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April 4, 2017

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 Emission Report, Reporting Year 2016
Shell Oil Products US
Roxana Site, I.D. No. 119090AAO**

To whom it may concern:

AECOM, on behalf of Shell Oil Products US, is submitting the enclosed Annual Emission Report for activities at the Roxana Site. If you have any questions or need any additional information, please contact Robert E. Mooshegian at (314) 429-0100 or via email at robert.mooshegian@aecom.com.

Sincerely,
AECOM

Joshua Clark
Environmental Scientist

Robert E. Mooshegian, CHMM
Senior Program Manager

Enclosures: Annual Emissions Report, Reporting Year 2016

cc:
Mr. Kevin E. Dyer, Shell Oil Products US

119090AAO - Shell Oil Products US

- SOURCE DATA -


SOURCE IDS AND LOCATION	AIRS:	17-119-00440	IEPA USE ONLY	SIC 1:	4613	NAICS 1:	486910
	FINDS:		IEPA USE ONLY	SIC 2:		NAICS 2:	
	FEIN:	522074528		SIC 3:		NAICS 3:	
	D&B:			SIC 4:		NAICS 4:	
	LATITUDE:	38:50:42.3168		SIC 5:		NAICS 5:	
	LONGITUDE:	90:04:34.0752		SIC 6:		NAICS 6:	

SOURCE ADDRESS	Shell Oil Products US	CONTACT: Kevin E. Dyer
	Chaffer St. and 8th St. Roxana, IL 62084	PHONE: (618) 288-7237 EXT:

ANNUAL EMISSION REPORT MAILING ADDRESS	Shell Oil Products US	CONTACT: Kevin E. Dyer
	17 Junction Dr. PMB 399 Glen Carbon, IL 62034-43000	PHONE: (618) 288-7237 FAX: E-Mail: kevin.dyer@shell.com

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.

	<u>3/29/17</u>
AUTHORIZED SIGNATURE	DATE
<u>Kevin E. Dyer, Sr. Principal Program Manager</u>	<u>(618) 288-7237</u>
TYPED OR PRINTED NAME AND TITLE	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.

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- ANNUAL SOURCE EMISSIONS -

POLLUTANT CODE	SOURCE REPORTED	EMISSIONS	IEPA 2016
	EMISSIONS	EMISSIONS	ESTIMATED
	FOR 2016	REPORTED FOR 2015	EMISSIONS
	(TONS/YEAR)	(TONS/YEAR)	(TONS/YEAR)
CO	0.668759	1.380502	0.421949
CO ₂	955.369339	1972.145506	602.784000
Methane	0.018311	0.037799	0.011553
N ₂ O	0.017515	0.036156	0.011051
NH ₃	0.025477	0.052591	0.016074
NO _x	0.796141	1.643455	0.502320
Part	0.060507	0.124903	0.038176
PM ₁₀	0.060507	0.124903	0.038176
PM _{2.5}	0.060507	0.124903	0.038176
SO ₂	0.004777	0.009861	0.003014
VOM	4.258340	2.236080	11.503708

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- PERMIT LISTING -

PERMIT NUMBER	TYPE OF PERMIT	OPERATION NAME	STATUS	STATUS DATE	EXPIRES
10120040	CONSTRUCTION	Soil Vapor Extraction Treatment System	GRANTED	03-01-2011	04-01-2012
11050032	CONSTRUCTION	Soil Vapor Extraction Treatment System w/Dual ICE	GRANTED	05-31-2011	05-31-2012
11060036	LIFETIME	SVE Treatment System	GRANTED	07-14-2011	07-14-2012
12040025 *	TITLE V	Treatment of Contaminated Soil Vapor			

* A renewal application was submitted to IEPA in April 2012.

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- FUEL COMBUSTION DATA -

POINT 0003 - Regenerative Thermal Oxidizer PERMIT: 11060036
 BEGAN OPERATION: 01/2012 _____
 CEASED OPERATION: / _____
 MODE 01 - Natural gas combustion SCC: 40290013

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: 32.35 % 38.82 % MAR - MAY: 23.43 % 21.69 %
 BEGAN OPERATION: ~~06/2011~~ 01/2012 JUN - AUG: 30.74 % 16.49 % SEP - NOV: 13.48 % 23.00 %
 CEASED OPERATION: _____

FUEL TYPE: 1 NATURAL GAS HEAT CONTENT: Natural Gas 1,000 Btu/ft3
 INPUT (MMBTU/HR): 1.4 _____
 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:	50	<u>45</u>	WEEKS/YEAR:	12	<u>12</u>
HOURS/YEAR:	8,318	<u>7,611</u>	HOURS/YEAR:	2,066	<u>1,971</u>
			START TIME:		<u>00:00</u>
			END TIME:		<u>23:59</u>
RATE/HR:	0.0002	<u>0.27</u>	RATE/HR:	0.0002	<u>0.17</u>

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- FUEL COMBUSTION DATA -

POINT 0003 - Regenerative Thermal Oxidizer PERMIT: 11060036
 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 ⁶ scf	0.1092	0.0226
CO ₂	3	3	120,000	120000 lbs/10 ⁶ scf	156	32.3170
Methane	3	3	2.3	2.3 lbs/10 ⁶ scf	0.00299	0.0006
N ₂ O	3	3	2.2	2.2 lbs/10 ⁶ scf	0.00286	0.0006
NH ₃	3	3	3.2	3.2 lbs/10 ⁶ scf	0.00416	0.0009
NO _x	3	3	100	100 lbs/10 ⁶ scf	0.13	0.0269
PM	3	3	7.6	7.6 lbs/10 ⁶ scf	0.00988	0.0020
PM ₁₀	3	3	7.6	7.6 lbs/10 ⁶ scf	0.00988	0.0020
PM _{2.5}	3	3	7.6	7.6 lbs/10 ⁶ scf	0.00988	0.0020
SO ₂	3	3	0.6	0.6 lb/10 ⁶ scf	0.00078	0.0002
VOM*	3	NA	5.5	NA lbs/10 ⁶ scf	0.00715	NA

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
NO _x	3	3	100	100 lbs/10 ⁶ scf	0.4288	0.0172
VOM*	3	NA		NA lbs/10 ⁶ scf	0	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.

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- FUEL COMBUSTION DATA -

POINT 0003 - Regenerative Thermal Oxidizer PERMIT: 11060036
 BEGAN OPERATION: / 01/2012
 CEASED OPERATION: / _____
 MODE 02 - Soil Vapor Combustion SCC: 40290013

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: 29.25 % MAR - MAY: 31.74 %
 BEGAN OPERATION: / 01/2012 JUN - AUG: 25.34 % SEP - NOV: 13.67 %
 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>45</u>	WEEKS/YEAR:	<u>12</u>
HOURS/YEAR:	<u>7,611</u>	HOURS/YEAR:	<u>1,971</u>
		START TIME:	<u>00:00</u>
		END TIME:	<u>23:59</u>
RATE/HR:	<u>1.86</u>	RATE/HR:	<u>1.82</u>

119090AAO - Shell Oil Products US

- FUEL COMBUSTION DATA -

POINT 0003 - Regenerative Thermal Oxidizer PERMIT: 11060036
 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 ⁶ scf		0.15
CO ₂		3		120,000 lbs/10 ⁶ scf		218.73
Methane		3		2.3 lbs/10 ⁶ scf		0.00
N ₂ O		3		2.2 lbs/10 ⁶ scf		0.00
NH ₃		3		3.2 lbs/10 ⁶ scf		0.01
NO _x		3		100 lbs/10 ⁶ scf		0.18
PM		3		7.6 lbs/10 ⁶ scf		0.01
PM ₁₀		3		7.6 lbs/10 ⁶ scf		0.01
PM _{2.5}		3		7.6 lbs/10 ⁶ scf		0.01
SO ₂		3		0.6 lb/10 ⁶ scf		0.00
VOM*		NA		NA lbs/10 ⁶ scf		NA

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
NO _x		3		100 lbs/10 ⁶ scf		0.18

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 PERMIT: 11060036
 BEGAN OPERATION: ~~12/2010~~ 05/2011
 CEASED OPERATION: /
 MODE: 01 - SCC: 50410310

DESCRIPTION CORRECTION:

PERCENT THROUGHPUTS: DEC - FEB: ~~24.87 %~~ 24.20 % MAR - MAY: ~~25.49 %~~ 26.16 %
 BEGAN OPERATION: ~~12/2010~~ 05/2011 JUN - AUG: ~~24.84 %~~ 25.90 % SEP - NOV: ~~24.80 %~~ 23.74 %
 CEASED OPERATION: /

UNITS: ~~TONS PROCESSED~~ HOURS OPERATED UNITS: ~~TONS PROCESSED~~ 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:	50	<u>45</u>	WEEKS/YEAR:	12	<u>12</u>
HOURS/YEAR:	8,318	<u>7,611</u>	HOURS/YEAR:	2,066	<u>1,971</u>
			START TIME:		<u>00:00</u>
			END TIME:		<u>23:59</u>
RATE/HR:	8318.0000	<u>NA*</u>	RATE/HR:	2066.0000	<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 PERMIT: 11060036
 BEGAN OPERATION: ~~12/2010~~ 05/2011
 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*	2.97	0.54

POLLUTANT CODE	METHOD		EMISSION FACTOR		OZONE SEASON EMISSION RATE (LB/HR)	
	IEPA	REP	IEPA	REPORTED	IEPA	REPORTED
VOM	1	1		NA*	0.78	0.78

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.

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- CONTROL DEVICE DATA -

CONTROL 0001 - Regenerative Thermal Oxidizer PERMIT: 11060036
 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	97.00 %	<u>99.3%*</u>		<u>1</u>	99.3%			<u>1</u>

CAPTURING CONTROLS:

CAPTURING STACKS:
 STACK ~~0001~~ 0003 CAPTURE EFFICIENCY: 100.00 % 100.00 %

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

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- STACK DATA -

STACK	DIAMETER (FT)		HEIGHT (FT)		FLOW RATE (ACFM)		TEMPERATURE (°F)	
	IEPA	REPORTED	IEPA	REPORTED	IEPA	REPORTED	IEPA	REPORTED
0001	- Soil vapor extraction system*							
	0.74	NA	18	NA	1,020	NA	104	NA
0003	- Regenerative Thermal Oxidizer							
	1.83	2.5	30	18.5	10,000	10,000	200	200

*The soil vapor extraction system (POINT 001) exhausts through STACK 0003.