</sub>	3	3	3.2	3.2 lbs/10 <sup>6</sup> scf	<del>0.00416</del>	0.0007
NO <sub>x</sub>	3	3	100	100 lbs/10 <sup>6</sup> scf	<del>0.13</del>	0.0214
PART	3	3	7.6	7.6 lbs/10 <sup>6</sup> scf	<del>0.00988</del>	0.0016
PM <sub>10</sub>	3	3	7.6	7.6 lbs/10 <sup>6</sup> scf	<del>0.00988</del>	0.0016
PM <sub>2.5</sub>	3	3	7.6	7.6 lbs/10 <sup>6</sup> scf	<del>0.00988</del>	0.0016
SO <sub>2</sub>	3	3	0.6	0.6 lb/10 <sup>6</sup> scf	<del>0.00078</del>	0.0001
VOM*	<del>3</del>	NA	<del>5.5</del>	NA lbs/10 <sup>6</sup> scf	<del>0.00715</del>	NA

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
NO <sub>x</sub>	3	3	100	100 lbs/10 <sup>6</sup> scf	<del>0.13</del>	0.0207
VOM*	<del>3</del>	NA		NA lbs/10 <sup>6</sup> scf	<del>0</del>	NA

CAPTURING CONTROLS:

CAPTURING STACKS:

STACK 0003 CAPTURE EFFICIENCY: 100.00 % 100.00 %

\*VOM emissions from combustion are accounted for in the SVE emissions on page 9.

**119090AAO - Shell Oil Products US**

**- FUEL COMBUSTION DATA -**

POINT 0003 - Soil vapor combustion of RTO/SVE/SEE PERMIT: 12040025  
 BEGAN OPERATION: / 01/2012  
 CEASED OPERATION: / \_\_\_\_\_  
 MODE 02 - Soil Vapor Combustion SCC: 40290013

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: 26.60 % MAR - MAY: 28.04 %  
 BEGAN OPERATION: / 01/2012 JUN - AUG: 23.67 % SEP - NOV: 21.68 %  
 CEASED OPERATION: / \_\_\_\_\_

FUEL TYPE: 9 OTHER GASEOUS FUEL-SOIL VAPORS HEAT CONTENT: Soil Vapors 21,070 Btu/lb  
 INPUT (MMBTU/HR): \_\_\_\_\_ SULFUR CONTENT (%): \_\_\_\_\_  
 ASH CONTENT (%): \_\_\_\_\_  
 NITROGEN CONTENT (%): \_\_\_\_\_

UNITS: MILLION BTU BURNED

UNITS: MILLION BTU BURNED

ANNUAL OPERATION		PEAK OZONE SEASON OPERATION	
HOURS/DAY:	<u>24.0</u>	HOURS/DAY:	<u>24.0</u>
DAYS/WEEK:	<u>7.0</u>	DAYS/WEEK:	<u>7.0</u>
WEEKS/YEAR:	<u>50</u>	WEEKS/YEAR:	<u>13</u>
HOURS/YEAR:	<u>8,406</u>	HOURS/YEAR:	<u>2,113</u>
		START TIME:	<u>00:00</u>
		END TIME:	<u>23:59</u>
RATE/HR:	<u>0.75</u>	RATE/HR:	<u>0.70</u>

**119090AAO - Shell Oil Products US**

**- FUEL COMBUSTION DATA -**

POINT 0003 - Soil vapor combustion of RTO/SVE/SEE PERMIT: 12040025

BEGAN OPERATION: / 01/2012

CEASED OPERATION: / \_\_\_\_\_

SCC: 40290013

MODE 02 - Soil Vapor Combustion

POLLUTANT CODE	METHOD		EMISSION FACTOR		EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
CO		3		84 lbs/10 <sup>6</sup> scf		0.0628
CO <sub>2</sub>		3		120,000 lbs/10 <sup>6</sup> scf		87.9143
Methane		3		2.3 lbs/10 <sup>6</sup> scf		0.0017
N <sub>2</sub> O		3		2.2 lbs/10 <sup>6</sup> scf		0.0016
NH <sub>3</sub>		3		3.2 lbs/10 <sup>6</sup> scf		0.0023
NO <sub>x</sub>		3		100 lbs/10 <sup>6</sup> scf		0.0747
PM		3		7.6 lbs/10 <sup>6</sup> scf		0.0057
PM <sub>10</sub>		3		7.6 lbs/10 <sup>6</sup> scf		0.0057
PM <sub>2.5</sub>		3		7.6 lbs/10 <sup>6</sup> scf		0.0057
SO <sub>2</sub>		3		0.6 lb/10 <sup>6</sup> scf		0.0004
VOM*		NA		NA lbs/10 <sup>6</sup> scf		NA

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
NO <sub>x</sub>		3		100 lbs/10 <sup>6</sup> scf		0.07

CAPTURING CONTROLS:

CAPTURING STACKS:

STACK 0003 CAPTURE EFFICIENCY: 100.00 %

\*VOM emissions from combustion are accounted for in the SVE emissions on page 9.



**119090AAO - Shell Oil Products US**

**- OTHER SOURCE DATA -**

POINT 001 - Soil vapor extraction system (SVE) and steam enhanced extraction system (SEE) system with RTO control PERMIT: 12040025  
 BEGAN OPERATION: ~~05/2011~~ 01/2012  
 CEASED OPERATION: /                      SCC: 50410310  
 MODE: 01 -

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: ~~25.00%~~ 25.06 % MAR - MAY: ~~25.00%~~ 25.89 %  
 BEGAN OPERATION: ~~12/2010~~ 01/2012 JUN - AUG: ~~25.00%~~ 25.14 % SEP - NOV: ~~25.00%~~ 23.91 %  
 CEASED OPERATION: /                     

UNITS: ~~SCFM~~ HOURS OPERATED

UNITS: ~~SCFM~~ HOURS OPERATED

ANNUAL OPERATION			PEAK OZONE SEASON OPERATION		
HOURS/DAY:	24.0	<u>24.0</u>	HOURS/DAY:	24.0	<u>24.0</u>
DAYS/WEEK:	7.0	<u>7.0</u>	DAYS/WEEK:	7.0	<u>7.0</u>
WEEKS/YEAR:	49	<u>50</u>	WEEKS/YEAR:	12	<u>13</u>
HOURS/YEAR:	<del>8,252</del>	<u>8,406</u>	HOURS/YEAR:	<del>1,969</del>	<u>2,113</u>
			START TIME:	<u>00:00</u>	
			END TIME:	<u>23:59</u>	
RATE/HR:	<del>0.0000</del>	<u>NA*</u>	RATE/HR:	<del>0.0000</del>	<u>NA*</u>

\*The rate/hr is not applicable because emissions are estimated using a measured emissions rate (lb/hr) and the system operating hours.

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- OTHER SOURCE DATA -

POINT 001 - Soil vapor extraction system (SVE) and steam enhanced extraction system (SEE) system with RTO control PERMIT: 12040025

BEGAN OPERATION: ~~05/2011~~ 01/2012  
 CEASED OPERATION: \_\_\_\_\_

SCC: 50410310

MODE: 01 -

POLLUTANT CODE	METHOD		EMISSION FACTOR		EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
VOM	2	1		NA*	<del>0.380999</del>	0.29

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
VOM	2	1		NA*	<del>0.380999</del>	0.35

CAPTURING CONTROLS:

CONTROL 0001 CAPTURE EFFICIENCY: 100.00 % 100.00 %

CAPTURING STACKS:

STACK 0003

\*The rate/hr is not applicable because emissions are estimated using a measured emissions rate (lb/hr) and the system operating hours.

**119090AAO - Shell Oil Products US**

**- CONTROL DEVICE DATA -**

CONTROL 0001 - Regenerative Thermal Oxidizer (RTO)

PERMIT: 12040025

BEGAN OPERATION: ~~06/2011~~ 01/2012  
 CEASED OPERATION: /                     

CONTROL CODE: 319

DESCRIPTION CORRECTION:

REMOVAL EFFICIENCY

POLLUTANT	ANNUAL OPERATION				PEAK OZONE SEASON OPERATION			
	EFFICIENCY		METHOD		EFFICIENCY		METHOD	
	IEPA	REPORTED	IEPA	REPORTED	IEPA	REPORTED	IEPA	REPORTED
VOM	<del>97.00 %</del>	<u>99.3%*</u>		<u>1</u>	99.3%			<u>1</u>

CAPTURING CONTROLS:

CAPTURING STACKS:

STACK	0001**	(SVE)	CAPTURE EFFICIENCY:	<del>33.34 %</del>	<u>100.00 %</u>
STACK	0003	(RTO)	CAPTURE EFFICIENCY:	<del>33.33 %</del>	<u>100.00 %</u>
STACK	0004	(SEE)	CAPTURE EFFICIENCY:	<del>33.33 %</del>	<u>100.00 %</u>

\*The RTO was tested for VOM destruction efficiency on June 25 and June 26, 2013.

\*\*100% of SVE system vapor stream (Point 0001) is piped directly into RTO (Control 0001; Stack 0003).  
 SVE system does not have its own stack distinct from RTO stack.

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- STACK DATA -

<u>STACK</u>	<u>DIAMETER (FT)</u>	<u>HEIGHT (FT)</u>	<u>FLOW RATE (ACFM)</u>	<u>TEMPERATURE (°F)</u>
0001* - Soil vapor extraction (SVE) system stack	<del>0.74</del> _____	<del>18</del> _____	<del>1,020</del> _____	<del>104</del> _____
0003 - Regenerative Thermal Oxidizer (RTO)	2.50 <u>2.5</u>	<del>19</del> <u>18.5</u>	10,000 <u>10,000</u>	200 <u>200</u>
0004 - Steam Enhanced Extraction (SEE) System	2.00 <u>2.00</u>	<del>12</del> <u>13</u>	7,000 <u>7,000</u>	400 <u>400</u>

\*100% of SVE system vapor stream (Point 0001) is piped directly into RTO (Control 0001; Stack 0003).  
 SVE system does not have its own stack distinct from RTO stack.