AECOM
100 N. Broadway
20th Floor
St. Louis, MO 63102
aecom.com

February 21, 2022

Ms. Jocelyn Stakely
Environmental Protection Engineer
Illinois Environmental Protection Agency
Bureau of Air, Permit Section
1021 North Grand Avenue East
Springfield, IL 62794

Subject: **Application for Construction and Operating Permit - Steam Enhanced Extraction (SEE) System With Existing Regenerative Thermal Oxidizer (RTO)**

FESOP No. 12040025 – Madison County
Equilon Enterprises LLC d/b/a/ Shell Oil Products US
Roxana Source I.D. No. 119090AAO

Dear Ms. Stakely,

On behalf of Equilon Enterprises LLC, d/b/a Shell Oil Products US (SOPUS), AECOM Technical Services, Inc. (AECOM) is submitting this construction application package. Source I.D. 119090AAO is currently covered by FESOP 12040025. The proposed steam enhanced extraction (SEE) system will tie into the existing regenerative thermal oxidizer (RTO). The existing RTO will not be modified. Construction of the SEE system will result in one new emission unit, a steam boiler.

AECOM respectfully requests that FESOP 12040025 be modified to incorporate the addition of the SEE system. A copy of the FESOP with requested modifications is included as an attachment to this application package. Also enclosed is the check for $4000.00, which covers the fee for a new emissions unit added to an existing synthetic minor source. We appreciate your earliest possible review for this application. If you have any questions concerning this application, please contact Wendy Pennington, Project Manager, at 314-452-8929 or wendy.pennington.com.

Thank you for your assistance.

Yours sincerely,

Wendy Pennington, PE
Project Manager

Samuel Fisher, CHMM
Environmental Scientist

Cc: Leroy Bealer, SOPUS
Repositories (Roxana Public Library, website)

AECOM

Application for Construction and Operating Permit
Steam Enhanced Extraction (SEE) System With Existing Regenerative Thermal Oxidizer (RTO)

8th St. and Chaffer Ave.
Roxana, Illinois
Source ID 119090AAO

FESOP No. 12040025

Prepared for
Equilon Enterprises LLC dba Shell Oil Products US

February 21, 2022

Prepared by

AECOM
100 N. Broadway, 20th Floor
St. Louis, MO 63102
(314) 429-0100

Project Number: 60674381-7.1.1

Delivering a better world

Quality information

Prepared by	Checked by	Reviewed by	Approved by
Samuel Fisher, CHMM Environmental Scientist	Brett Howell, PG Geologist	Laura Faletto, CHMM West Air Practice Dept Mngr	Wendy Pennington, PE Project Manager

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

# Hard Copies	PDF Required	Association / Company Name
1 – original 1 - copy	no	IEPA, Bureau of Air, Permit Section
None	Yes	Mr. Leroy Bealer SOPUS
None	Yes	Roxana Public Library
None	Yes	Website

Table of Contents

1. Project Summary and Requested Permit Conditions 4
1.1 Project Summary 4
1.2 Emissions Discussion 4
1.2.1 Hazardous Air Pollutant (HAP) and Other Volatile Organic Matter (VOM) Emissions 4
1.2.1.1 Boiler 4
1.2.1.2 RTO 5
1.2.1.3 Backup Vapor Granular Activated Carbon (VGAC) System 5
1.2.1.4 Emergency Generator for VGAC System 5
1.2.2 Criteria Air Pollutant Emissions 5
1.3 Summary of Potential Emissions 5
1.4 Requested Permit Conditions 6
2. Illinois EPA Application Forms 7

Tables

Table 1 – Boiler Hazardous Air Pollutant (HAP) and Other Volatile Organic Matter (VOM) Potential Emissions

Table 2 – RTO Combined HAPs & Other VOM Potential Emissions

Table 3 – Boiler Criteria Pollutant Potential Emissions

Table 4 – Summary of Potential Emissions

Figures

Figure 1 – Site Map

Figure 2 – Process Flow Diagram

Attachments

Attachment A – Equipment Specifications

Attachment B – Reference Data Used To Estimate Emissions From Steam Enhanced Extraction System

Attachment C – FESOP No: 12040025 with Requested Modifications

1. Project Summary and Requested Permit Conditions

1.1 Project Summary

Shell Oil Products US (SOPUS) proposes to install a steam enhanced extraction (SEE) system at the Roxana Site. The SEE system will be connected to the existing soil vapor extraction (SVE) system and regenerative thermal oxidizer (RTO). The existing RTO and SVE system are covered by FESOP No. 12040025 (issued October 5, 2021) and will continue to operate when the SEE system is connected. The purpose of the SEE system is to remediate contaminated soil and groundwater below the groundwater table which are not accessible to the existing SVE system.

A site map is depicted on **Figure 1**. The SEE system will use a pair of 50 horsepower (HP) blowers to pull vacuum from multiphase extraction (MPE) wells to extract vapor and liquid streams from the subsurface. The system will be equipped with a 650 HP, 25.1 MMBTU/hr natural gas-fired steam boiler, four knockout tanks, five water pumps, a light non-aqueous phase liquid (LNAPL) tank, and treated water tanks, as shown on **Figure 2**. The vacuum extraction rate will be maintained at or below 1,800 standard cubic feet per minute (scfm). The vacuum will develop the negative pressure necessary to extract and convey vapor and liquid to a series of knockout tanks, where soil vapor and water and/or LNAPL will be separated. The vapors will be conveyed by vacuum through the existing blower to the existing RTO for destruction of the hydrocarbon constituents. The RTO specifications are presented in FESOP Application No. 12040025 (IEPA received April 13, 2012). The RTO hydrocarbon destruction efficiency range is between 96 – 99%, but typical operating efficiency is >99%.

The SEE is designed such that if the RTO shuts down, a backup vapor granular activated carbon (VGAC) system will automatically continue to capture the vapor stream. In the event of a power outage, a backup generator will power the VGACs. The VGAC system consists of two in-line units, each containing 5,000 lbs of GAC. The VGAC hydrocarbon capture efficiency is 97% or greater, according to the manufacturer. The VGACs are rated to operate for up to four days during the period of peak hydrocarbon mass extraction.

The liquid stream will be conveyed by a pump to an oil/water separator (OWS). LNAPL will be drained into a 250-gal tank for offsite disposal. The LNAPL tank will be kept under negative pressure and will not be vented to atmosphere. From the OWS, water will be conveyed by a pump to an air stripper. Vapor discharge from the air stripper will be conveyed by vacuum to the RTO for destruction. Treated water will be pumped through a series of filters and a liquid granular activated carbon (LGAC) system and then into a 5,000-gal above-ground storage tank (AST) for disposal. The treated water AST will be kept under negative pressure and will not be vented to atmosphere. The system is designed to treat the discharge to below drinking water requirements for all organic contaminants. Treated water will be analyzed to confirm that concentrations meet water permit criteria.

Applicable SEE equipment specifications are included in **Attachment A**. Equipment included in Attachment A is currently specified for the SEE design. Actual installed equipment will be the equipment included in Attachment A, or equivalent. Specific manufacturers or model numbers may vary. SEE equipment will not exceed throughput or input maximums as described above.

1.2 Emissions Discussion

1.2.1 Hazardous Air Pollutant (HAP) and Other Volatile Organic Matter (VOM) Emissions

1.2.1.1 Boiler

HAP and VOM emissions from natural gas combustion at the boiler will be less than major source thresholds. The maximum potential emission rate of hazardous air pollutants (HAP) is calculated at 0.208 tons/year (0.0475 lbs/hr). The maximum combined emission rate for other volatile organic matter (VOM) is 0.382 tons/year (0.0873 lbs/hour), as shown in **Table 1**.

1.2.1.2 RTO

The SEE-derived vapor stream will be conveyed to the RTO for destruction. The RTO's destruction efficiency range is between 96 – 99%, but typical operating efficiency is >99%. For the purposes of emissions calculations for SEE-derived vapor stream, 97% efficiency was assumed. The maximum potential HAP emission rate is calculated at 3.43 tons/year (1.42 lbs/hr), as shown in **Table 2**. The maximum combined emission rate for other VOM is 0.320 tons/year (0.132 lbs/hr), as shown in **Table 2**. Reference data used to estimate SEE-derived emissions are included in **Attachment B**.

A portion of the existing SVE System, the West Fenceline leg, will continue to operate while the SEE System is operating. The emissions from the existing SVE system are already accounted for in FESOP No. 12040025 and are included in **Table 2** for informational purposes.

1.2.1.3 Backup Vapor Granular Activated Carbon (VGAC) System

The SEE system is designed to utilize a VGAC system to control emissions in the event of an RTO shutdown. If the RTO shuts down when the SEE system is operating, the SEE-derived vapor stream will automatically be directed to the VGAC units. The RTO will not produce air emissions when the VGAC system is operating. RTO and VGAC emission control efficiency are approximately equal. Therefore, there will be no additional emissions if the RTO shuts down and the VGAC system is utilized, because VGAC emissions for the shutdown period would be equivalent to or less than the lost RTO emissions for the shutdown period, as shown in **Table 2**. Operation of the steam boiler is also tied to the RTO, so that the boiler automatically shuts down if the RTO shuts down. The VGAC system is anticipated to operate for less than 100 total hours over the SEE system lifespan.

1.2.1.4 Emergency Generator for VGAC System

In the event of a power outage, the emergency generator will power the VGAC system. The emergency generator will be diesel-powered and have a maximum power of 173.5 HP, and is therefore exempt from state permit requirements per 35 IAC 201.146(i). The emergency generator will be onsite for less than one year and is exempt from federal permit requirements per 40 CFR 60.4200(e). The emergency generator is anticipated to operate for less than 100 total hours over the SEE system lifespan.

1.2.2 Criteria Air Pollutant Emissions

Criteria pollutant emissions (those associated with combustion) will be less than major source thresholds. Due to increased emissions from the steam boiler, criteria pollutant emissions limits in FESOP No. 12040025 will need to be increased, as discussed further in **Section 1.4**. The potential criteria pollutant emissions from the boiler are shown in **Table 3**.

1.3 Summary of Potential Emissions

A summary of potential new emissions associated with the proposed SEE system is included in **Table 4**; existing emissions covered by FESOP No. 12040025 are also included for reference. Existing emissions are *italicized and grayed* to make distinct from potential new emissions.

1.4 Requested Permit Conditions

SOPUS respectfully requests this proposed SEE system to be covered by FESOP No. 12040025, with the following modifications to the FESOP:

- Include reference to SEE system with boiler in permit, as indicated in **Attachment C**
- CO emissions shall not exceed 10.5 tons/year or 1.05 tons/month
- NO_x emissions shall not exceed 12.5 tons/year or 1.25 tons/month
- PM emissions shall not exceed 1.0 tons/year or 0.1 tons/month
- SO_2 emissions shall not exceed 0.1 tons/year or 0.01 tons/month

HAP and VOM emissions limits in FESOP No. 12040025 will not need to be modified.

Due to its negligible emissions, SOPUS respectfully requests that the VGAC system is not considered an emission unit for the purposes of APC-197-FEE, nor in future annual emissions reports (AERs).

A copy of FESOP No: 12040025 for Roxana Site with requested modifications in red text is included as **Attachment C**.

2. Illinois EPA Application Forms

APC-628

APC-197-FEE

APC-220 (Boiler)

APC-240 (Boiler)

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

Construction Permit Application For a FESOP Source (FORM APC628)	For Illinois EPA use only
	BOA ID No.:
	Application No.:
	Date Received:

This form is to be used to supply information to obtain a construction permit for a proposed project involving a Federally Enforceable State Operating Permit (FESOP) or Synthetic Minor source, including construction of a new FESOP source. Other necessary information must accompany this form as discussed in the "General Instructions For Permit Applications," Form APC-201.

Proposed Project

1. Working Name of Proposed Project:
   Steam Enhanced Extraction System
2. Is the project occurring at a source that already has a permit from the Bureau of Air (BOA)?
   ☐ No ☒ Yes If Yes, provide BOA ID Number: 119090AAO
3. Does this application request a revision to an existing construction permit issued by the BOA?
   ☒ No ☐ Yes If Yes, provide Permit Number:
4. Does this application request that the new/modified emission units be incorporated into an existing FESOP issued by the BOA?
   ☐ No ☒ Yes If Yes, provide Permit Number: 12040025

Source Information

5. Source name:*
   Soil Vapor Extraction System
6. Source street address:*
   WRB Refinery Near Intersection of Chaffer & 8th Streets

7. City:	8. County:	9. Zip code:
Roxana	Madison	62084

ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER.

10. Is the source located within city limits? ☒ Yes ☐ No
    If no, provide Township Name:

11. Description of source and product(s) produced:	12. Primary Classification Code of source:
Treatment of soil vapor. Product is treated exhaust.	SIC: 4613 or NAICS:
13. Latitude (DD:MM:SS.SSSS): 38:8419298	14. Longitude (DD:MM:SS.SSSS): -90.0763971

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Applicant Information

15. Who is the applicant?	16. All correspondence to: (check one)
☒ Owner ☐ Operator	☐ Owner ☒ Operator ☐ Source
17. Applicant's FEIN: 522074528	18. Attention name and/or title for written correspondence: Leroy Bealer / Principal Program Manager

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Owner Information*		
19. Name: Shell Oil Products US		
20. Address: 128 East Center Street		
21. City: Nazareth	22. State: PA	23. Zip code: 18064

* If this information different than previous information, then complete Form 272-CAAPP for a Request for Ownership Change for CAAPP Permit for an initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Operator Information (If Different from Owner)*		
24. Name AECOM Technical Services, Inc.		
25. Address: 100 N. Broadway, 20th Floor		
26. City: St. Louis	27. State: MO	28. Zip code: 63102

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Technical Contacts for Application	
29. Preferred technical contact: (check one) ☐ Applicant's contact ☒ Consultant	
30. Applicant's technical contact person for application:	
31. Contact person's telephone number	32. Contact person's email address:
33. Applicant's consultant for application: Samuel Fisher	
34. Consultant's telephone number: 314-296-1969	35. Consultant's email address: samuel.fisher@aecom.com

Review Of Contents of the Application		
36. Is the emission unit covered by this application already constructed? If "yes", provide the date construction was completed: Note: The Illinois EPA is unable to issue a construction permit for a emission unit that has already been constructed.	☐ Yes	☒ No
37. Does the application include a narrative description of the proposed project?	☒ Yes	☐ No
38. Does the application contain a list or summary that clearly identifies the emission units and air pollution control equipment that are part of the project?	☒ Yes	☐ No
39. Does the application include process flow diagram(s) for the project showing new and modified emission units and control equipment and related existing equipment and their relationships?	☒ Yes	☐ No
40. If the project is at a source that has not previously received a permit from the BOA, does the application include a source description, plot plan and site map?	☒ Yes	☐ No

Review Of Contents of the Application (continued)	
41. Does the application include relevant information for the proposed project as requested on Illinois EPA, BOA application forms (or otherwise contain all the relevant information)?	☒ Yes ☐ No
42. Does the application identify and address all applicable or potentially applicable emissions standards, including: a. State emission standards (35 IAC Chapter I, Subtitle B); b. Federal New Source Performance Standards (40 CFR Part 60); c. Federal standards for HAPs (40 CFR Parts 61 and 63)?	☒ Yes ☐ No
43. Does the application address whether the proposed project or the source could be a major project for Prevention of Significant Deterioration (PSD), 40 CFR 52.21?	☐ Yes ☐ No ☒ N/A
44. Does the application address for which pollutant(s) the proposed project or the source could be a major project for PSD, 40 CFR 52.21?	☐ Yes ☐ No ☒ N/A
45. Does the application address whether the proposed project or the source could be a major project for "Nonattainment New Source Review," (NA NSR), 35 IAC Part 203?	☐ Yes ☐ No ☒ N/A
46. Does the application address for which pollutant(s) the proposed project or the source could be a major project for NA NSR, 35 IAC Part 203?	☐ Yes ☐ No ☒ N/A
47. Does the application address whether the proposed project or the source could potentially be subject to federal Maximum Achievable Control Technology (MACT) standard under 40 CFR Part 63 for Hazardous Air Pollutants (HAP) and identify the standard that could be applicable?	☐ Yes ☐ No ☒ N/A* * Source not major ☒ Project not major ☒
48. Does the application identify the HAP(s) from the proposed project or the source that would trigger the applicability of a MACT standard under 40 CFR Part 63?	☐ Yes ☐ No ☒ N/A
49. Does the application include a summary of the current and the future potential emissions of the source after the proposed project has been completed for each criteria air pollutant and/or HAP (tons/year)?	☒ Yes ☐ No ☐ N/A* * Applicability of PSD, NA NSR or 40 CFR 63 not applicable to the source's emissions.
50. Does the application include a summary of the requested permitted annual emissions of the proposed project for the new and modified emission units (tons/year)?	☒ Yes ☐ No ☐ N/A* * Project does not involve an increase in emissions from new or modified emission units.
51. Does the application include a summary of the requested permitted production, throughput, fuel, or raw material usage limits that correspond to the annual emissions limits of the proposed project for the new and modified emission units?	☒ Yes ☐ No ☐ N/A* * Project does not involve an increase in emissions from new or modified emission units.
52. Does the application include sample calculations or methodology for the emission estimations and the requested emission limits?	☒ Yes ☐ No
53. Does the application address the relationships with and implications of the proposed project for the source's FESOP?	☒ Yes ☐ No ☐ N/A* *FESOP not yet issued.
54. If the application contains information that is considered a TRADE SECRET, has such information been properly marked and claimed and other requirements to perfect such a claim been satisfied in accordance with 35 IAC Part 130? Note: "Claimed information will not be legally protected from disclosure to the public if it is not properly claimed or does not qualify as trade secret information.	☐ Yes ☐ No ☒ N/A* * No information in the application is claimed to be a TRADE SECRET

Review Of Contents of the Application (continued)		
55. If the source is located in a county other than Cook County, are two separate copies of this application being submitted?	☒ Yes	☐ No
56. If the source is located in Cook County, are three separate copies of this application being submitted?	☐ Yes	☒ No
57. Does the application include a completed "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION," Form 197-FEE, for the emission units and control equipment for which a permit for construction or modification is being sought?	☒ Yes	☐ No
58. Does the application include a check in the proper amount for payment of the Construction permit fee?	☒ Yes	☐ No

Note: Answering "No" to Items 36 through 58 may result in the application being deemed incomplete.

Signature Block

Pursuant to 35 IAC 201.159, all applications and supplements thereto shall be signed by the owner and operator of the source, or their authorized agent, and shall be accompanied by evidence of authority to sign the application. Applications without a signed certification will be deemed incomplete.

59. Authorized Signature:

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete and that I am a responsible official for the source, as defined by Section 39.5(1) of the Environmental Protection Act. In addition, the technical contact person identified above is authorized to submit (by hard copy and/or by electronic copy) any supplemental information related to this application that may be requested by the Illinois EPA.

BY: _____ Principal Program Manager

AUTHORIZED SIGNATURE — TITLE OF SIGNATORY

Leroy Bealer — 2 3 22

TYPED OR PRINTED NAME OF SIGNATORY — DATE

Illinois Environmental Protection Agency

Bureau of Air • 1021 North Grand Avenue East • P.O. Box 19506 • Springfield • Illinois • 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID Number: _____ Permit #: _____

☐ Complete ☐ Incomplete Date Complete: _____

Check Number: _____ Account Name: _____

This form is to be used to supply fee information that must accompany all construction permit applications. This application must include payment in full to be deemed complete. Make check or money order payable to the Illinois Environmental Protection Agency, Division of Air Pollution Control - Permit Section at the above address. Do NOT send cash. Refer to instructions (197-INST) for assistance.

Source Information

1. Source Name: Soil Vapor Extraction System
2. Project Name: Steam Enhanced Extraction System
3. Source ID #: (if applicable) 119090AAO
4. Contact Name: Wendy Pennington
5. Contact Phone #: (314) 452-8929

Fee Determination

6. The boxes below are automatically calculated.

Section 1 Subtotal $0.00 + Section 2, 3 or 4 Subtotal $4,000.00 = $4,000.00 Grand Total

Section 1: Status of Source/Purpose of Submittal

7. Your application will fall under only one of the following five categories described below. Check the box that applies. Proceed to applicable sections. For purposes of this form:

- **Major Source** is a source that is required to obtain a CAAPP permit.
- **Synthetic Minor Source** is a source that has taken limits on potential to emit in a permit to avoid CAAPP permit requirements (e.g.,FESOP).
- **Non-Major Source** is a source that is not a major or synthetic minor source.

☑ Existing source without status change or with status change from synthetic minor to major source or vice versa. Proceed to Section 2.

☐ Existing non-major source that will become synthetic minor to major source. Proceed to Section 4.

☐ New major or synthetic minor source. Proceed to Section 4.

☐ New non-major source. Proceed to Section 3.

☐ AGENCY ERROR. If this is a timely request to correct an issued permit that involves only an agency error and if the request is received within the deadline for a permit appeal to the Pollution Control Board. Skip Sections 2, 3 and 4. Proceed directly to Section 5.

$0.00
Section 1 Subtotal

This agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 ET SEQ. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Section 2: Special Case Filing Fee

8. **Filing Fee**. If the application only addresses one or more of the following, check the appropriate boxes, skip Sections 3 and 4 and proceed directly to Section 5. Otherwise, proceed to Section 3 or 4 as appropriate.

Addition or replacement of control devices on permitted units.
Pilot projects/trial burns by a permitted unit
Land remediation projects $0.00
Revisions related to methodology or timing for emission testing
Minor administrative-type change to a permit

Section 3: Fees for Current or Projected Non-Major Sources

9.	This application consists of a single new emission unit or no more than two modified emission units. ($500 fee)	9. _____
10.	This application consists of more than one new emission unit or more than two modified units. ($1,000 fee)	10. $0.00
11.	This application consists of a new source or emission unit subject to Section 39.2 of the Act (i.e., Local Siting Review); a commercial incinerator or a municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or an emission unit designated as a complex source by agency rulemaking. ($15,000 fee)	11. _____
12.	A public hearing is held (see instructions). ($10,000 fee)	12. _____
13.	Section 3 subtotal. (lines 9 through 12 - entered on page 1)	13. $0.00

Section 4: Fees for Current or Projected Major or Synthetic Minor Sources

Application contains modified emission units only	14. For the first modified emission unit, enter $2,000.	
	15. Number of additional modified emission units = x $1,000.	15. $0.00
	16. Line 14 plus line 15, or $5,000, whichever is less.	16. $0.00
Application contains new and/or modified emission units	17. For the first new emission unit, enter $4,000.	17. $4,000.00
	18. Number of additional new and/or modified emission units = 0 x $1,000.	18. $0.00
	19. Line 17 plus line 18, or $10,000, whichever is less.	19. $4,000.00
Application contains netting exercise	20. Number of individual pollutants that rely on a netting exercise or contemporaneous emissions decrease to avoid application of PSD or nonattainment area NSR = _____ x $3,000.	20. $0.00
Additional Supplemental Fees	21. If the new source or emission unit is subject to Section 39.2 of the Act (i.e. siting); a commercial incinerator or other municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or one or more other emission units designated as a complex source by Agency rulemaking, enter $25,000.	21. _____
	22. If the source is a new major source subject to PSD, enter $12,000.	22. _____
	23. If the project is a major modification subject to PSD, enter $6,000.	23. _____
	24. If this is a new major source subject to nonattainment area (NAA) NSR, enter $20,000.	24. _____
	25. If this is a major modification subject to NAA NSR, enter $12,000.	25. _____
	26. If the application involves a determination of MACT for a pollutant and the project is not subject to BACT or LAER for the related pollutant under PSD or NSR (e.g., VOM for organic HAP), enter $5,000 per unit for which a determination is requested or otherwise required. _____ x $5,000.	26. $0.00
	27. If a public hearing is held (see instructions), enter $10,000.	27. _____
28. Section 4 subtotal (line 16 and lines 19 through 28) to be entered on page1		28. $4,000.00

Section 5: Certification

NOTE: Applications without a signed certification will be deemed incomplete.

29. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the information contained in this fee application form is true, accurate and complete.

by: _____ Principal Program Manager

Signature — Title of Signatory

Leroy Bealer — 2/3/22

Typed or Printed Name of Signatory — Date

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
1021 NORTH GRAND AVENUE, EAST
SPRINGFIELD, ILLINOIS 62702

* DATA AND INFORMATION PROCESS EMISSION SOURCE	

* THIS INFORMATION FORM IS TO BE COMPLETED FOR AN EMISSION SOURCE OTHER THAN A FUEL COMBUSTION EMISSION SOURCE OR AN INCINERATOR. A FUEL COMBUSTION EMISSION SOURCE IS A FURNACE, BOILER, OR SIMILAR EQUIPMENT USED PRIMARILY FOR PRODUCING HEAT OR POWER BY INDIRECT HEAT TRANSFER. AN INCINERATOR IS AN APPARATUS IN WHICH REFUSE IS BURNED.

1. NAME OF PLANT OWNER:	2. NAME OF CORPORATE DIVISION OR PLANT (IF DIFFERENT FROM OWNER):
Shell Oil Products US	
3. STREET ADDRESS OF EMISSION SOURCE:	4. CITY OF EMISSION SOURCE:
WRB Refinery Near Intersection of Chaffer & 8th St	Roxana

GENERAL INFORMATION		
5. NAME OF PROCESS: Steam Enhanced Extraction Treatment System	6. NAME OF EMISSION SOURCE EQUIPMENT: Steam Boiler	
7. EMISSION SOURCE EQUIPMENT MANUFACTURER: Superior Boiler	8. MODEL NUMBER: 11-X-2000-S200-M	9. SERIAL NUMBER:
10. FLOW DIAGRAM DESIGNATION(S) OF EMISSION SOURCE: Steam Boiler		
11. IDENTITY(S) OF ANY SIMILAR SOURCE(S) AT THE PLANT OR PREMISES NOT COVERED BY THE FORM (IF THE SOURCE IS COVERED BY ANOTHER APPLICATION, IDENTIFY THE APPLICATION):		
12. AVERAGE OPERATING TIME OF EMISSION SOURCE: 24 HRS/DAY 7 DAYS/WK 52 WKS/YR	13. MAXIMUM OPERATING TIME OF EMISSION SOURCE: 24 HRS/DAY 7 DAYS/WK 52 WKS/YR	
14. PERCENT OF ANNUAL THROUGHPUT: DEC-FEB 25 % MAR-MAY 25 % JUN-AUG 25 % SEPT-NOV 25 %		

INSTRUCTIONS

1. COMPLETE THE ABOVE IDENTIFICATION AND GENERAL INFORMATION SECTION.
2. COMPLETE THE RAW MATERIAL, PRODUCT, WASTE MATERIAL, AND FUEL USAGE SECTIONS FOR THE PARTICULAR SOURCE EQUIPMENT. COMPOSITIONS OF MATERIALS MUST BE SUFFICIENTLY DETAILED TO ALLOW DETERMINATION OF THE NATURE AND QUANTITY OF POTENTIAL EMISSIONS. IN PARTICULAR, THE COMPOSITION OF PAINTS, INKS, ETC., AND ANY SOLVENTS MUST BE FULLY DETAILED.
3. EMISSION AND EXHAUST POINT INFORMATION MUST BE COMPLETED, UNLESS EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.
4. OPERATION TIME AND CERTAIN OTHER ITEMS REQUIRE BOTH AVERAGE AND MAXIMUM VALUES
5. FOR GENERAL INFORMATION REFER TO "GENERAL INSTRUCTIONS FOR PERMIT APPLICATIONS," APC-201.

DEFINITIONS

AVERAGE - THE VALUE THAT SUMMARIZES OR REPRESENTS THE GENERAL CONDITION OF THE EMISSION SOURCE, OR THE GENERAL STATE OF PRODUCTION OF THE EMISSION SOURCE. SPECIFICALLY:
AVERAGE OPERATING TIME - ACTUAL TOTAL HOURS OF OPERATION FOR THE PRECEDING TWELVE MONTH PERIOD.
AVERAGE RATE - ACTUAL TOTAL QUANTITY OF "MATERIAL" FOR THE PRECEDING TWELVE MONTH PERIOD, DIVIDED BY THE AVERAGE OPERATING TIME.
AVERAGE OPERATION - OPERATION TYPICAL OF THE PRECEDING TWELVE MONTH PERIOD, AS REPRESENTED BY AVERAGE OPERATING TIME AND AVERAGE RATES.

MAXIMUM - THE GREATEST VALUE ATTAINABLE OR ATTAINED FOR THE EMISSION SOURCE, OR THE PERIOD OF GREATEST OR UTMOST PRODUCTION OF THE EMISSION SOURCE. SPECIFICALLY:
MAXIMUM OPERATING TIME - GREATEST EXPECTED TOTAL HOURS OF OPERATIONS FOR ANY TWELVE MONTH PERIOD.
MAXIMUM RATE - GREATEST QUANTITY OF "MATERIAL" EXPECTED PER ANY ONE HOUR OF OPERATION.
MAXIMUM OPERATION - GREATEST EXPECTED OPERATION, AS REPRESENTED BY MAXIMUM OPERATING TIME AND MAXIMUM RATES.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

RAW MATERIAL INFORMATION		
NAME OF RAW MATERIAL	AVERAGE RATE PER IDENTICAL SOURCE	MAXIMUM RATE PER IDENTICAL SOURCE
20a. natural gas at 24,614 SCF/hour	b. LB/HR	c. LB/HR
21a.	b. LB/HR	c. LB/HR
22a.	b. LB/HR	c. LB/HR
23a.	b. LB/HR	c. LB/HR
24a.	b. LB/HR	c. LB/HR

PRODUCT INFORMATION		
NAME OF PRODUCT	AVERAGE RATE PER IDENTICAL SOURCE	MAXIMUM RATE PER IDENTICAL SOURCE
30a. natural gas combustion byproducts	b. LB/HR	c. LB/HR
31a.	b. LB/HR	c. LB/HR
32a.	b. LB/HR	c. LB/HR
33a.	b. LB/HR	c. LB/HR
34a.	b. LB/HR	c. LB/HR

WASTE MATERIAL INFORMATION		
NAME OF WASTE MATERIAL	AVERAGE RATE PER IDENTICAL SOURCE	MAXIMUM RATE PER IDENTICAL SOURCE
40a. none	b. LB/HR	c. LB/HR
41a.	b. LB/HR	c. LB/HR
42a.	b. LB/HR	c. LB/HR
43a.	b. LB/HR	c. LB/HR
44a.	b. LB/HR	c. LB/HR

*FUEL USAGE INFORMATION			
FUEL USED		TYPE	HEAT CONTENT
50a. NATURAL GAS	☐	b. ----------	c. 1000 BTU/SCF
OTHER GAS	☒	natural gas	1020 BTU/SCF
OIL	☐		BTU/GAL
COAL	☐		BTU/LB
OTHER	☐		BTU/LB

d. AVERAGE FIRING RATE PER IDENTICAL SOURCE:	e. MAXIMUM FIRING RATE PER IDENTICAL SOURCE:
25106000 BTU/HR	25106000 BTU/HR

*THIS SECTION IS TO BE COMPLETED FOR ANY FUEL USED DIRECTLY IN THE PROCESS EMISSION SOURCE, E. G. GAS IN A DRYER, OR COAL IN A MELT FURNACE.

*EMISSION INFORMATION

51. NUMBER OF IDENTICAL SOURCES (DESCRIBE AS REQUIRED):
zero

AVERAGE OPERATION

CONTAMINANT	CONCENTRATION OR EMISSION RATE PER IDENTICAL SOURCE		METHOD USED TO DETERMINE CONCENTRATION OR EMISSION RATE
PARTICULATE MATTER	52a. GR/SCF	b. 0.19 LB/HR	c. see APC-240
CARBON MONOXIDE	53a. PPM (VOL)	b. 2.11 LB/HR	c. see APC-240
NITROGEN OXIDES	54a. PPM (VOL)	b. 2.51 LB/HR	c. see APC-240
ORGANIC MATERIAL	55a. PPM (VOL)	b. 0.09 LB/HR	c. see APC-240
SULFUR DIOXIDE	56a. PPM (VOL)	b. 0.02 LB/HR	c. see APC-240
**OTHER (SPECIFY)	57a. PPM (VOL)	b. 0.05 LB/HR	c. HAPs (see APC-240)

MAXIMUM OPERATION

CONTAMINANT	CONCENTRATION OR EMISSION RATE PER IDENTICAL SOURCE		METHOD USED TO DETERMINE CONCENTRATION OR EMISSION RATE
PARTICULATE MATTER	58a. GR/SCF	b. 0.19 LB/HR	c. see APC-240
CARBON MONOXIDE	59a. PPM (VOL)	b. 2.11 LB/HR	c. see APC-240
NITROGEN OXIDES	60a. PPM (VOL)	b. 2.51 LB/HR	c. see APC-240
ORGANIC MATERIAL	61a. PPM (VOL)	b. 0.09 LB/HR	c. see APC-240
SULFUR DIOXIDE	62a. PPM (VOL)	b. 0.02 LB/HR	c. see APC-240
**OTHER (SPECIFY)	63a. PPM (VOL)	b. 0.05 LB/HR	c. HAPs (see APC-240)

*ITEMS 52 THROUGH 63 NEED NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.
**"OTHER" CONTAMINANT SHOULD BE USED FOR AN AIR CONTAMINANT NOT SPECIFICALLY NAMED ABOVE. POSSIBLE OTHER CONTAMINANTS ARE ASBESTOS, BERYLLIUM, MERCURY, VINYL CHLORIDE, LEAD, ETC.

***EXHAUST POINT INFORMATION

64. FLOW DIAGRAM DESIGNATION(S) OF EXHAUST POINT:

65. DESCRIPTION OF EXHAUST POINT (LOCATION IN RELATION TO BUILDINGS, DIRECTION, HOODING, ETC.):
24" diameter vertical steel stack with rain cap

66. EXIT HEIGHT ABOVE GRADE: 13 ft	67. EXIT DIAMETER: 24 in
68. GREATEST HEIGHT OF NEARBY BUILDINGS: 12 ft	69. EXIT DISTANCE FROM NEAREST PLANT BOUNDARY: <100 ft

AVERAGE OPERATION	MAXIMUM OPERATION
70. EXIT GAS TEMPERATURE: 400 F	72. EXIT GAS TEMPERATURE: 400 F
71. GAS FLOW RATE THROUGH EACH EXIT: 7000 ACFM	73. GAS FLOW RATE THROUGH EACH EXIT: 7000 ACFM

***THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
1021 NORTH GRAND AVENUE, EAST
SPRINGFIELD, ILLINOIS 62702

* DATA AND INFORMATION FUEL COMBUSTION EMISSION SOURCE	

* THIS INFORMATION FORM IS TO BE COMPLETED FOR A FURNACE, BOILER, OR SIMILAR EQUIPMENT USED FOR THE PRIMARY PURPOSE OF PRODUCING HEAT OR POWER BY INDIRECT HEAT TRANSFER. AN EMISSION SOURCE THAT DOES NOT FIT THIS DESCRIPTION, INCLUDING AND EMISSION SOURCE USING DIRECT HEATING, IS EITHER A PROCESS EMISSION SOURCE OR AN INCINERATOR.

1. NAME OF PLANT OWNER: Shell Oil Products US	2. NAME OF CORPORATE DIVISION OR PLANT (IF DIFFERENT FROM OWNER):
3. STREET ADDRESS OF EMISSION SOURCE: WRB Refinery Near Intersection of Chaffer & 8th	4. CITY OF EMISSION SOURCE: Roxana

GENERAL INFORMATION

5. FLOW DIAGRAM DESIGNATION(S) OF EMISSION SOURCE: Steam Boiler

6. MANUFACTURER:	7. MODEL NUMBER:	8. SERIAL NUMBER:
Superior Boiler	11-X-2000-S200-M	

9. AVERAGE OPERATING TIME OF EMISSION SOURCE:	10. MAXIMUM OPERATING TIME OF EMISSION SOURCE:
24 HRS/DAY 7 DAYS/WK 52 WKS/YR	24 HRS/DAY 7 DAYS/WK 52 WKS/YR

11. PERCENT OF ANNUAL HEAT INPUT:
DEC-FEB 25 % MAR-MAY 25 % JUN-AUG 25 % SEPT-NOV 25 %

INSTRUCTIONS

1. COMPLETE THE ABOVE IDENTIFICATION AND GENERAL INFORMATION SECTION.
2. COMPLETE THE APPROPRIATE FUEL SECTION OR SECTIONS. IF MORE THAN ONE FUEL IS FIRED OR IF THE CAPABILITY EXISTS TO FIRE MORE THAN ONE FUEL, THE ACTUAL USAGE OF FUELS AND THE RELATIONSHIP BETWEEN FUELS, SIMULTANEOUS FIRING, ALTERNATE FIRING, RESERVE FUEL, ETC., MUST BE MADE CLEAR.
3. EMISSION AND EXHAUST POINT INFORMATION MUST BE COMPLETED, UNLESS EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.
4. FIRING RATES AND CERTAIN OTHER ITEMS REQUIRE BOTH AVERAGE AND MAXIMUM VALUES
5. FOR GENERAL INFORMATION REFER TO "GENERAL INSTRUCTIONS FOR PERMIT APPLICATIONS," APC-201.

DEFINITIONS

AVERAGE - THE VALUE THAT SUMMARIZES OR REPRESENTS THE GENERAL CONDITION OF THE EMISSION SOURCE, OR THE GENERAL STATE OF HEAT PRODUCTION OF THE EMISSION SOURCE. SPECIFICALLY:
AVERAGE OPERATING TIME - ACTUAL TOTAL HOURS OF OPERATION FOR THE PRECEDING TWELVE MONTH PERIOD.
AVERAGE RATE - ACTUAL TOTAL QUANTITY OF "MATERIAL" FOR THE PRECEDING TWELVE MONTH PERIOD, DIVIDED BY THE AVERAGE OPERATING TIME.
AVERAGE OPERATION - OPERATION TYPICAL OF THE PRECEDING TWELVE MONTH PERIOD, AS REPRESENTED BY AVERAGE OPERATING TIME AND AVERAGE RATES.

MAXIMUM - THE GREATEST VALUE ATTAINABLE OR ATTAINED FOR THE EMISSION SOURCE, OR THE PERIOD OF GREATEST OR UTMOST HEAT PRODUCTION OF THE EMISSION SOURCE. SPECIFICALLY:
MAXIMUM OPERATING TIME - GREATEST EXPECTED TOTAL HOURS OF OPERATIONS FOR ANY TWELVE MONTH PERIOD.
MAXIMUM RATE - GREATEST QUANTITY OF "MATERIAL" EXPECTED PER ANY ONE HOUR OF OPERATION.
MAXIMUM OPERATION - GREATEST EXPECTED OPERATION, AS REPRESENTED BY MAXIMUM OPERATING TIME AND MAXIMUM RATES.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

GAS FIRING

*11. ORIGIN OF GAS: ☐ DISTILLATE FUEL OIL GASIFICATION ☐ OTHER LIQUID FUEL GASIFICATION ☐ SOLID FUEL GASIFICATION ☐ BYPRODUCT SPECIFY SOURCE
☐ PIPELINE

12. ARE YOU ON AN INTERRUPTABLE GAS SUPPLY: ☐ YES ☒ NO
IF "YES", SPECIFY ALTERNATE FUEL:

13. ANNUAL CONSUMPTION:	*14. HEAT CONTENT:	*15. SULFUR CONTENT:
215,616,235 SCF	BTU/SCF	% BY WT.

16. AVERAGE FIRING RATE:	17. MAXIMUM FIRING RATE:
25.106 BTU/HR	25.106 BTU/HR

* IF THE GAS FIRED IS NATURAL GAS, THESE ITEMS NEED NOT BE COMPLETED.

OIL FIRING

18. TYPE OF OIL:
GRADE NUMBER: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 OTHER: SPECIFY

19. ANNUAL CONSUMPTION:	20. HEAT CONTENT:
GALLONS	☐ BTU/LB ☐ BTU/GAL
21. SULFUR CONTENT: % BY WT	22. ASH CONTENT: % BY WT

23. DIRECTION OF FIRING:
☐ HORIZONTAL ☐ TANGENTIAL ☐ OTHER: SPECIFY

24. AVERAGE FIRING RATE:	25. MAXIMUM FIRING RATE:
BTU/HR	BTU/HR

SOLID FUEL FIRING

26. TYPE OF SOLID FUEL
☐ SUB-BITUMINOUS COAL ☐ BITUMINOUS COAL ☐ ANTHRACITE COAL ☐ OTHER: SPECIFY

27. ANNUAL CONSUMPTION:	28. HEAT CONTENT AS FIRED:
TONS	BTU/LB

29. MOISTURE CONTENT AS FIRED:	30. ASH CONTENT AS FIRED:	31. SULFUR CONTENT AS FIRED:
% BY WT.	% BY WT.	% BY WT.

32. TYPE OF FIRING:
☐ CYCLONE ☐ PULVERIZED { ☐ WET BOTTOM OR ☐ DRY BOTTOM, ☐ HORIZONTALLY OPPOSED OR ☐ OTHER: SPECIFY _____

☐ SPREADER STOKER: % REINJECTION ☐ OTHER: SPECIFY

33. AVERAGE FIRING RATE:	34. MAXIMUM FIRING RATE:
BTU/HR	BTU/HR

SUBMIT COPIES OF THOSE PORTIONS OF COAL OR OTHER SOLID FUEL CONTRACTS WHICH SET FORTH THE SPECIFICATIONS OF THE FUEL AND THE DURATION OF THE CONTRACT. IF THE ACTUAL FUEL FIRED IS A BLEND OF SOLID FUELS, SUBMIT APPROPRIATE PORTIONS OF ALL FUEL CONTRACTS AND SET FORTH THE MANNER IN WHICH THE FUELS ARE BLENDED AND ACTUALLY FRIED. REFERENCE THIS INFORMATION TO THIS FORM.

*EMISSION INFORMATION

35. NUMBER OF IDENTICAL SOURCES (DESCRIBE AS REQUIRED): zero

AVERAGE OPERATION

CONTAMINANT	CONCENTRATION OR EMISSION RATE PER IDENTICAL SOURCE			METHOD USED TO DETERMINE CONCENTRATION OR EMISSION RATE
PARTICULATE MATTER	36a. GR/SCF	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
CARBON MONOXIDE	37a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
NITROGEN OXIDES	38a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
ORGANIC MATERIAL	39a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
SULFUR DIOXIDE	40a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.

MAXIMUM OPERATION

CONTAMINANT	CONCENTRATION OR EMISSION RATE PER IDENTICAL SOURCE			METHOD USED TO DETERMINE CONCENTRATION OR EMISSION RATE
PARTICULATE MATTER	41a. GR/SCF	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
CARBON MONOXIDE	42a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
NITROGEN OXIDES	43a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
ORGANIC MATERIAL	44a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.
SULFUR DIOXIDE	45a. PPM (VOL)	b.	☐ LB/10^6 BTU ☐ LB/HR	c.

* IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT, OR IF NATURAL GAS IS THE FUEL FIRED, ITEMS 36 THROUGH 47 NEED NOT BE COMPLETED.

**EXHAUST POINT INFORMATION

46. FLOW DIAGRAM DESIGNATION(S) OF EXHAUST POINT: NA

47. DESCRIPTION OF EXHAUST POINT (LOCATION IN RELATION TO BUILDINGS, DIRECTION, HOODING, ETC.): NA

48. EXIT HEIGHT ABOVE GRADE: 13 ft	50. EXIT DIAMETER: 24 in
49. GREATEST HEIGHT OF NEARBY BUILDINGS: 12 ft	51. EXIT DISTANCE FROM NEAREST PLANT BOUNDARY: <100 FT

AVERAGE OPERATION	MAXIMUM OPERATION
52. EXIT GAS TEMPERATURE: 400 °F	54. EXIT GAS TEMPERATURE: 400 °F
53. GAS FLOW RATE THROUGH EACH EXIT: 7000 ACFM	55. GAS FLOW RATE THROUGH EACH EXIT: 7000 ACFM

** IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT THIS SECTION SHOULD NOT BE COMPLETED.

Tables

Table 1 – Boiler Hazardous Air Pollutant (HAP) and Other Volatile Organic Matter (VOM) Potential Emissions

Table 2 – RTO Combined HAPs & Other VOM Potential Emissions

Table 3 – Boiler Criteria Pollutant Potential Emissions

Table 4 – Summary of Potential Emissions

Table 1

Boiler Hazardous Air Pollutant (HAP) and Other Volatile Organic Matter (VOM) Potential Emissions

Monthly Combined HAP Emissions	Monthly Combined HAP Emissions	Annual Combined HAP Emissions	Monthly Other VOM Emissions	Monthly Other VOM Emissions	Annual Other VOM Emissions
tons/month	lbs/hour	tons/year	tons/month	lbs/hour	tons/year
1.73E-02	4.75E-02	2.08E-01	3.19E-02	8.73E-02	3.82E-01

Maximum[1] Design Rate	Heating Value	Maximum Fuel Throughput	Combined HAP Emission Factor[2]	Other VOM Emission Factor[2]
MMBTU/hr	BTU/SCF	SCF/hr	lb/MMBtu	lb/MMBtu
25.106	1020	24614	1.89E-03	3.48E-03

Notes:

1. According to Superior Boiler for the 11-X-2000-S200-M boiler
2. Emission factors from AP-42 External Combution Sources, 1.4 Natural Gas Combustion

Table 2
RTO Combined Hazardous Air Pollutants (HAPs) & Other Volatile Organic Matter (VOM) Potential Emissions

	Monthly Combined HAPs Emissions	Monthly Combined HAPs Emissions	Annual Combined HAPs Emissions	Monthly Other VOM Emissions	Monthly Other VOM Emissions	Annual Other VOM Emissions
	tons/month	lbs/hour	tons/year	tons/month	lbs/hour	tons/year
RTO Emissions from SVE System [1,2,3]	*7.83E-02*	*2.15E-01*	*9.40E-01*	*1.72E-01*	*4.70E-01*	*2.06E+00*
RTO Emissions from PWY SEE System[4,5]	5.28E-01	1.42E+00	3.43E+00	4.93E-02	1.32E-01	3.20E-01
VGACs Emissions[13]	0.00	0.00	0.00	0.00	0.00	0.00
Total	**6.06E-01**	**1.63E+00**	**4.37E+00**	**2.21E-01**	**6.03E-01**	**2.38E+00**

Assumptions for Steam Enhanced Extraction (SEE) System Emissions

HAP mass in treatment area soil & groundwater (lbs)[9]	Other VOM mass in treatment area soil & groundwater (lbs)[9]	Emission Control Efficiency[6]	Days in Month	% of well field hydrcarbon extracted per day during peak[4,5]	lbs/ton	Hours in Month	Months of Operation[8]
32,416	3,027	97%	31	3.5%	2000	744	12

Assumptions for Backup VGACs (Vapor Granular Activated Carbon) Emissions[10]

HAP mass in treatment area soil & groundwater (lbs)[9]	Other VOM mass in treatment area soil & groundwater (lbs)[9]	Emission Control Efficiency[12]	Days in RTO shutdown period[11]	% of well field hydrcarbon extracted per day during peak[4,5]	lbs/ton	Hours in RTO shutdown period
32,416	3,027	97%	4	3.5%	2000	96

Notes:

1 RTO VOM and HAP emissions (tons/year) from SVE System are same as in FESOP Application No. 12040025 (IEPA received April 13, 2012).

2 RTO emissions from SVE System are already accounted for in FESOP No. 12040025 (issued October 5, 2021).

3 Existing RTO emissions are *italicized and grayed* to make distinct from potential new emissions.

4 RTO Exhaust sample is assumed to occur on the day of peak well field hydrocarbon mass extraction (i.e. 3.5% of total available mass from the well field extracted on that day)

5 Peak hydrocarbon mass removal will only occur once, so annual PWY SEE System emissions account for 1 month of peak mass removal, and 11 months of half the peak.

6 RTO destruction efficiency of SEE Influent stream was assumed to be 97% to be conservative, but actual measured destruction efficiency of RTO unit has been above 97%.

7 Typical RTO operational destruction efficiency is above 99%.

8 SEE operation is not planned to exceed 6 months, but 12 months is assumed to be conservative.

9 Calculations for available HAP/VOM mass estimate are based on EVS models using results from 2019 Predesign Investigation (same data were used to design the SEE System).

10 Emergency VGACs will be utilized to control emissions in the event of an unplanned RTO shutdown.

11 For the purpose of emissions estimates, the VGACs is assumed to be utilized for 4 days during a 4-day RTO shutdown that occurs during peak mass removal.

12 VGACs hydrocarbon capture efficiency is 97% or greater, per the manufacturer (tetraSOLV VFV-5000 unit).

13 4 days of lost RTO emissions will be subtracted from the 4 days of VGACs emissions calculated here, since the RTO will not be running if VGACs are in use. Because emission control efficiency of RTO and VGACs are approximately equal, net VGACs emissions are zero.

Table 3
Boiler Criteria Pollutant Potential Emissions

Maximum[1] Design Rate	Heating Value	Maximum Fuel Throughput	SO_2 Emission Factor[2]	NO_x Emission Factor[2]	CO Emission Factor[2]	PM Emission Factor[2]	Potential SO_2 Emission Rate	Potential NOx Emission Rate	Potential CO Emission Rate	Potential PM Emission Rate
(MMBtu/hr)	BTU/SCF	SCF/hr	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	tons/year	tons/year	tons/year	tons/year
25.106	1020	24614	6.00E-04	1.00E-01	8.40E-02	7.60E-03	6.60E-02	1.10E+01	9.24E+00	8.36E-01

Notes:
1. According to Superior Boiler for the 11-X-2000-S200-M boiler
2. Emission factors from Roxana Site FESOP No. 12040025, Condition 8b

Table 4
Summary of Potential Emissions

HAP and Other VOM Emissions	tons/year	lbs/hour
Total Boiler HAPs	2.08E-01	4.75E-02
Total Boiler Other VOM	3.82E-01	8.73E-02
Total SEE-derived RTO HAPS:	3.43E+00	1.42E+00
Total SEE-derived RTO Other VOM:	3.20E-01	1.32E-01
Total VGACs HAPs	0.00E+00	0.00E+00
Total VGAcs Other VOM	0.00E+00	0.00E+00
Existing HAP Emissions [1,2,3]	*9.40E-01*	*2.15E-01*
Existing Other VOM Emissions [1,2,3]	*2.06E+00*	*4.70E-01*
Potential New Emissions + Existing Emissions (HAPs)	4.58E+00	1.68E+00
Potential New Emissions + Existing Emissions (Other VOM)	2.76E+00	6.90E-01

Criteria Pollutant Emissions	tons/year
Steam Boiler SO_2	6.60E-02
Steam Boiler NOx	1.10E+01
Steam Boiler CO	9.24E+00
Steam Boiler PM	8.36E-01
Existing RTO SO_2 [2,3,4]	*7.90E-03*
Existing RTO NOx [2,3,4]	*1.31E+00*
Existing RTO CO [2,3,4]	*1.10E+00*
Existing RTO PM [2,3,4]	*9.99E-02*
Potential New Emissions + Existing SO_2	7.39E-02
Potential New Emissions + Existing NOx	1.23E+01
Potential New Emissions + Existing CO	1.03E+01
Potential New Emissions + Existing PM	9.36E-01

Notes:

1 RTO HAP and VOM emissions (tons/year) from SVE System are same as in FESOP Application No. 12040025 (IEPA received April 13, 2012).

2 RTO emissions from SVE System are already accounted for in FESOP No. 12040025 (issued October 5, 2021).

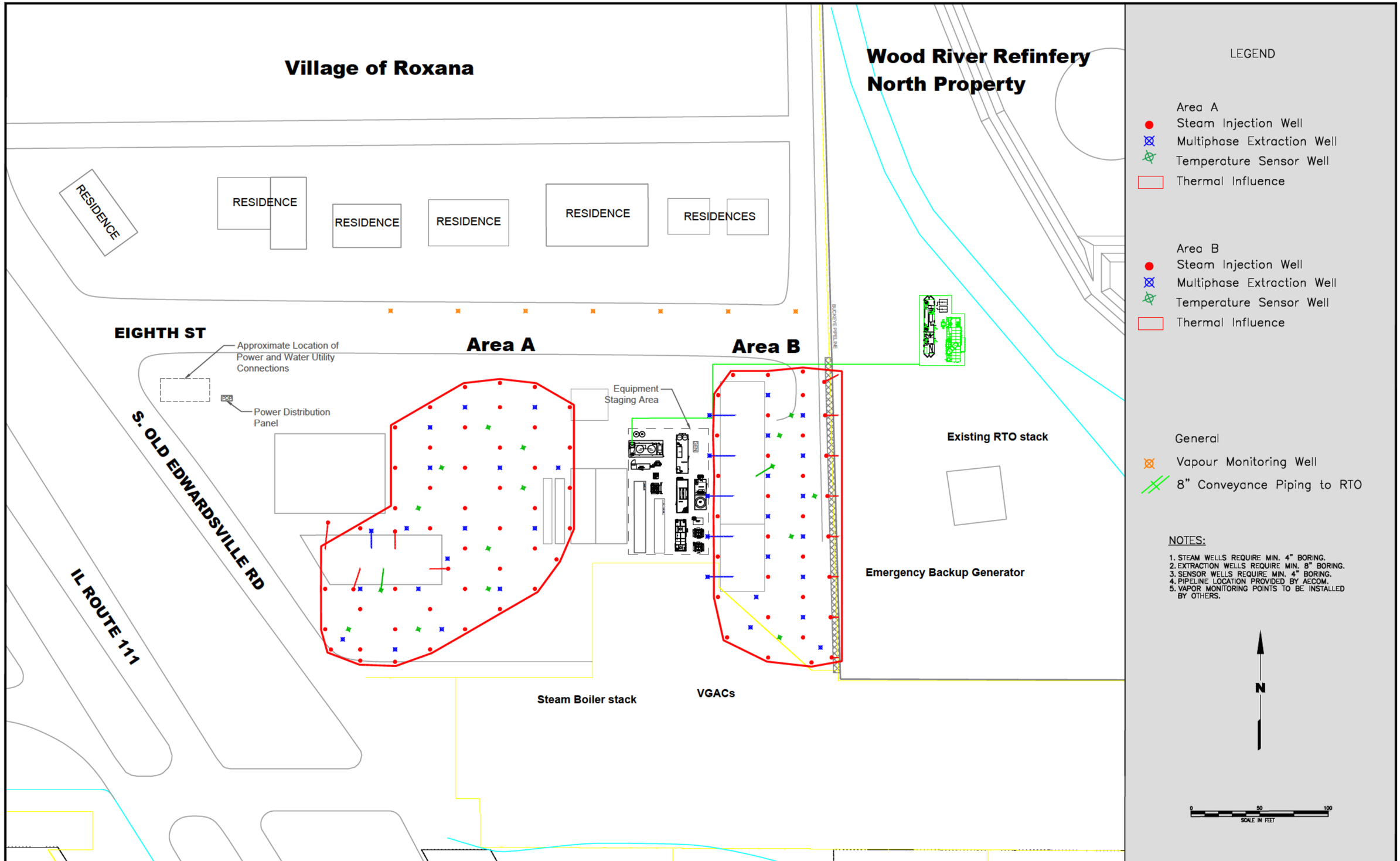
3 Existing RTO emissions are *italicized and grayed* to make distinct from potential new emissions.

4 RTO criteria pollutant emissions were calculated using emission factors from FESOP No. 12040025.

Figures

Figure 1 – Site Map

Figure 2 – Process Flow Diagram



McMillan-McGee Corp.
Electromagnetic Systems and Services For the Energy and Environmental Industries
4895 - 35B Street SE
Calgary, AB T2B 3M9 Canada
www.mcmillan-mcgee.com
Ph: 403.569.5100, Fx: 403.272.7201

REV.	DATE (D/M/Y)	DESCRIPTION	DRAWN BY	ORG/ ENGR.	Aproved Dist
C1	2022/01/07	100% DESIGN	JS	CC	CC
B6	2021/12/02	FINALIZE TREATMENT AREA B	JS	CC	CC
B4	2021/10/29	INCORPORATE 90% COMMENTS	JS	CC	CC
B3	2021/09/28	90% DESIGN	JS	CC	CC
B2	2021/09/03	MOVED SI-AA3	JS	CC	CC
B1	2021/08/27	60% DESIGN	JS	CC	CC

LPE

DATE

APEGA PERMIT NUMBER: P09178

SCALE: NOT TO SCALE

TITLE: **Site Map**

CLIENT: **AECOM**

PROJECT: **Roxana Public Works Yard**
Roxana, Illinois

SHEET: **Figure 1**

NOTES:
1. Existing Public Works Yard SVE Line (Teal Line) will be replaced by Steam Enhanced Extraction (SEE) System
2. VGAC = Vapor Granular Activated Carbon
3. LGAC = Liquid Granular Activated Carbon
4. OWS = Oil-Water Separator
5. **BOLD** text and shapes represent existing equipment that will be incorporated into the Steam Enhanced Extraction system.
6. LNAPL tank and treated water holding tank are in process and do not vent to atmosphere.

VAPOR — LNAPL — WATER — WATER AND VAPOR

WEST FENCELINE SVE WELL FIELD

240 GAL. VLS

PUMP

629 GAL. WATER STORAGE TANK

629 GAL. WATER STORAGE TANK

PUMP

2 PARALLEL BLOWERS

2 IN-LINE 100 GAL KNOCK OUTS

100 GAL KNOCKOUT

PUMP

PUMP

240 GAL. VLS

BLOWER

MIXING BOX

CURRENT REGENERATIVE THERMAL OXIDIZER

2 IN-LINE VGACS

BACKUP SYSTEM FOR REGENERATIVE THERMAL OXIDIZER SHUTDOWN

SEE WELL FIELD

200 GAL KNOCKOUT

PUMP

250 GAL LNAPL TANK

STEAM INJECTION

Stack to atmosphere

STEAM BOILER

OWS

PUMP

AIR STRIPPER

PUMP

6 IN-LINE BAG FILTERS

2 IN-LINE LGACS

5000 GAL TREATED WATER HOLDING TANK

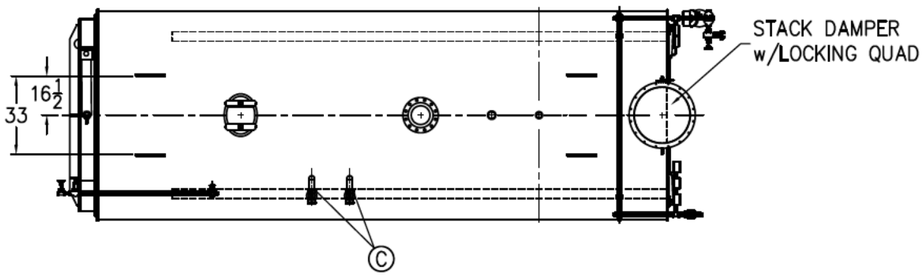
SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 60674381
AECOM		
DRN. BY: bah Jan. 2022 DSGN. BY: bah CHKD. BY: smf	SEE / SVE Process Diagram	FIG. NO. 2

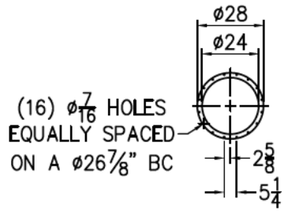
Attachments

Attachment A – Equipment Specifications

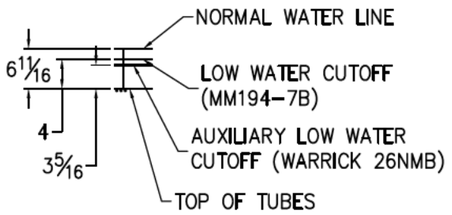
Attachment B – Reference Data Used To Estimate Emissions From Steam Enhanced Extraction System

Attachment C – FESOP No: 12040025 with Requested Modifications

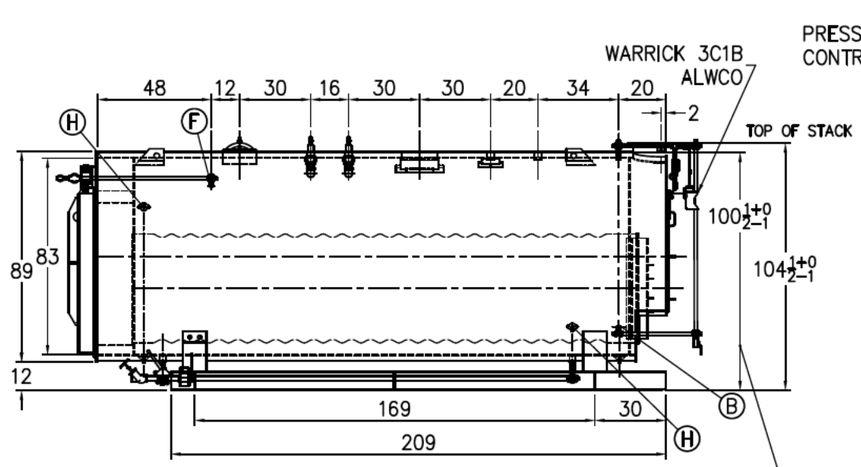


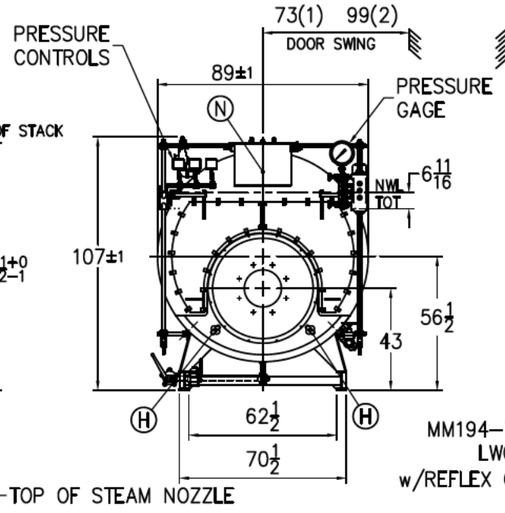


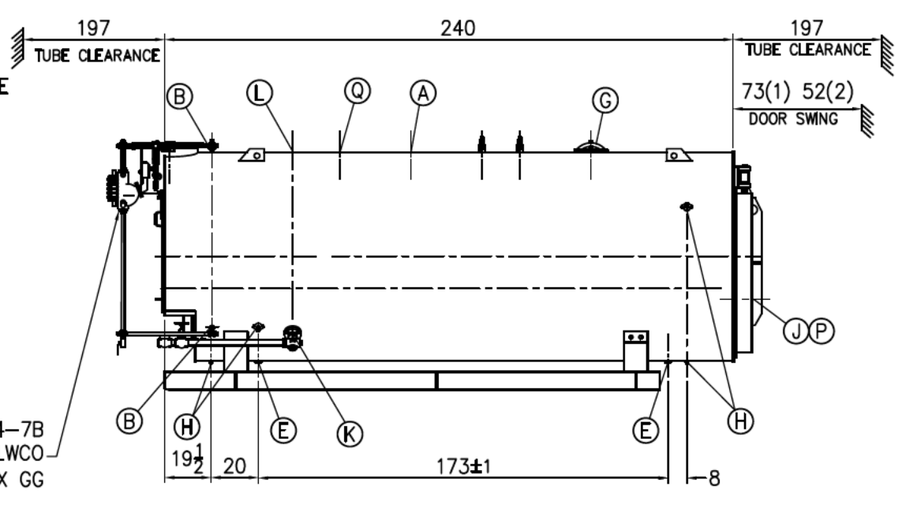
STACK FLANGE DETAIL



WATER LEVEL SEQUENCE







BOILER CONNECTIONS

A.(1)	STEAM OUTLET	8" 300# FLG
B.(3)	LWCO	1" NPT
C.(2)	SAFETY VALVE	2" NPT
D.( )	SAFETY VALVE	
E.(2)	BOILER BLOWDOWN	1 1/2" NPT
F.(1)	SURFACE BLOWDOWN	1" NPT
G.(1)	MANWAY	12" x 16"
H.(8)	HANDHOLE	3" x 4"
J.(1)	CLEANOUT	19" ID
K.(1)	FEEDWATER	2" 300# FLG
L.(1)	AUXILIARY	2" NPT
M.( )	LOW FIRE HOLD	
N.(1)	STACK TEMP	1/2" NPT
P.(1)	SIGHT PORT	1" NPT
Q.(1)	DA STEAM SUPPLY	2" NPT
R.( )		
S.( )		

RATINGS & CAPACITIES

HORSEPOWER	650*
DESIGN PRESSURE	200 PSI STEAM
GROSS OUTPUT	20,085 MBH*
STEAM (FROM & AT 212°F)	20,700 LB/HR*
HEAT RELEASE: (FURNACE ONLY)	150,322 BTU/CuFt*
RATED INPUT	25,106 MBH*
HEATING SURFACE (ASME)	2046 SqFt
FURNACE HEATING SURFACE	218.51 SqFt
FURNACE VOLUME:	
FURNACE ONLY	180.93 CuFt
STEAMING VOLUME	77.02 CuFt
STEAM RELEASE AREA	91.42 SqFt
WATER CAPACITY:	
(FULL) 2,838 Gal	@ 23,608 Lbs
(NWL) 2,262 Gal	@ 18,816 Lbs
SHIPPING WEIGHT:	31,800 Lbs

LTR	DATE	REVISION	BY

NOTES

1. ALL CONTROLS MOUNTED AS PER SPECIFICATION SHEET.
2. SPECIFICATION SHEET TAKES PRIORITY OVER R & D SHEET.
3. REAR DOOR SWING: (1) MIN SIDE, MAX REAR
   (2) MAX SIDE, MIN REAR
4. BOILER DESIGN CODE ASME SECTION I LATEST EDITION.
5. BOILER INSULATED WITH 2"-8# DENSITY MINERAL FIBER INSULATION WITH 22 GAUGE STEEL JACKET.
6. ALL DIMENSIONS ARE ±1/2" UNLESS OTHERWISE NOTED.

*7. HORSEPOWER & RELATED INFO BASED ON 3.3 SqFt FIRING.

SUPERIOR BOILER

CHECKED BY	
DRAWN BY	A. REUSSER
DATE	10-20-20
BOILER	
BOILER MODEL	11-X-2000-S200-M
SCALE	1/64
DRAWING No	21090357

REPRESENTATIVE: KC BOILER EQUIPMENT

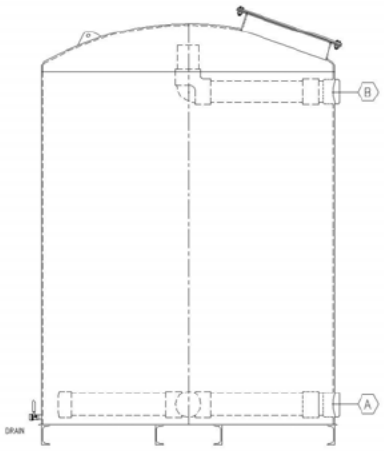
PROJECT: RENTAL BOILER

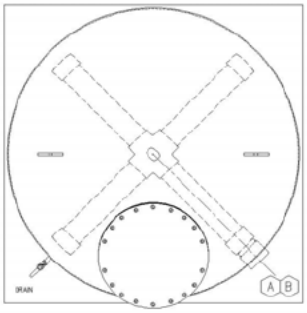
PRODUCT DATA

VFV SERIES FILTERS

VGACs (Vapor Granular Activated Carbon)

VFV series filters are designed to treat vapor streams in a wide variety of adsorption applications. The modular design enables the units to easily fit into a wide variety of installations. Standard features include steel construction with epoxy internal coating, efficient internal distributor array, forklift skid and lifting eyes.





A - Process Inlet
B - Process Outlet
C - Drain
Manway standard size 18" Round

Standard Model Shown - Detailed Submittal Drawings Available

VFV SERIES STANDARD SPECIFICATIONS

Model Number	VFV-250	VFV-500	VFV-1000	VFV-2000	VFV-3000	VFV-5000	VFV-10000
Overall Height	3'11"	5'3"	6'5"	7'7"	7'10"	9'0"	9'4"
Diameter	24"	30"	36"	48"	60"	72"	96"
Process Connection	2" FNPT	2" FNPT	3" FNPT	4" FNPT	4" FNPT	6" FNPT	6" FNPT
Typical GAC Fill (28#/FT³)	250 Lbs	500 Lbs	1,000 Lbs	2,000 Lbs	3,000 Lbs	5,000 Lbs	10,000 Lbs
Shipping Weight (empty)	165 Lbs	375 Lbs	500 Lbs	925 Lbs	1,375 Lbs	2,300 Lbs	3,150 Lbs
Operational Weight	500 Lbs	1,050 Lbs	1,800 Lbs	3,500 Lbs	5,250 Lbs	8,750 Lbs	15,800 Lbs
Air flows for standard conditions	30 to 180 CFM	50 to 300 CFM	70 to 420 CFM	125 to 750 CFM	200 to 1200 CFM	280 to 1680 CFM	500 to 3000 CFM
Available Bed Volume	9 FT³	19.5 FT³	35 FT³	75 FT³	117 FT³	196 FT³	400 FT³
Maximum Pressure	10 PSIG	10 PSIG	10 PSIG	10 PSIG	10 PSIG	10 PSIG	10 PSIG
Maximum Vacuum	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg

Revised March 2015

PRODUCT SPECIFICATIONS FOR XQ125 (emergency backup generator)

	US	Metric
Rating Prime	100 ekW (125 kVA)	
Frequency	60 Hz	
Voltage	120 - 600V	
Rating Standby	110 ekW (137 kVA)	
Engine	C4.4 ACERT	
Fuel	Diesel	
Height - Without Trailer		73 in
Length - Without Trailer		127 in
Width - Without Trailer		49 in
Weight with Lube Oil and Coolant, Without Trailer		5230 lb
100% Load 60Hz	7.5 gal/hr	
75% Load 60Hz	5.51 gal/hr	
50% Load 60Hz	3.8 gal/hr	
100% Load 60Hz	8.3 gal/hr	

Sound Power @ 7 meters (23 feet) @ Prime Rating	65 dB(A)
Sound Power @ 7 meters (23 feet) @ Standby Rating	66 dB(A)

XQ125 STANDARD EQUIPMENT

CAT C4.4 DIESEL ENGINE

Heavy-duty.
Turbocharged.
After treatment.

GENERATOR

LC3114F frame.

CONTROL PANEL

Digital EMCP4.2B set mounted controller.

CAT CONNECT REMOTE MONITORING

Provides package monitoring and management.

COOLING SYSTEM

Package mounted radiator with vertical air discharge.
Filled from factory.

CHARGING / STARTING SYSTEM

12V heavy duty starting motor and charging alternator c/w battery isolator.

FUEL SYSTEM

24hr dual wall fuel tank with 3 way directional valve for external supply.

AIR FILTER

Cyclonic/paper with dust cup and service indicator.

DISTRIBUTION

Single, robust enclosure for controls and distribution c/w 4 pole circuit breaker and safety cut off.

STRUCTURE

Heavy Duty steel base frame with integral fuel tank.

Lifting frame and 4 point lift.

Base frame is wider than enclosure to protect generator set during transportation.

ENCLOSURE

Sound attenuating, galvanised steel enclosure with exceptional noise reduction performance.

EXHAUST

Integrated spark arresting silencer.

LUBE OIL

On engine primary and secondary oil filters. Filled from factory.

GENERAL

Factory tested and inspected.

PRODUCT SPECIFICATIONS FOR C4.4 (engine in generator)

	US	Metric
Maximum Power	173.5 HP	
Maximum Torque	553 lb-ft @ 1400 rpm	
Rated Speed	2200 rpm	
Minimum Power	93.9 HP	
Emissions	U.S. EPA & CARB Tier 4 Final	
Engine Configuration	Inline 4	
Bore	4.1 in	
Stroke	5 in	
Displacement	268.5 in^3	
Compression Ratio	16.5:1	
Aspiration	Turbocharged Aftercooled (TA) or Series Turbocharged Aftercooled (TTA)	
Combustion System	Direct Injection	
Rotation from Flywheel End	Counterclockwise	
Aftertreatment	DOC+SCR or DOC+DPF+SCR	

Length	33.3 in
Width	29.1 in
Height	34.1 in
Weight - Net Dry - Basic Operating Engine Without Optional Attachments	926 lb

Length	26.5 in
Width	18.8 in
Height	15.3 in
Weight	99 lb

Diameter	10.6 in

C4.4 STANDARD EQUIPMENT

C4.4 STANDARD EQUIPMENT

AIR INLET SYSTEM

Standard air cleaners

CONTROL SYSTEM

Full electronic control system, all connectors and wiring looms waterproof and designed to withstand harsh off-highway environments
Flexible and configurable software features and well-supported SAE J1939 CAN bus enables highly integrated machines

COOLING SYSTEM

Top tank temperature 108° C (226° F) as standard to minimize cooling pack size
50:50 water glycol mix

FLYWHEELS AND FLYWHEEL HOUSING

Wide choice of drivetrain interfaces, including SAE No. 2 and SAE No. 3 configurations

FUEL SYSTEM

Electronic high pressure common rail
Innovative filter design to ensure maximum protection of the engine

LUBE SYSTEM

Wide choice of sumps for different applications

POWER TAKE OFF

SAE A and SAE B flanges on left-hand side. Additional SAE A flange available on left-hand side. Engine power can also be taken from the front of the engine on some applications. Factory fitted compressors are also available.

GENERAL

Available with or without a balancer
Paint: Caterpillar yellow, with optional colors available at request

U.S. EPA TIER 4 INTERIM EQUIVALENT, EU STAGE IIIB EQUIVALENT AFTERTREATMENT / CLEAN EMISSIONS CONTROL EQUIPMENT

Clean Emissions Module (CEM), consisting of Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC)
No ash service requirement
Passive regeneration

U.S. EPA TIER 4 FINAL, EU STAGE IV AFTERTREATMENT/ CLEAN EMISSIONS CONTROL EQUIPMENT

Clean Emissions Module (CEM), consisting of Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC)
Selective Catalytic Reduction (SCR)
3" flex pipe connection with straight, 45°, and 90° options for flexibility

Attachment B

Reference Data Used To Estimate Emissions From Steam Enhanced Extraction (SEE) System

Average Concentration of Soil VOCs in Public Works Yard (mg/kg)

1,1,1,2-Tetrachloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	4-Chlorotoluene	Acetone	Benzene	Chloroform	Cymene (p-Isopropyltoluene)	Dichloromethane (Methylene chloride)	Ethanol	Ethylbenzene	Isopropylbenzene (Cumene)	Methyl tert-Butyl Ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	Toluene	Xylenes (total)
ND	69.84	28.30	ND	0.03	1492.3	ND	ND	47.34	6.40	46.11	13.83	87.33	0.01	22.85	15.50	27.27	41.93	7.55

Average Concentration of Groundwater VOCs in Public Works Yard (mg/L)

1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,4-Dioxane	2-Butanone	4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	Acetone	Benzene	Chloromethane	Cymene (p-Isopropyltoluene)	Ethylbenzene	Hexane	Isobutanol (Isobutyl alcohol)	Isopropylbenzene (Cumene)	Methyl tert-Butyl Ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Toluene	Trichloroethene	Xylenes (total)
0.26	0.06	ND	ND	ND	0.01	349.25	0.00	0.00	0.64	0.32	23.68	0.03	1.69	0.00	0.05	0.01	0.05	0.84	0.01	0.00	0.83

SEE Influent Stream Assumptions

% VOC mass that is benzene	80.62%
% VOC mass that is non-benzene	19.38%
% VOC mass that is HAP	91.46%
% VOC mass that is non-HAP (Other VOM)	8.54%
Treatment area benzene mass estimate (lbs)	28,573
Treatment area non-benzene mass estimate (lbs)	6,870
Total Treament Area VOC Mass (lbs)	35,443
HAP mass (lbs)	**32,416**
Other VOM mass (lbs)	**3,027**

Notes/Assumptions:

1. Data are from the 2019 Public Works Yard Predesign Investigation and were used to design the PWY SEE System.
2. Ratio of VOC constituents in soil and groundwater available for steam enhanced extraction is assumed to be the same as in the results of the 2019 PWY Predesign Investigation.
3. ND = Not Detected

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/785-1705

FEDERALLY ENFORCEABLE STATE OPERATING PERMIT

PERMITTEE

Shell Oil Products US
Attn: Leroy Bealer
128 East Center Street
Nazareth, Pennsylvania 18064

Application No.: 12040025 I.D. No.: 119090AAO
Applicant's Designation: Roxana Site Date Received: April 13, 2012
Subject: SVE System with RTO Control
Date Issued: October 5, 2021 Expiration Date: October 5, 2031
Location: WRB Refinery Near Intersection of Chaffer Street and 8th Street, Roxana, Madison County

This permit is hereby granted to the above-designated Permittee to OPERATE emission unit(s) and/or air pollution control equipment consisting of a soil vapor extraction (SVE) system, including steam enhanced extraction (SEE) with boiler, with regenerative thermal oxidizer (RTO) control pursuant to the above-referenced application. This permit is subject to standard conditions attached hereto and the following special condition(s):

1a. This Federally Enforceable State Operating Permit (FESOP) is issued:

i. To limit the emissions of air pollutants from the source to less than major source thresholds (i.e., 100 tons/year for Volatile Organic Material (VOM), 10 tons/year for any single Hazardous Air Pollutant (HAP) and 25 tons/year for any combination of such HAPs). As a result, the source is excluded from the requirements to obtain a Clean Air Act Permit Program (CAAPP) permit. The maximum emissions of this source, as limited by the conditions of this permit, are described in Attachment A.

ii. To establish federally enforceable production and operating limitations, which restrict the potential to emit to less than 10 tons/year for any individual Hazardous Air Pollutant (HAP) and 25 tons/year of any combination of such HAPs so that the source is not subject to the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Site Remediation, 40 CFR 63 Subpart GGGGG.

b. Prior to issuance, a draft of this permit has undergone a public notice and comment period.

c. This permit supersedes all operating permit(s) for this location.

2a. The RTO associated with the SVE system is subject to 35 Ill. Adm. Code Part 212 Subpart B (Visible Emissions). Pursuant to 35 Ill. Adm. Code 212.123(a), no person shall cause or allow the emission of smoke or

other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 Ill. Adm. Code 212.122.

b. Pursuant to 35 Ill. Adm. Code 212.123(b), the emission of smoke or other particulate matter from any such emission unit may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period.

c. This source is subject to 35 Ill. Adm. Code Part 212 Subpart K (Fugitive Particulate Matter). Pursuant to 35 Ill. Adm. Code 212.301, no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source.

3. The RTO associated with the SVE system is subject to 35 Ill. Adm. Code Part 214 Subpart K (Process Emission Sources). Pursuant to 35 Ill. Adm. Code 214.301, except as further provided by 35 Ill. Adm. Code Part 214, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2000 ppm.

4a. The SVE system is subject to 35 Ill. Adm. Code Part 219 Subpart G (Use of Organic Material). Pursuant to 35 Ill. Adm. Code 219.301, no person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 Ill. Adm. Code 219.302, 219.303, 219.304 and the following exception: If no odor nuisance exists the limitation of 35 Ill. Adm. Code Part 219 Subpart G shall apply only to photochemically reactive material.

b. Pursuant to 35 Ill. Adm. Code 219.302(a), emissions of organic material in excess of those permitted by 35 Ill. Adm. Code 219.301 are allowable if such emissions are controlled by one of the following methods:

Flame, thermal or catalytic incineration so as either to reduce such emissions to 10 ppm equivalent methane (molecular weight 16) or less, or to convert 85 percent of the hydrocarbons to carbon dioxide and water.

c. The SVE system is subject to 35 Ill. Adm. Code Part 219 Subpart TT (Other Emission Units). Pursuant to 35 Ill. Adm. Code 219.980(a), the requirements of 35 Ill. Adm. Code Part 219 Subpart TT shall apply to a source's VOM emission units, which are not included within any of the categories specified in 35 Ill. Adm. Code Part 219 Subparts B, E, F, H, Q, R, S, T, V, X, Y, Z, AA, BB, PP, QQ, or RR, or are not exempted from permitting requirements pursuant to 35 Ill. Adm. Code 201.146, if the source is subject to 35 Ill. Adm. Code Part 219 Subpart TT. A source is subject to 35 Ill. Adm. Code Part 219 Subpart TT if it contains

process emission units, not regulated by 35 Ill. Adm. Code Part 219 Subparts B, E, F (excluding 35 Ill. Adm. Code 219.204(l)), H (excluding 35 Ill. Adm. Code 219.405), Q, R, S, T, (excluding 35 Ill. Adm. Code 219.486 of this Part), V, X, Y, Z or BB, which as a group both:

i. Have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

ii. Are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable permit or a SIP revision.

d. Pursuant to 35 Ill. Adm. Code 219.986(a), every owner or operator of an emission unit subject to 35 Ill. Adm. Code Part 219 Subpart TT shall comply with the requirements of 35 Ill. Adm. Code 219.986(a), (b), (c), (d) or (e).

Emission capture and control equipment which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

5. This permit is issued based on the SVE system at this source not being subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Site Remediation, 40 CFR 63 Subpart GGGGG because this source is not a major source of HAP as defined in 40 CFR 63.2. This is a result of the federally enforceable production and operating limitations, which were established in this permit to restrict the potential to emit to less than 10 tons/year for any individual Hazardous Air Pollutant (HAP), and 25 tons/year of any combination of such HAPs.

6. Pursuant to 35 Ill. Adm. Code 212.314, 35 Ill. Adm. Code 212.301 shall not apply and spraying pursuant to 35 Ill. Adm. Code 212.304 through 212.310 and 35 Ill. Adm. Code 212.312 shall not be required when the wind speed is greater than 40.2 km/hr (25 mph). Determination of wind speed for the purposes of 35 Ill. Adm. Code 212.314 shall be by a one-hour average or hourly recorded value at the nearest official station of the U.S. Weather Bureau or by wind speed instruments operated on the site. In cases where the duration of operations subject to 35 Ill. Adm. Code 212.314 is less than one hour, wind speed may be averaged over the duration of the operations on the basis of on-site wind speed instrument measurements.

7a. In the event that the operation of this source results in an odor nuisance, the Permittee shall take appropriate and necessary actions to minimize odors, including but not limited to, changes in raw material or installation of controls, in order to eliminate the odor nuisance.

b. The RTO shall be in operation at all times when the associated SVE system is in operation and emitting air contaminants.

c. The Permittee shall, in accordance with the manufacturer(s) and/or vendor(s) recommendations, perform periodic inspections and maintenance

on the RTO associated with the SVE system such that the RTO is kept in proper working condition and not cause a violation of the Environmental Protection Act or regulations promulgated therein.

d. The RTO's combustion chamber shall be preheated to at least the manufacturer's recommended temperature but no less than the temperature at which compliance was demonstrated in the most recent compliance test, or 1,400°F in the absence of a compliance test. This temperature shall be maintained during operation.

e. The RTO shall only be operated with natural gas as the fuel. The use of any other fuel in the RTO may require that the Permittee first obtain a construction permit from the Illinois EPA and perform stack testing to verify compliance with all applicable requirements.

8a. Emissions from and operation of the SVE/RTO/SEE system not exceed the following limits:

i. VOM emissions:

Maximum VOM Emissions (lbs/Hour)	(Tons/Month)	(Tons/Year)
8.00	2.49	24.90

ii. HAP emissions:

Single HAP Emissions (Tons/Month)	(Tons/Year)	Combined HAP Emissions (Tons/Month)	(Tons/Year)
0.79	7.90	1.99	19.90

These limits are based on compliance with 35 Ill. Adm. Code 219.301, the maximum hours of operation, and emissions shall be calculated using the following equation:

$$\frac{Emissions}{(tons)} = \left[\frac{\begin{array}{c}\text{Total SVE/RTO System Exhaust} \\ \text{Contaminant Concentration (ppmv)} \\ \text{x SVE/RTO System Exhaust Flowrate (scfm)} \\ \text{x 100 lb/lb - Mole} \\ \text{x 60 min/hour}\end{array}}{10^6 \text{ x 387 cu ft/lb - Mole}} \right] x \frac{Hours}{Operated} \div \frac{2000\ \#}{Ton}$$

b. Combined combustion emissions of the SVE/RTO/SEE system shall not exceed the following limits:

Pollutant	Emission Factor (lbs/mmBtu)	Emissions (Tons/Mo)	Emissions (Tons/Yr)
Carbon Monoxide (CO)	0.084	~~0.11~~ 1.05	~~1.~~10 10.5
Nitrogen Oxides (NO_x)	0.10	~~0.13~~ 1.25	~~1.31~~ 12.5
Particulate Matter(PM)	0.0076	~~0.01~~ 0.1	~~0.10~~ 1.0
Sulfur Dioxide (SO_2)	0.0006	~~0.01~~ 0.01	~~0.01~~ 0.1

These limits are based on maximum firing rate of 3.0 mmBtu/hour for the RTO, and 25.106 mmbtu/hour for the SEE system steam boiler; 8,760 hours/year of operation, and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

c. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months.

9a. Pursuant to 35 Ill. Adm. Code 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants:

i. Testing by Owner or Operator. The Illinois EPA may require the owner or operator of the emission source or air pollution control equipment to conduct such tests in accordance with procedures adopted by the Illinois EPA, at such reasonable times as may be specified by the Illinois EPA and at the expense of the owner or operator of the emission source or air pollution control equipment. The Illinois EPA may adopt procedures detailing methods of testing and formats for reporting results of testing. Such procedures and revisions thereto, shall not become effective until filed with the Secretary of State, as required by the APA Act. All such tests shall be made by or under the direction of a person qualified by training and/or experience in the field of air pollution testing. The Illinois EPA shall have the right to observe all aspects of such tests.

ii. Testing by the Illinois EPA. The Illinois EPA shall have the right to conduct such tests at any time at its own expense. Upon request of the Illinois EPA, the owner or operator of the emission source or air pollution control equipment shall provide, without charge to the Illinois EPA, necessary holes in stacks or ducts and other safe and proper testing facilities, including scaffolding, but excluding instruments and sensing devices, as may be necessary.

b. Testing required by Conditions 10 and 11 shall be performed upon a written request from the Illinois EPA by a qualified independent testing service.

10. Pursuant to 35 Ill. Adm. Code 212.110(c), upon a written notification by the Illinois EPA, the owner or operator of a particulate matter emission unit subject to 35 Ill. Adm. Code Part 212 shall conduct the applicable testing for particulate matter emissions, opacity, or visible emissions

at such person's own expense, to demonstrate compliance. Such test results shall be submitted to the Illinois EPA within thirty (30) days after conducting the test unless an alternative time for submittal is agreed to by the Illinois EPA.

11. Pursuant to 35 Ill. Adm. Code 219.988(a), when in the opinion of the Illinois EPA it is necessary to conduct testing to demonstrate compliance with 35 Ill. Adm. Code 219.986, the owner or operator of a VOM emission unit subject to the requirements of 35 Ill. Adm. Code Part 219 Subpart TT shall, at his own expense, conduct such tests in accordance with the applicable test methods and procedures specified in 35 Ill. Adm. Code 219.105.

12a. Pursuant to 35 Ill. Adm. Code 219.105(d)(2)(A)(i), an owner or operator: That uses an afterburner or carbon adsorber to comply with any Section of 35 Ill. Adm. Code Part 219 must use Illinois EPA and USEPA approved continuous monitoring equipment which is installed, calibrated, maintained, and operated according to vendor specifications at all times the control device is in use except as provided in 35 Ill. Adm. Code 219.105(d)(3). The continuous monitoring equipment must monitor the following parameters:

For each afterburner which does not have a catalyst bed, the combustion chamber temperature of each afterburner.

b. Pursuant to 35 Ill. Adm. Code 219.105(d)(2)(B), an owner or operator: Must install, calibrate, operate and maintain, in accordance with manufacturer's specifications, a continuous recorder on the temperature monitoring device, such as a strip chart, recorder or computer, having an accuracy of ± 1 percent of the temperature measured, expressed in degrees Celsius or ± 0.5° C, whichever is greater.

13. Pursuant to 40 CFR 63.10(b)(3), if an owner or operator determines that his or her stationary source that emits (or has the potential to emit, without considering controls) one or more hazardous air pollutants regulated by any standard established pursuant to Section 112(d) or (f) of the Clean Air Act, and that stationary source is in the source category regulated by the relevant standard, but that source is not subject to the relevant standard (or other requirement established under 40 CFR Part 63) because of limitations on the source's potential to emit or an exclusion, the owner or operator must keep a record of the applicability determination on site at the source for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination must be signed by the person making the determination and include an analysis (or other information) that demonstrates why the owner or operator believes the source is unaffected (e.g., because the source is an area source). The analysis (or other information) must be sufficiently detailed to allow the USEPA and/or Illinois EPA to make a finding about the source's applicability status with regard to the relevant standard or other requirement. If relevant, the analysis must be performed in accordance with requirements established in relevant subparts of 40 CFR Part 63 for this purpose for particular categories of stationary sources. If relevant, the analysis should be performed in accordance with USEPA

guidance materials published to assist sources in making applicability determinations under Section 112 of the Clean Air Act, if any. The requirements to determine applicability of a standard under 40 CFR 63.1(b)(3) and to record the results of that determination under 40 CFR 63.10(b)(3) shall not by themselves create an obligation for the owner or operator to obtain a Title V permit.

14. Pursuant to 35 Ill. Adm. Code 212.110(e), the owner or operator of an emission unit subject to 35 Ill. Adm. Code Part 212 shall retain records of all tests which are performed. These records shall be retained for at least three (3) years after the date a test is performed.

15a. Pursuant to 35 Ill. Adm. Code 219.991(a)(2), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 219 Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

On and after a date consistent with Section 219.106 of this Part, or on and after the initial start-up date, the owner or operator of a subject VOM source shall collect and record all of the following information each day and maintain the information at the source for a period of three years:

i. Control device monitoring data.

ii. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

iii. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

16a. The Permittee shall maintain records of the following items so as to demonstrate compliance with the conditions of this permit:

i. Records addressing use of good operating practices for the RTO associated with the SVE system:

A. Records for periodic inspection of the RTO with date, individual performing the inspection, and nature of inspection; and

B. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

ii. Measured exhaust total VOM and HAP (single and combined) contaminant concentration (ppmv) in exhaust air flow samples exhausting the SVE/RTO system. These samples and measurements shall be taken at start-up once every month. The Permittee may measure exhaust total VOM and HAP contaminant concentration (ppmv) in exhaust air using an appropriately calibrated photo or flame ionization detector on a once/month basis.

iii. Exhaust air flow rate (dscfm) from the SVE/RTO system at start-up once every month;

iv. Hours of operation of the system (hours/month, hours/year);

v. Natural gas usage (mmscf/month, mmscf/year); and

vi. Monthly and annual emissions of CO, NO_x, PM, SO_2, VOM, and HAPs from the source with supporting calculations (tons/month and tons/year).

b. All records and logs required by this Condition 16(a) of permit shall be retained at a readily accessible location at the source for at least five (5) years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer storage device) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

17. Pursuant to 35 Ill. Adm. Code 212.110(d), a person planning to conduct testing for particulate matter emissions to demonstrate compliance shall give written notice to the Illinois EPA of that intent. Such notification shall be given at least thirty (30) days prior to the initiation of the test unless a shorter period is agreed to by the Illinois EPA. Such notification shall state the specific test methods from 35 Ill. Adm. Code 212.110 that will be used.

18a. Pursuant to 35 Ill. Adm. Code 219.991(a)(3), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 219 Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

On and after a date consistent with 35 Ill. Adm. Code 219.106, the owner or operator of a subject VOM source shall notify the Illinois EPA in the following instances:

i. Any record showing a violation of the requirements of 35 Ill. Adm. Code Part 219 Subpart PP, QQ, RR or TT shall be reported by sending a copy of such record to the Illinois EPA within 30 days following the occurrence of the violation.

ii. At least 30 calendar days before changing the method of compliance with 35 Ill. Adm. Code Part 219 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 219.991(b)(1). Upon changing the method of compliance with of 35 Ill. Adm. Code Part 219 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 219.991(b).

19a. If there is an exceedance of or a deviation from the requirements of this permit as determined by the records required by this permit or otherwise, the Permittee shall submit a report to the Illinois EPA's Bureau of Air Compliance Section in Springfield, Illinois within thirty (30) days after the exceedance or deviation. The report shall identify the duration and the emissions impact of the exceedance or deviation, a copy of the relevant records and information to resolve the exceedance or deviation, and a description of the efforts to reduce emissions from, and the duration of exceedance or deviation, and to prevent future occurrences of any such exceedance or deviation.

b. Two (2) copies of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

It should be noted that the two (2) 629 gallon water storage tanks are exempt from permitting, pursuant to 35 Ill. Adm. Code 201.146(n).

If you have any questions on this permit, please contact Jocelyn Stakely at 217/785-1705.

William D. Marr
Manager, Permit Section
Bureau of Air

WDM:JRS:tan

Attachment A - Emission Summary

This attachment provides a summary of the maximum emissions from the SVE system operating in compliance with the requirements of this federally enforceable permit. In preparing this summary, the Illinois EPA used the annual operating scenario which results in maximum emissions from such a plant. The resulting maximum emissions are below the levels, (e.g., 100 tons/year for VOM, 10 tons/year for any single HAP, and 25 tons/year for any combination of such HAP) at which this source would be considered a major source for purposes of the Clean Air Act Permit Program. Actual emissions from this source will be less than predicted in this summary to the extent that less material is handled, and control measures are more effective than required in this permit.

	E M I S S I O N S (Tons/Year)						
Emission Unit	CO	NO_x	PM	SO_2	VOM	Single HAP	Combined HAPs
SVE System with RTO	~~1.10~~ 10.5	~~1.31~~ 12.5	~~0.10~~ 1.0	~~0.01~~ 0.1	24.90	7.90	19.90

JRS:tan

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR OPERATING PERMITS

May, 1993

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. The issuance of this permit does not release the Permittee from compliance with state and federal regulations which are part of the Illinois State Implementation Plan, as well as with other applicable statutes and regulations of the Unites States or the State of Illinois or with applicable local laws, ordinances and regulations.

2. The Illinois EPA has issued this permit based upon the information submitted by the Permittee in the permit application. Any misinformation, false statement or misrepresentation in the application shall be grounds for revocation under 35 Ill. Adm. Code 201.166.

3. a. The Permittee shall not authorize, cause, direct or allow any modification, as defined in 35 Ill. Adm. Code 201.102, of equipment, operations or practices which are reflected in the permit application as submitted unless a new application or request for revision of the existing permit is filed with the Illinois EPA and unless a new permit or revision of the existing permit(s) is issued for such modification.

   b. This permit only covers emission sources and control equipment while physically present at the indicated plant location(s). Unless the permit specifically provides for equipment relocation, this permit is void for an item of equipment on the day it is removed from the permitted location(s) or if all equipment is removed, notwithstanding the expiration date specified on the permit.

4. The Permittee shall allow any duly authorized agent of the Illinois EPA, upon the presentation of credentials, at reasonable times:

   a. To enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit;

   b. To have access to and to copy any records required to be kept under the terms and conditions of this permit;

   c. To inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit;

   d. To obtain and remove samples of any discharge or emission of pollutants; and

   e. To enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring or recording any activity, discharge or emission authorized by this permit.

5. The issuance of this permit:

   a. Shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are located;

b. Does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the facilities;

c. Does not take into consideration or attest to the structural stability of any unit or part of the project; and

d. In no manner implies or suggests that the Illinois EPA (or its officers, agents, or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. The facilities covered by this permit shall be operated in such a manner that the disposal of air contaminants collected by the equipment shall not cause a violation of the Environmental Protection Act or regulations promulgated thereunder.

7. The Permittee shall maintain all equipment covered under this permit in such a manner that the performance of such equipment shall not cause a violation of the Environmental Protection Act or regulations promulgated thereunder.

8. The Permittee shall maintain a maintenance record on the premises for each item of air pollution control equipment. These records shall be made available to any agent of the Environmental Protection Agency at any time during normal working hours and/or operating hours. At a minimum, this record shall show the dates of performance and nature of preventative maintenance activities.

9. No person shall cause or allow continued operation during malfunction, breakdown or startup of any emission source or related air pollution control equipment if such operation would cause a violation of an applicable emission standard or permit limitation. Should a malfunction, breakdown or startup occur, which results in emissions in excess of any applicable standard or permit limitation, the Permittee shall:

   a. Immediately report the incident to the Illinois EPA's Regional Field Operations Section Office by telephone, telegraph or other method as constitutes the fastest available alternative, and shall comply with all reasonable directives of the Illinois EPA with respect to the incident;

   b. Maintain the following records for a period of no less than two (2) years:

      i. Date and duration of malfunction, breakdown, or startup,

      ii. Full and detailed explanation of the cause,

      iii. Contaminants emitted and an estimate of quantity of emissions,

      iv. Measures taken to minimize the amount of emissions during the malfunction, breakdown or startup, and

      v. Measures taken to reduce future occurrences and frequency of incidents.

10. If the permit application contains a compliance program and project completion schedule, the Permittee shall submit a project completion status report within thirty (30) days of any date specified in the compliance program and project completion schedule or at six month intervals, whichever is more frequent.

11. The Permittee shall submit an Annual Emission Report as required by 35 Ill. Adm. Code 201.302 and 35 Ill. Adm. Code Part 254.