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Parkersburg, WV 26101

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1800 Main Street, Suite 200
Canonsburg, PA 15317

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August 20, 2025

Edward S. Andrews
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, West Virginia 25304
edward.s.andrews@wv.gov

E-MAIL

Re: Clean Seas West Virginia Inc.
Application for NSR Permit And
Title V Permit Revision

Dear Mr. Andrews:

Attached for filing on behalf of Clean Seas West Virginia Inc., please find the Application for NSR Permit and Title V Permit Revision.

If you have any questions regarding this filing, please contact me.

Very truly yours,

Marc Mignault

MM:tlp
Attachments
cc: Samantha N. Blair (via e-mail)

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : Clean-Seas West Virginia Inc, Belle

[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only):
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only):

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Revision (if any)**:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Update
  - ☐ Minor Modification
  - ☐ Significant Modification
  - ☐ Off Permit Change

****If any box above is checked, include the Title V revision information as ATTACHMENT S to this application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)

    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Dan Bates
    - Email: dan@clean-seas.com
    - Phone Number: 310-387-7636
  - ☑ Company Contact
    - Name: John Yonce
    - Email: john.yonce@clean-seas.com
    - Phone Number: 617-922-0076
  - ☑ Consultant
    - Name: Roger Hanshaw
    - Email: rhanshaw@bowlesrice.com
    - Phone Number: 304-347-1100

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Clean-Seas West Virginia Inc.

2. Federal Employer ID No. ***(FEIN):***
92-3247592

3. Name of facility *(if different from above):*

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
2700 E Dupont Ave, Ste 3B
Belle WV 25015

5B. Facility's present physical address:
2700 E Dupont Ave Ste 3B
Belle WV 25015

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Clean-Seas Inc.

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: 20 year lease, commencing March 1 2025

- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Plastics Pyrolysis Plant

10. North American Industry Classification System **(NAICS)** code for the facility:
325199

11A. DAQ Plant ID No. (for existing facilities only):
–

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From US Rte 60, turn SOUTH onto Warrior Way.
Turn EAST on E Dupont Ave.
In approx.. 400 feet, turn NORTH into existing parking lot at 2700 E Dupont Ave

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
2700 E Dupont Ave	Belle	Kanawha
12.E. UTM Northing (KM): 1822380.411	12F. UTM Easting (KM): 440427.769	12G. UTM Zone: 17n

13. Briefly describe the proposed change(s) at the facility:
A plastics conversion plant will be constructed at the site of a lumber sales building. This work includes a delivery dock, preprocessing, pyrolysis of plastic, pyrolysis oil loading into trucks, oil storage in frac tanks, a flare, backup generator, offices, a baghouse for recovery of airborne plastic and parking.

14A. Provide the date of anticipated installation or change: Oct 1 2025 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: Nov 1 2025

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☒ **YES** ☐ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

■ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
■ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	■ Storage Tanks
☐ Grey Iron and Steel Foundry	■ Indirect Heat Exchanger	

■ General Emission Unit, specify: Plastics Pyrolysis units (2) and a Flare

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	■ Flare
☐ Adsorption Systems	■ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ DATE: 08/08/25

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Daniel Bates		35C. Title: CEO
35D. E-mail: Dan@clean-seas.com	36E. Phone: 310-387-7636	36F. FAX:
36A. Printed name of contact person (if different from above): Roger Hanshaw		36B. Title: Attorney
36C. E-mail: rhanshaw@bowlesrice.com	36D. Phone: 304-347-1100	36E. FAX: 304-343-2867

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☒ Attachment B: Map(s)
- ☒ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☐ Attachment H: Material Safety Data Sheets (MSDS)
- ☒ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☒ Attachment L: Emissions Unit Data Sheet(s)
- ☒ Attachment M: Air Pollution Control Device Sheet(s)
- ☐ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☐ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
CLEAN-SEAS WEST VIRGINIA, INC.
600 QUARRIER ST
CHARLESTON, WV 25301-0000

BUSINESS REGISTRATION ACCOUNT NUMBER: **2444-1316**

This certificate is issued on: **04/03/2023**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.
This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.19
L0014154528

LEGEND

- SURVEYED LEASE LINE
- TRACT LINE
- OTHER PROPERTY LINES
- SURVEYED TIE LINE
- EASEMENT LINE
- RIGHT OF WAY
- STREAM/DITCH
- EXISTING FENCE LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATER LINE
- EXISTING GAS LINE
- OVERHEAD ELECTRIC
- OVERHEAD TELEPHONE
- OVERHEAD CABLE
- OVERHEAD ELECTRIC/CABLE
- OVERHEAD ELECTRIC/CABLE/TELEPHONE
- OVERHEAD ELECTRIC/TELEPHONE
- OVERHEAD CABLE/TELEPHONE
- 5/8" REBAR WITH CAP SET
- FOUND MONUMENTATION
- CALCULATED POINT
- EXISTING FIRE HYDRANT
- EXISTING WATER OR GAS METER
- EXISTING WATER OR GAS VALVES
- TELEPHONE OR ELECTRIC RISER
- UTILITY POLE
- GUY WIRE
- LIGHT POLE
- EXISTING BUILDING

LEGAL DESCRIPTION

A 9.04 ACRE +/- LEASE PARCEL, LOCATED AT QUINCY CENTER, ON THE WATERS OF KANAWHA RIVER, CABIN CREEK DISTRICT, KANAWHA COUNTY, WEST VIRGINIA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CHAINLINK FENCE CORNER LOCATED ON THE NORTHEAST SIDE OF MALL ROAD, COMMON CORNER TO AN ACCESS EASEMENT PARCEL FOR THE BENEFIT OF TRACTOR SUPPLY STORE;

THENCE WITH SAID ACCESS EASEMENT PARCEL FOR THE FOLLOWING TWO COURSES AND DISTANCES:
(1) N48°15'03"E 150.98 FEET TO A CHAINLINK FENCE POST;
(2) N42°45'07"W 96.56 FEET TO A CHAINLINK FENCE POST, COMMON CORNER TO TRACTOR SUPPLY LEASE PARCEL (LB. 261 PG. 117);

THENCE LEAVING SAID ACCESS EASEMENT PARCEL AND WITH THE COMMON LINE OF SAID TRACTOR SUPPLY LEASE,
N47°42'22"E 245.50 FEET, TO A 5/8" REBAR AND CAP SET IN THE SOUTHERLY C.A. RIGHT OF WAY LINE OF U.S. ROUTE 60, SAID POINT BEING LOCATED 203.75 FEET RIGHT OF SAID CENTERLINE STATION 524+64.32;

THENCE WITH SAID RIGHT OF WAY FOR THE FOLLOWING THREE COURSES AND DISTANCES:

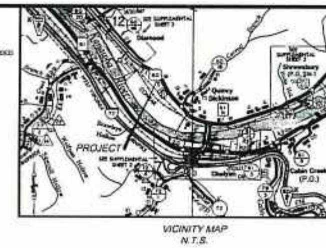
(1) S45°28'18"E 521.43 FEET TO A 5/8" REBAR AND CAP SET, SAID POINT BEING LOCATED 200 FEET RIGHT OF SAID CENTERLINE STATION 530+00;
(2) S39°59'57"E 363.54 FEET TO A 5/8" REBAR AND CAP SET, SAID POINT BEING LOCATED 210.48 FEET RIGHT OF SAID CENTERLINE STATION 533+73.46;
(3) S58°19'47"E 95.48 FEET TO A 5/8" REBAR AND CAP SET, SAID POINT BEING LOCATED 180.30 FEET RIGHT OF SAID CENTERLINE STATION 534+66.42;

THENCE LEAVING SAID C.A. RIGHT OF WAY AND THROUGH THE LANDS OF QUINCY CENTER FOR THE FOLLOWING THREE COURSES AND DISTANCES:

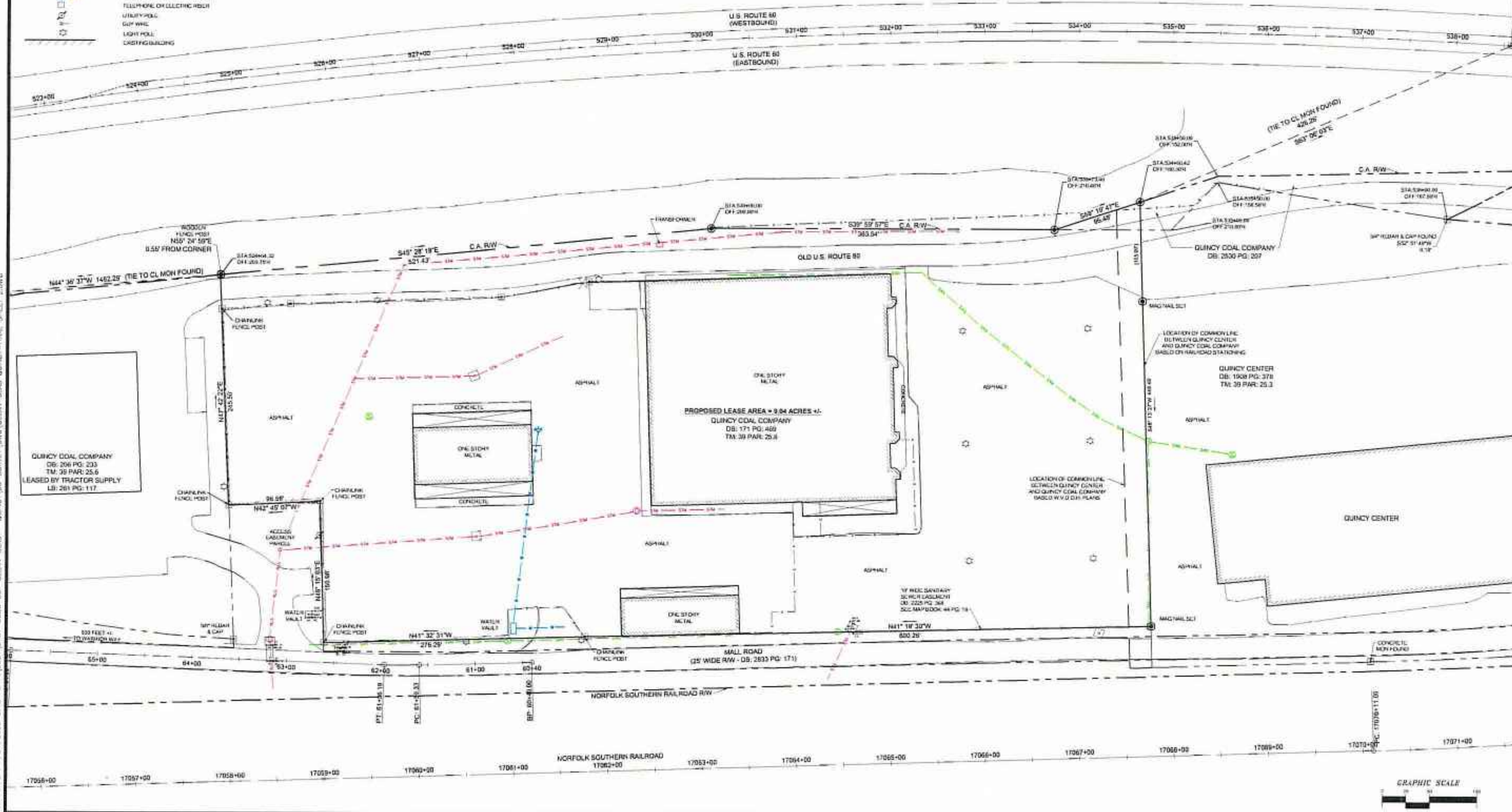
(1) S48°13'27"W, PASSING A MAG NAIL SET IN ASPHALT AT 105.00 FEET, IN ALL 449.49 FEET TO A MAG NAIL SET IN ASPHALT;
(2) N41°18'30"W 600.28 FEET TO A CHAINLINK FENCE POST;
(3) N41°32'31"W 276.29 FEET TO THE PLACE OF BEGINNING, CONTAINING 9.04 ACRES, MORE OR LESS, AS SURVEYED BY TERRADON CORPORATION.

REFERENCES

1) WVDOH STATE PROJECT # [illegible]
2) NORFOLK SOUTHERN VAL MAP V. [illegible]
3) PLAT OF SURVEY BY [illegible] ENGINEERING DATED APRIL [illegible], 19[illegible], RECORDED IN DEED BOOK 1908 PAGE 3[illegible].



VICINITY MAP
N.T.S.



U.S. ROUTE 60 (WESTBOUND)
U.S. ROUTE 60 (EASTBOUND)
OLD U.S. ROUTE 60
(TIE TO CL MON FOUND) 426.26' S63° 06' 03"E
N44° 36' 37"W 1482.29' (TIE TO CL MON FOUND)
S45° 28' 18"E 521.43'
S39° 59' 57"E 363.54'
S58° 19' 47"E 95.48'
C.A. R/W
N47° 42' 22"E 245.50'
N42° 45' 07"W 96.56'
N48° 15' 03"E 150.98'
N41° 32' 31"W 276.29'
N41° 18' 30"W 600.28'
S48° 13' 27"W 449.49'
PROPOSED LEASE AREA = 9.04 ACRES +/-
QUINCY COAL COMPANY
DB: 171 PG: 469
TM: 39 PAR: 25.6
QUINCY COAL COMPANY
DB: 256 PG: 233
TM: 39 PAR: 25.6
LEASED BY TRACTOR SUPPLY
LB: 261 PG: 117
QUINCY CENTER
DB: 1908 PG: 378
TM: 39 PAR: 25.3
QUINCY COAL COMPANY
DB: 2530 PG: 207
QUINCY CENTER
ONE STORY METAL
CONCRETE
ASPHALT
TRANSFORMER
ACCESS EASEMENT PARCEL
CHAINLINK FENCE POST
WOODEN FENCE POST
MAG NAIL SET
WATER VAULT
MALL ROAD
(25' WIDE R/W - DB: 2533 PG: 171)
NORFOLK SOUTHERN RAILROAD R/W
NORFOLK SOUTHERN RAILROAD
GRAPHIC SCALE

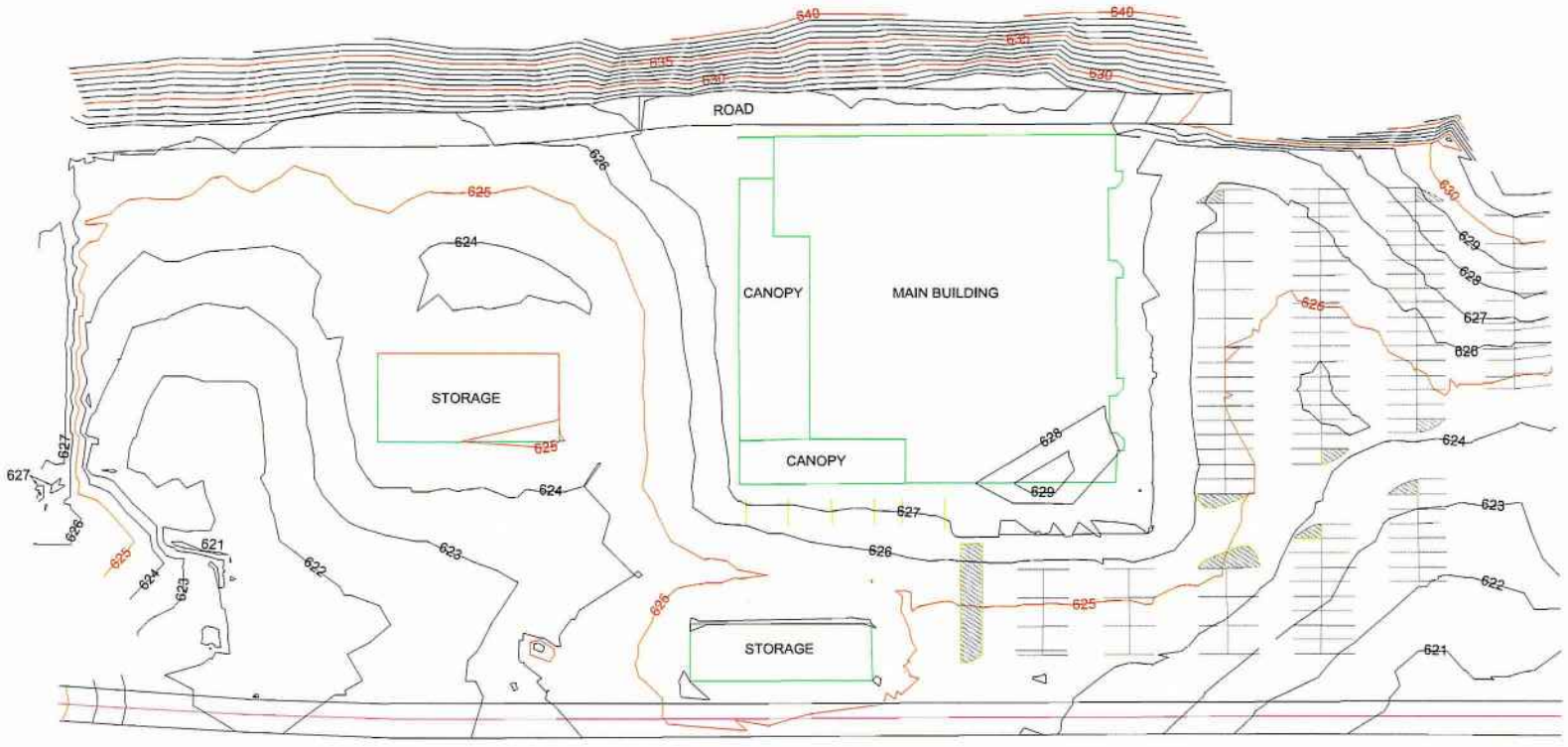
PLAT OF SURVEY
SHOWING A NEW 9.04 ACRE+/- LEASE PARCEL

BEING A PART OF QUINCY COAL COMPANY
CABIN CREEK DISTRICT, KANAWHA COUNTY, WV

TERRADON
Engineering • Surveying • Land Planning
Testing & Inspection
(304) 755-8291 www.terradon.com

Project No.	2401-3636-001
Drawn	DAB
Checked	MCS
Approved	DAB
Scale	1"=50'
Date	1-21-25
CAD File #	CLEAN SEAS

S1



KANAWHA COUNTY
WEST VIRGINIA

NEW RIVER ENGINEERS, INC

CADD FILE: 363-01-CLEAN SEAS
DRAWN BY: BMS
CHECKED BY: NPR
DATE: 07/22/2025
SCALE: 1:40

CLEAN SEAS
2711 NORTH SEPULVEDA BLVD,
SUITE 1051 MANHATTAN BEACH,
CA 90266

NEW RIVER ENGINEERS, INC.

SHEET NUMBER:
PAGE 1 OF 1
JOB NO. : 363-01

Clean Seas West Virginia

Attachment C – Installation and Start-Up Schedule

The sources described in this application will be installed at the facility and start-up will occur as soon as possible. However, the schedule is entirely dependent on the availability of equipment from the manufacturers. It is anticipated that the entire facility may begin operating in 2025 or 2026, but this is subject to change.

Attachment "D"
Clean Seas Facility
Regulatory Discussion

The regulatory Discussion reviews the federal and West Virginia regulations potentially applicable to the proposed Clean Seas Facility in Kanawha County, West Virginia, owned and operated by Clean Seas West Virginia LLC.

- D.0 Federal Regulations

- D.01 Prevention of Signification
  - D.01.01 Prevention of Significant Deterioration (40 CFR Part 51)
  - D.01.02 Nonattainment New Source Review (40 CFR Part 51)

- D.02 New Source Performance Standards (40 CFR Part 60)
  - D.02.01 NSPS — 40 CFR Part 60 — Subpart CCCC and DDDD Standards of Performance and Emission Guidelines and Compliance for Commercial and Industrial Solid Waste Incineration Units

- D.03 National Emission Standards for Hazardous Air Pollutants (40 CFR 63)

- D.04 Chemical Accident Prevention (40 CFR 68)

- D.05 State Operating Permit Program (40 CFR 70)

- D.06 Mandatory Greenhouse Gas Reporting (40 CFR 98)

- D.07 Maximum Achievable Control Technology (MACT) applicability

- D.08 Risk Management Plan

- D.09 Stack height

- D1.0 West Virginia State Regulations

  - D1.01 45CSR10 — To Prevent and Control Air Pollution from Emission of Sulfur Oxides https://dep.wv.gov
  - D1.02 45CSR13 — Permits for Construction

- D2.0 Insignificant Activities.

D.0 Federal Regulations

The Code of Federal Regulations (CFR) are regulations adopted by the US EPA and published in the Federal Register pursuant to the authority of the grant by Congress in the Clean Air Act. The CFR addresses multiple aspects, including but not limited to, permitting requirements, performance standards, testing methods, and monitoring requirements. The (CFR's) may be viewed online.

D.01 Prevention of Significant Deterioration Determination

The Prevention of Significant Deterioration (PSD) permitting program is a Clean Air Act permitting program for new and modified major stationary sources of air pollution. Implementation of the federal PSD regulations is delegated to the state of West Virginia by U.S. EPA and these regulations are contained at 40 CFR Part 52.21. Therefore, BAPC implements the federal PSD regulations directly. These regulations specify federally required permitting procedures for each "major stationary source." The PSD regulations define a "stationary source" as "any buildings, structure, facility or installation which emits or may emit any air pollutant subject to regulation under the Act." A building structure facility or installation" is defined as "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of ant vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same `Major Group' (i.e., which have the same first two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement."

"Major" is defined as the potential to emit of a stationary source, which equal or exceeds a specified threshold (in tons per year) or any air pollutants regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutants and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year of any regulated NSR pollutant (see 40 CFR 52.21(b)(1)(i)9b)). The Clean-Seas facility is not a major source as defined by PSD.

D.01.01 Prevention of Significant Deterioration (40 CFR 51)

Prevention of Significant Deterioration (PSD) applies to all criteria pollutants in an area that has been designated as attainment, such as the city of Belle, WV. The PSD program is set forth in 40 CFR 51 and is part of the federal New Source Review (NSR) permitting program for pollutants in an attainment area. Potential emissions of each PSD pollutant are below the program threshold; therefore, federal PSD review does not apply.

D.01.02 Nonattainment New Source Review (40 CFR Part 51)

Nonattainment New Source Review (NNSR) applies to major stationary sources located in nonattainment areas. The proposed plant will be located in Kanawha County, which is currently in attainment for all pollutants. Therefore, NNSR does not apply.

D.02 New Source Performance Standards (40 CFR Part 60)

Section 111 of the Clean Air Act, Standards of performance for New Stationary Sources, (NSPS) requires US EPA to establish federal emission standards for source categories which cause or contribute significantly to air pollution. Each NSPS defines the facilities subject to these requirements and prescribes emission limits for specific pollutants, compliance requirements monitoring requirements and test methods and procedures. These standards are intended to promote use of best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements. These standards apply to sources which have been constructed or modified since the proposal of the standard. These standards can be found in the CFR at Title 40 (Protection of Environment), Part 60 (Standards of Performance for New Stationary Sources).
Generally, state and local air pollution control agencies are responsible for implementation, compliance assistance, and enforcement of the NSPS. US EPA retains concurrent enforcement authority and is also available to provide technical assistance when a state of local agency seeks help. US EPA also retains a few of the NSPS responsibilities such as the ability to approve alternative monitoring methods to maintain a minimum level of national consistency.
There are several federal and state regulations that apply to new source constructed and operating in an attainment area such as "Other Solid Waste Incineration Units" (OSWI) or "Commercial and Industrial Solid Waste Incineration Units" (CISWI). Brief overviews of these requirements are listed in subsections that follows. The Clean Air Act of 1970 directed US EPA to establish new source performance standards for specific industrial categories. There are few NSPS applicable to this project.

D.02.01 NSPS — 40 CFR Part 60 Subparts CCCC and DDDD — Standards of Performance and Emission Guidelines and Compliance for Commercial and Industrial Solid Waste Incineration Units

Clean-Seas is subject to Subparts CCCC and DDDD as a Commercial and Industrial Solid Waste Incineration Unit.

Commercial and industrial solid waste incineration unit (CISWI) means any distinct operating unit of any commercial or industrial facility that combusts, or has combusted in the preceding 6 months, any solid waste as that term is defined in 40 CFR part 241. If the operating unit burns materials other than traditional fuels as defined in § 241.2 that have been discarded, and you do not keep and produce records as required by § 60.2740(u), the operating unit is a CISWI. While not all CISWIs will include all of the following components, a CISWI includes, but is not limited to, the solid waste feed system, grate system, flue gas system, waste heat recovery equipment, if any, and bottom ash system. The CISWI does not include air pollution control equipment or the stack. The CISWI boundary starts at the solid waste hopper (if applicable) and extends through two areas: The combustion unit flue gas system, which ends immediately after the last combustion chamber or after the waste heat recovery equipment, if any; and the combustion unit bottom ash system, which ends at the truck loading station or similar equipment that transfers the

ash to final disposal. The CISWI includes all ash handling systems connected to the bottom ash handling system.

Despite the applicability Subparts CCCC and DDDD and Clean-Seas units being determined to be CISWI units, Clean-Seas notes that the units do not utilize combustion in any way. The primary product from the facility, Plastic Pyrolysis Oil, is a marketable product. The syngas generated in the facility has sufficient BTU content to power the process, and the remaining residue is expected to have commercial applications as well, and the facility is therefore not subject to regulation as an industrial incinerator.

Clean-Seas Minor Source Construction Permit Application

Clean-Seas is proposing to construct and operate a Plastic Pyrolysis Plant.
The proposed Clean-Seas facility will convert plastic to plastic pyrolysis oil (PPO) as a precursor to new plastic and ultra-low sulfur fuels, lubricants, and other products.

Plastic Feedstock Specifications

Clean-Seas only accepts feedstock that: (1) is plastic derived from industrial, commercial, agricultural, or other such activities; (2) is not mixed with solid waste or hazardous waste onsite or during processing at the facility; (3) is intended use as a feedstock for the manufacturing of plastic and chemical feedstocks, other basic hydrocarbons, raw materials, or other intermediate products or final products using advanced recycling; and (4) has been sorted from solid waste and other regulated waste but may contain residual amounts of solid waste such as organic material and incidental contaminants or impurities (e.g., paper labels and metal rings).

The feedstock is typically items made of polyethylene (LDPE, LLDPE, or HDPE) and polypropylene (PP) such as containers, trays, cups, films, and bags.

All items free of contents or free flowing liquids and rinsed.

Minimum 85% polyethylene or polypropylene

Maximum moisture content: 7%

D.03 National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 63)

The NESHAPs contained in 40 CFR 63 have been adopted by the USEPA to regulate hazardous air pollutants via industrial controls. There are no sources at the proposed facility which will be subject to these standards.

D.04 Chemical Accident Prevention (40 CFR Part 68)

The facility does not have more than a threshold quantity of the chemicals listed in this subpart;

therefore, this regulation does not apply.

D.05 State Operating Permit Programs (40 CFR 70)

West Virginia's Operating Permit Program applies to major sources of criteria pollutants or hazardous air pollutants. The proposed facility is below both of these thresholds and is not subject to this regulation.

D.06 Mandatory Greenhouse Gas Reporting (40 CFR 98)

The proposed facility is subject to greenhouse gas reporting in accordance with 40 CFR 98.2(a)(3). Specifically, all three of the conditions in this section have been met:

- The facility will meet the requirements of either 40 CFR 98.2(a)(1) or (a)(2).
- The aggregate maximum rated heat input capacity of the stationary fuel combustion units at the facility is 8 MMBTU/hr or greater.
- The facility emits 25,000 metric tons CO2e or more per year in combined emissions from all stationary fuel combustion sources.

D.07 Maximum Achievable Control Technology Standards

Maximum Achievable Control Technology (MACT) Standards were established under Section 112 of Clean Air Act for control of hazardous air pollutants ("HAPs"). These MACT standards are specified based on the category and subcategory list applicable to the major source. A minor source of HAPs is a source with total predicted HAP emissions of 25 TPY or greater or any single HAP emissions equal to 10 TPY or greater.

MACT Applicability

Predicted HAP emissions from the Clean-Seas' Plant are less than 25 tons per year total and less than 10 tons per year of any single HAP, hence Clean-Seas is not defined as a major source of HAPs.

D.08 Risk Management Plan

40 CFR 68 requires that Risk Management Plan (RMP) be developed for any regulated substance in excess of the threshold quantity as defined in subpart F. The Clean-Seas Plant does not have any regulated substance in excess of threshold limit.

D.09 Stack Height

The stack height regulations promulgated by U.S. EPA on July 8, 1985 (50 FE27892), established a stack height limitation to assure that stack height increases, and other plume dispersion techniques would not be used in lieu of constant emission controls. These regulations apply to facilities that commenced construction after December 31, 1970, and to dispersion techniques implemented after that date. These federal requirements have been included in the

regulations for Good Engineering Practice Stack Height. The regulations specify that Good Engineering Practice (GEP) stack height is the maximum creditable stack height a source may use in establishing its applicable State Implementation Plan (SIP) emission limitation. A GEP stack height means the greater of one of the following two options:

1. 65 meters, measured from ground-level elevation at the base of the stack (deminimus stack height); or
2. For stacks uninfluenced by terrain features, the determination of GEP stack height for a source is based on the following empirical equation:

   $Hg = H + H + 1.5Lb$

   Where: Hg = GEP stack height;
   H = Height of the structure on which the source is located, or nearby structure; and
   Lb = Lesser dimension (height or width) of the structure on which the source is located, or nearby structure.

Both the height and width of the structure are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. The area where a nearby structure can have significant influence on the source is limited to 5 times the lesser dimension (height or width) of that structure or within 0.5 mile (0.8 km) of the proposed stack, whichever is less. The methods for determining GEP stack height for various building configurations have been described in U.S. EPA's technical support document (U.S. EPA, 1985).

All stacks at Clean-Seas Plant are less than 65 meters in height.

D1.0 State Regulations

In addition to the federal air permitting requirements, the WVDEP applicable air quality regulations are summarized in this section.

The West Virginia Air Quality Standards and Regulations (DAQ) contains all state regulations applicable to the proposed site. All new or modified emission sources that are not specifically exempt from permitting requirements must obtain a construction and operating permit from the State of West Virginia Department of Environmental Protection Division of Air Quality prior to commencing construction and/or operation. This application and attached forms fulfill the information requirements needed to obtain a construction and operating permit required by regulation. Applicable sections include:

D1.01 45CSR10: Emission of Sulfur Dioxide

Clean-Seas' Plastic Pyrolysis System will burn the synthetic gas generated by, and powering, the pyrolysis reactor. The unit will use natural gas and propane. Both of these fuels have odorant for the purpose of leak detection. The quantities of SO2 from these sources is very low and below

reportable quantities. Plastic materials used as feedstock for the plant will be selected for low chemical content as such S emissions generating SO2 will be minor.

D1.02 45CSR13: "Minor New Source" Permit for Construction

Review permitting is divided into three categories:

1. NSR (45CSR13) Preconstruction Permit — See Table 9.4 for pollutant
   NSR (45CSR13) Preconstruction — Requirements
   This is an existing infrastructure previously used for sales and storage of lumber and construction materials.
   Clean-Seas' Facility will meet all requirements as per NSR (45CSR13) See WVDEP 45CSR 13 Table 13A Revised and Table 1313 as well as Table 9.4.

   All potential TAP and HAP emissions as listed in table 45-13A are calculated and included with this application. See permit application and attachments as listed under NSR (CSR13)
   Respective Air Pollution for HAPs and TAPs See tables 9.4.1, 9.4.1A, 9.4.2 & 9.4.2A
2. 45CSR13 — Hazardous Air Pollution (HAP)
3. 45CSR13 — Toxic Air Pollution (TAP)

West Virginia Minor Source Air Permitting Program is enacted through 45CSR13 in which air Toxins are addressed in 45CSR 13. Any source that proposes to have the potential to emit before control at or above 2 lb/hr or 5 tpy of TAPs considered on aggregated basis for new facility. Clean-Seas will meet the necessary requirements. The EPA has determined that the following units do not require stringent regulations under Part 266, Subpart H.

1.0 Units burning gas recovered from hazardous or solid waste.
2.0 Units burning hazardous waste exempt from regulation 216.6(a)(s))iii)-v and maybe from 261.5
3.0 Applicability and exemptions, there are two classes of units covered under the Part 266, Subpart H. Regulation — Boilers and Industrial Furnaces. EPA defines a boiler as an enclosed device that uses controlled flame combustion to recover and export energy in the form of steam. Boilers have a combustion chamber and energy recovery efficiency of 60 percent. Reference RCRA, 40 CFR Part 266H — Boilers and Industrial Furnaces.

Emissions from Clean-Seas Operation — Attachments 'N' for all tables starting with No. 9.

a) Table 9.4 — Emission Factors/Emission Calculations Note 1 Attachment N
b) Tables 9.4.1, 9.4.1A, 9.4.2 & 9.4.2A — Emission Summary (Section 9.0)
c) Table 9.4.3 — Metals and Other Emission Factors/Emission (Section 9.0)
d) TAP & HAP Emission Summary (Section 9.0)
   Organic HAPs Emission Summary (Section 9.0)
e) Table 9.4.5 - Hazardous Air Pollutants Summary (Section 9.0)

Including Metallic HAPs Summary

3.0 Emergency Generator (Section 9.0) Subsection 9.6.2
Generac 150 kw (Attachments I & J)

1.0 Basic Operations & Process Description

Pre-approved plastic feedstock will arrive on the site via semi-trailer trucks and small box trucks. The plastic will be shipped in properly secured gaylord boxes, sacks or bales. The feedstock will be directly unloaded into the facility building. Once inside, the contents are unpacked, and prepared for processing.

The feedstock is manually fed into the American Renewable Technologies Inc. (ARTI) pyrolysis system, designed to operate on a continuous basis except for controlled, planned shutdowns.

2.0 Emissions:

Emission from the following emission units

Emission Unit I.D.	Description	Points
1-S	Pyrolyzer Unit 1	1-E
2-S	Pyrolyzer Unit 2	2-E
3-S	Flare	3-E
4-S	Frac Tanks	4-E
5-S	Generator-backup	5-E
6-S	Truck Loading	6-E
IR	Paved Roads	IR-E

APCD	Description
1C	Pyrolysis Unit 1 Burner
2C	Pyrolysis Unit 2 Burner
3C	Flare

These air pollution components have been selected and arranged to provide targeted and redundant levels of removal for the "nine pollutants" of concern specified the Table 1B of 40 CFR part EC, for which Clean-Seas is not subject to, but are using for reference. These controls include Low NOx Burners (NOx control), and Flare to control emissions.

3. 5-EG5 — Emergency Natural Gas Generator Unit (ID 5-EG5)

Emergency generator will be a Generac 150kWh natural gas generator and provide power during emergency events. The generator will be permitted for 100 hours per year for non-emergency uses including maintenance and upkeep activities.

D2.0 Insignificant Activities Exempt from Permitting

Certain sources, operations, and activities are considered to be insignificant based on following categories.

A. Size or emission rate
B. Type of activity
C. Type of pollutant

Table List of Insignificant Activities

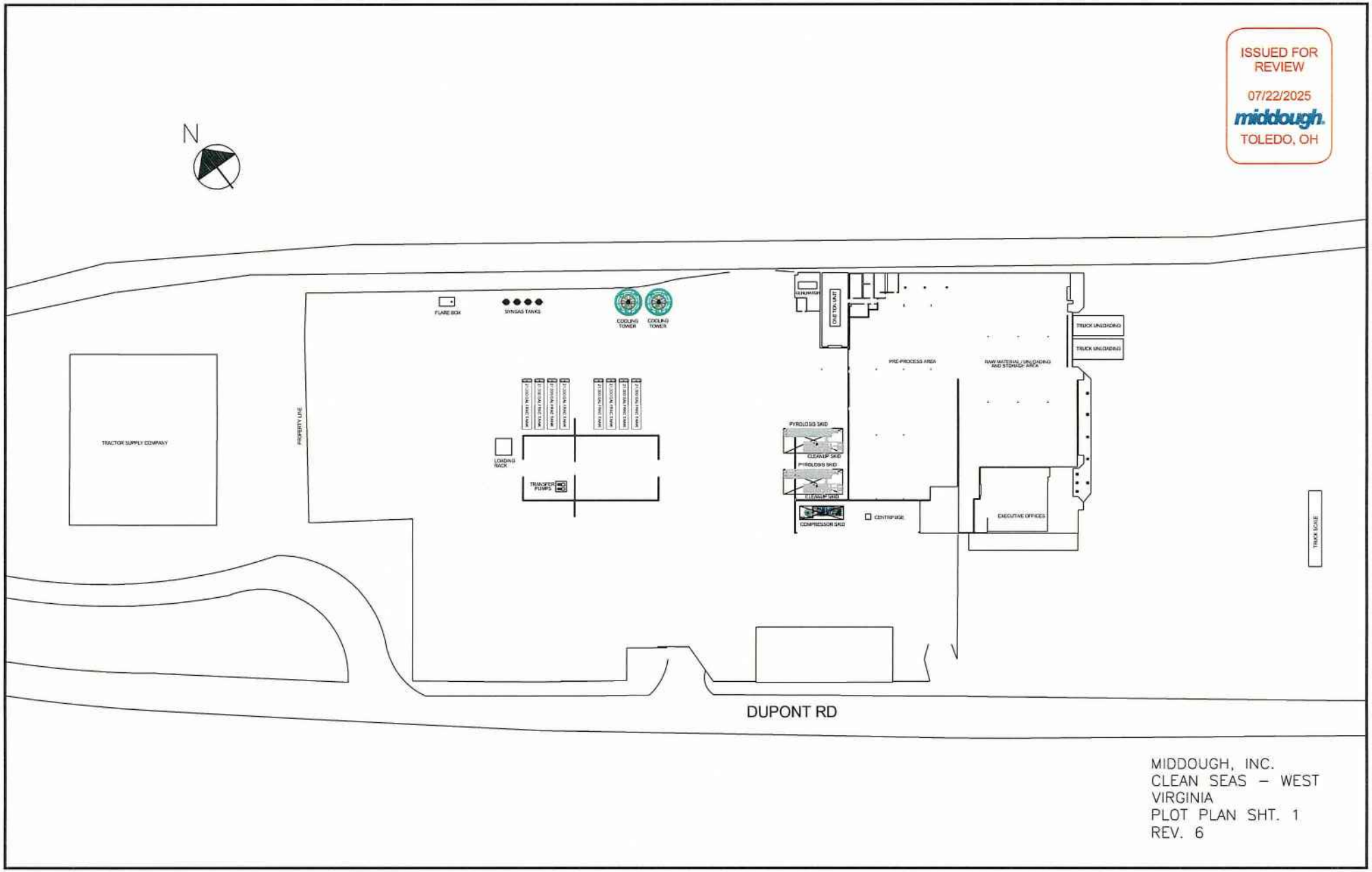
Insignificant Activity	Insignificant Activity Subcategory Class
- Two 0.2-MMBtuihr gas-fired HVAC furnaces - Six 0.05-MMBtu/hr space heaters	A-5

ISSUED FOR REVIEW

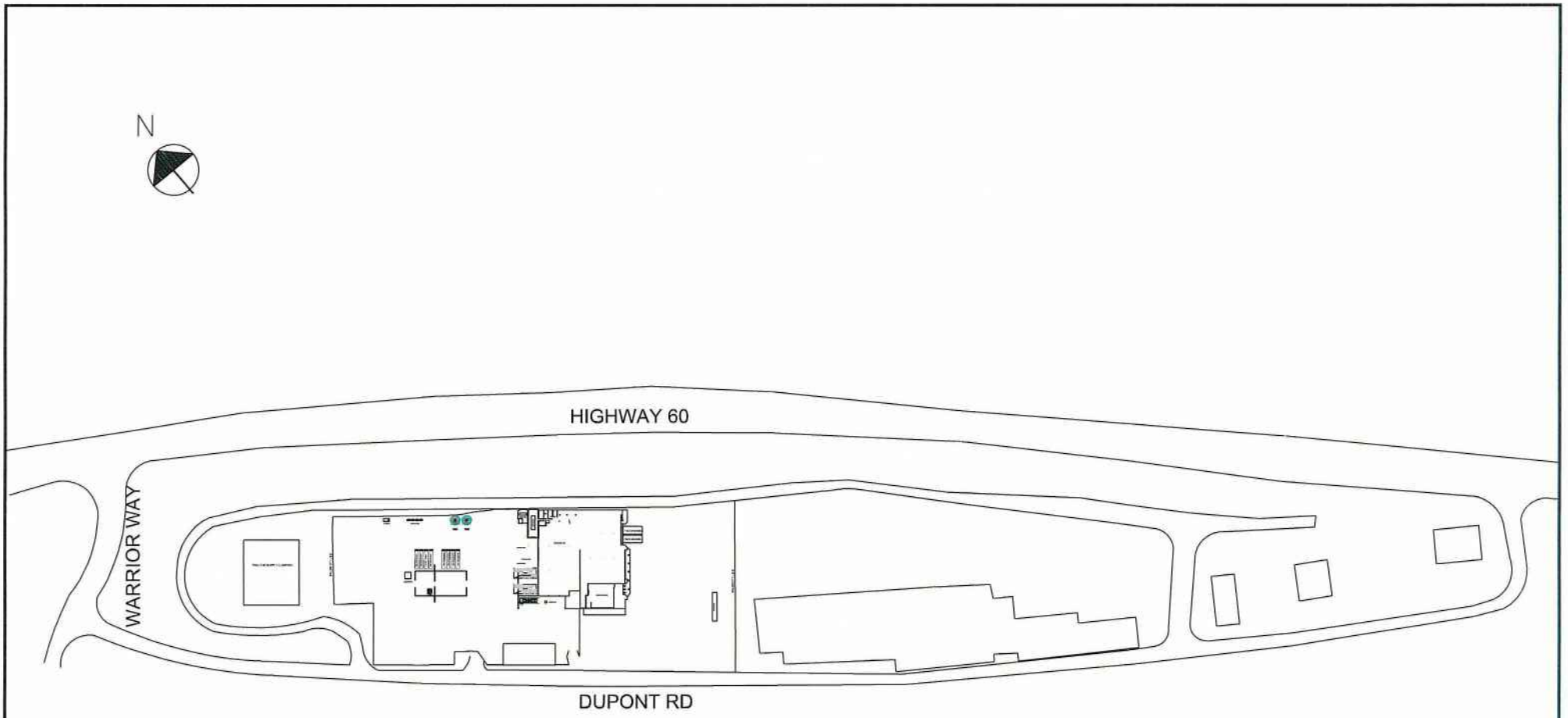
07/22/2025

middough.

TOLEDO, OH



MIDDOUGH, INC.
CLEAN SEAS – WEST VIRGINIA
PLOT PLAN SHT. 1
REV. 6



ISSUED FOR REVIEW
07/22/2025
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TOLEDO, OH

MIDDOUGH, INC.
CLEAN SEAS – WEST VIRGINIA
PLOT PLAN SHT. 2
REV. 2

N

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07/22/2025

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TOLEDO, OH

MIDDOUGH, INC.
CLEAN SEAS – WEST VIRGINIA
PLOT PLAN SHT. 3
REV. 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

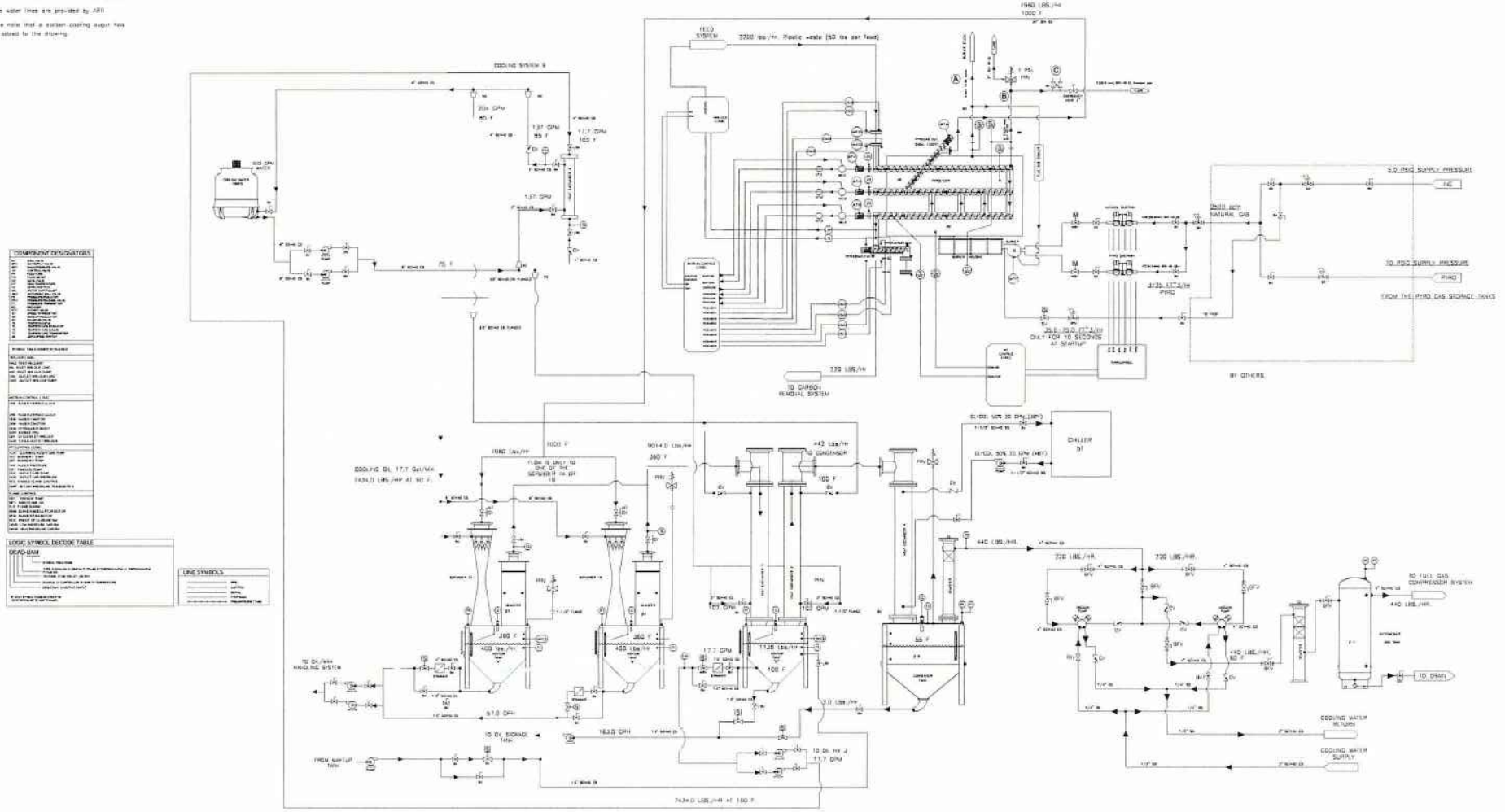
(A) Short stubs will be provided. Installer shall continue through the roof with insulation.

(B) 3.0" threaded SCH 40 SS.

(C) Optional for pressure and temperature gauges

(D) Purple water lines are provided by ARTI

(E) Please note that a carbon cooling auger has been added to the drawing.



ITEMS	QTY.	PART NUMBER	MATERIAL	DESCRIPTION	VENDOR

DATE: 08/07/2024

DRAWN BY: A. Taki

CHECKED BY: L. Mahjoob

APPROVED BY: L. Mahjoob

TOLERANCE BLOCK
UNLESS OTHERWISE SPECIFIED

DECIMAL: .x = ± .05
.xx = ± .03
.xxx = ± .010

FRACTIONAL: ± 1/16"
x"(inch) = ± 1/16"
x' (feet) = ± 1/16"

ANGULAR: ± 1°

American Renewable Technologies, Inc.
ARTI
25 Rancho Circle
Lake Forest, Ca. 92630
Tel.: (949) 446-4011
Fax: (949) 317-3590

TITLE: 25 TONS/HR. PLASTIC

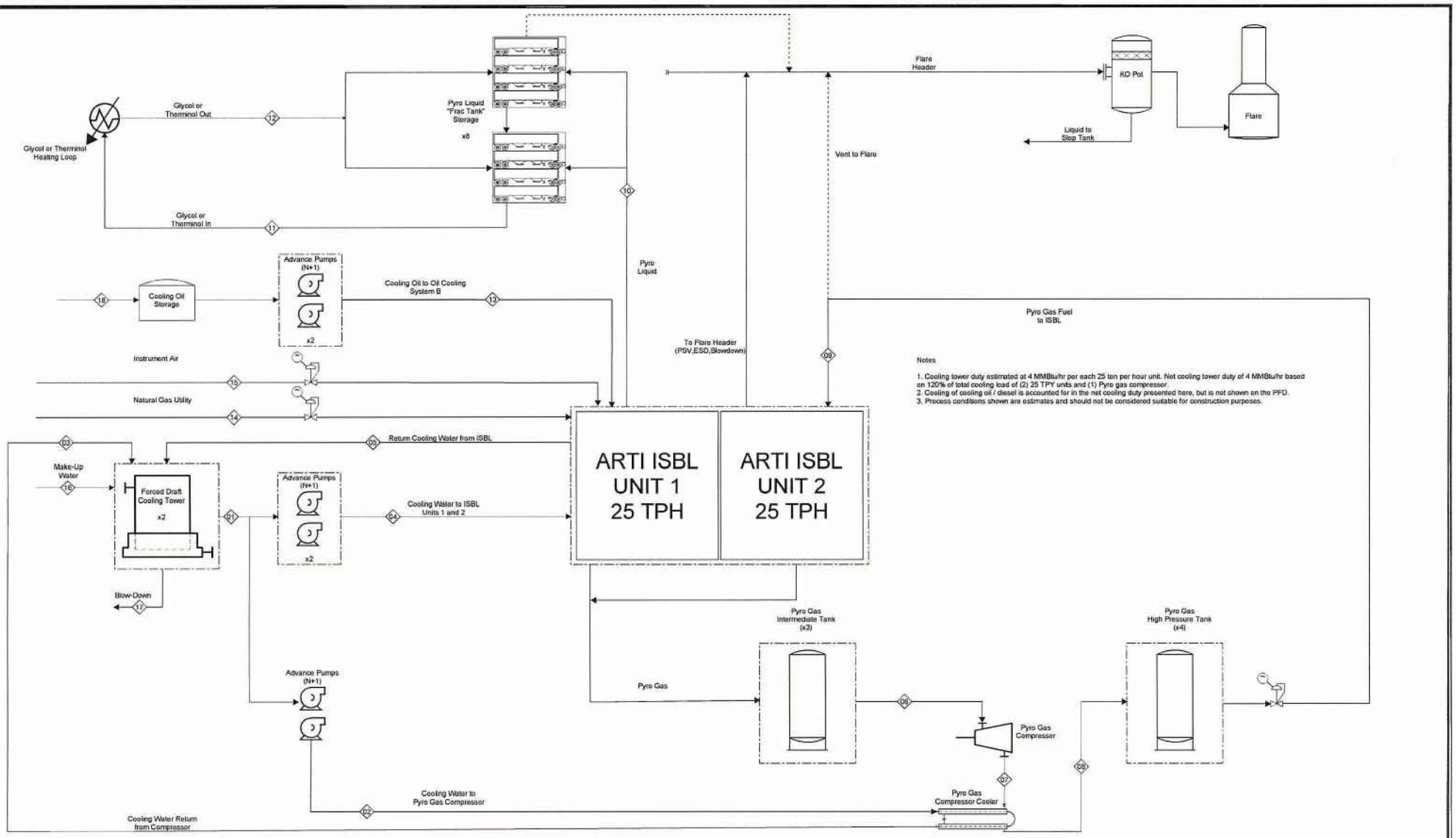
CUSTOMER: CLEAN-SEAS

DWG NAME: P&ID - Complete System

SCALE:

SHEET: 1 OF 4

REV. 0



REV.	DESCRIPTION	DATE	BY	CHKD	APRD

REV.	DESCRIPTION	DATE	BY	CHKD	APRD

middough.

GENERAL
PROCESS FLOW DIAGRAM
SHEET 1 of 2
UIS2501

PROJECT	
LOCATION	SCALE: NONE
PROJ NO.	
DRAWING NO.:	REV.: A
UIS2501-350-PFD-0001-02	

middough PROJECT SOLUTIONS

		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Total Properties																			
Temperature	F	85.0	85.0	111.3	85.0	94.6	60.0	450.2	95.0	93.2	94.3	250.0	221.1	95.0	100.0	70.0	85.0	85.0	95.0
Pressure	psig	10.0	10.0	10.0	10.0	10.0	1.3	100.0	100.0	10.0	1.3	10.0	5.0	5.0	5.0	100.0	0.0	0.0	1.3
Molar Flow	MMSCFD	89.2	2.5	2.5	86.7	86.7	0.4	0.4	0.4	0.4	6.32E-02	0.2	0.2	0.3	0.1	0.3	1.4	0.2	0.2
Mass Flow	lb/hr	176459.0	5027.3	5027.3	171431.7	171431.7	466.2	466.2	440.0	440.0	1057.3	500.0	500.0	7220.8	110.3	1000.0	2685.0	466.4	6141.9
Mass Enthalpy	Btu/lb	-6794.8	-6794.8	-6768.5	-6794.8	-6785.1	-1337.5	-1035.5	-1332.8	-1332.8	-925.6	-4848.4	-4874.1	-923.6	-1924.2	-2.7	-6794.8	-6794.8	-924.4
Vapour Fraction		0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Liquid Fraction		1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Vapor Properties																			
Std Gas Flow	MSCFD	---	---	---	---	---	371.3	371.3	361.8	361.8	---	---	---	---	60.0	314.6	---	---	---
Actual Gas Flow	ACFM	---	---	---	---	---	237.4	57.9	34.3	159.0	---	---	---	---	33.4	28.3	---	---	---
Molar Flow	MMSCFD	---	---	---	---	---	0.4	0.4	0.4	0.4	---	---	---	---	0.1	0.3	---	---	---
Mass Flow	lb/hr	---	---	---	---	---	466.2	466.2	440.0	440.0	---	---	---	---	110.3	1000.0	---	---	---
Mass Enthalpy	Btu/lb	---	---	---	---	---	-1337.5	-1035.5	-1332.8	-1332.8	---	---	---	---	-1924.2	-2.7	---	---	---
Molecular Weight		---	---	---	---	---	11.44	11.44	11.08	11.08	---	---	---	---	16.74	28.95	---	---	---
Mass Density	lb/ft3	---	---	---	---	---	0.03	0.13	0.21	0.05	---	---	---	---	0.06	0.59	---	---	---
Mass Heat Capacity	Btu/lb-F	---	---	---	---	---	0.71	0.85	0.74	0.73	---	---	---	---	0.53	0.24	---	---	---
SG Air	rel_to_air	---	---	---	---	---	0.39	0.39	0.38	0.38	---	---	---	---	0.58	1.00	---	---	---
Compressibility		---	---	---	---	---	1.00	1.00	1.00	1.00	---	---	---	---	1.00	0.99	---	---	---
Cp/Cv (Gamma)		---	---	---	---	---	1.33	1.26	1.33	1.33	---	---	---	---	1.29	1.42	---	---	---
Higher Heating Value	Btu/SCF	---	---	---	---	---	---	---	---	---	---	---	---	---	1040.2	---	---	---	---
Viscosity	cP	---	---	---	---	---	---	---	---	---	---	---	---	---	1.1644E-02	---	---	---	---
Gas\Water Content	lb/MMSCF	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Liquid Properties																			
Standard Ideal Liquid Volume Flow	USGPM	353.1	10.1	10.1	343.1	343.1	---	---	---	---	2.669	0.9	0.9	17.4	---	---	5.373	0.9	14.8
Actual Volume Flow	USGPM	351.0	10.0	10.1	341.0	342.4	---	---	---	---	2.718	1.0	1.0	17.7	---	---	5.341	0.9	15.1
Molar Flow	lbmole/hr	9795.0	279.1	279.1	9515.9	9515.9	---	---	---	---	6.9444	17.9	17.9	32.0	---	---	149.0	25.9	27.3
Mass Flow	lb/hr	176459.0	5027.3	5027.3	171431.7	171431.7	---	---	---	---	1057.3	500.0	500.0	7220.8	---	---	2685.0	466.4	6141.9
Mass Enthalpy	Btu/lb	-6794.8	-6794.8	-6768.5	-6794.8	-6785.1	---	---	---	---	-925.6	-4848.4	-4874.1	-923.6	---	---	-6794.8	-6794.8	-924.4
Molecular Weight		18.0	18.0	18.0	18.0	18.0	---	---	---	---	152.3	27.9	27.9	225.3	---	---	18.0	18.0	225.0
Mass Density	lb/ft3	62.7	62.7	62.0	62.7	62.4	---	---	---	---	48.5	61.6	62.5	50.9	---	---	62.7	62.7	50.6
Mass Density	SG_60/60api	1.0	1.0	1.0	1.0	1.0	---	---	---	---	0.8	1.0	1.0	0.8	---	---	1.0	1.0	0.8
Mass Heat Capacity	Btu/lb-F	1.0	1.0	1.0	1.0	1.0	---	---	---	---	0.5	0.9	0.9	0.5	---	---	1.0	1.0	0.5
Compressibility		0.0	0.0	0.0	0.0	0.0	---	---	---	---	0.0	0.0	0.0	0.0	---	---	0.0	0.0	0.0
Cp/Cv (Gamma)		1.2	1.2	1.2	1.2	1.2	---	---	---	---	1.2	1.1	1.1	1.3	---	---	1.2	1.2	1.2
Viscosity	cP	0.8	0.8	0.6	0.8	0.7	---	---	---	---	1.3	0.5	0.6	4.7	---	---	0.8	0.8	4.8
Surface Tension	dyne/cm	71.3	71.3	68.8	71.3	70.4	---	---	---	---	23.7	46.5	48.7	27.2	---	---	71.3	71.3	26.4
Reid VP at 37.8 C	psia	---	---	---	---	---	---	---	---	---	1.7	---	---	0.0	---	---	---	---	0.6
True VP at 37.8 C	psia	---	---	---	---	---	---	---	---	---	16.0	---	---	0.0	---	---	---	---	15.9
Watson K		---	---	---	---	---	---	---	---	---	11.9	---	---	12.2	---	---	---	---	12.2

REV	DESCRIPTION	DATE	BY	CHKD	APRD	REV	DESCRIPTION	DATE	BY	CHKD	APRD

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GENERAL
PROCESS FLOW DIAGRAM
SHEET 2 of 2
UIS2501

PROJECT:	
LOCATION:	SCALE: NONE
PROJ NO:	
DRAWING NO.:	REV.: A
UIS2501-350-PFD-0001-02	

Clean Seas Facility

Attachment G – Process Description

Clean Seas West Virginia LLC (Clean Seas) is constructing the Clean Seas facility near Belle in Kanawha County West Virginia. The facility will process plastics into marketable products: precursors for plastics, fuel, and oil.

This thermochemical pyrolysis process converts used plastic material into oil, gas and residue by heating in the absence of oxygen. The process involves breaking down large plastic molecules into smaller hydrocarbon molecules resulting in the production of these three main outputs.

The facility will receive plastic feedstock from outside suppliers. The supplier will clean and sort to remove paper, metals and dirt, and the plastic is then shredded into smaller pieces to increase the surface area in preparation for conversion.

The pyrolysis reactors feed the plastic through two valves sequenced to prevent escape of gases and air from entering the piping in the furnace. This piping is called a retort and has several passes that have powered augers to push the plastic through heating it to between 700F and 1200F. This temperature increase converts the plastic into oil, gas and residue.

Natural gas will be used to initially fire burners converting the plastic into pyrolysis oil, pyrolysis gas and solid residue. When sufficient non-condensable synthetic gas is generated, the two Pyrolysis furnace burners will be fueled by the synthetic gas using low NOx burners. The Pyrolysis equipment is combined onto a skid. The equipment will operate at a slight vacuum to prevent leakage.

Cooling, separation, centrifuge, pumping and refrigeration equipment separate the oil, gas and residue into concentrated streams that will be stored and sold. A flare will collect flows from pressure relief valves, vents and sources of overpressure due to shutdowns or upsets designed to efficiently combust gases preventing raw gas emissions to the atmosphere.

The pyrolysis oil (oil) will be stored in 8 portable storage tanks (Baker style) which will be nitrogen blanketed and have pressure vacuum vents connected to the flare. Nitrogen and the venting controls will eliminate emissions to the atmosphere as any vapors will go to the flare for combustion. Tanks will be in dikes to contain any spills. Oil will be sold and shipped by third party trucks. Truck loading will be a closed system to eliminate vapor emissions. Truck loading will have curbing to contain any potential spills. Trucks delivering plastic feedstock and shipping products will be weighed into and out of the facility.

A backup generator will provide backup electrical power to enable safe shutdown of the operations in the event of a power outage. This generator will reduce the possibility of flaring in the event of a power outage. The generator is intended for backup power and will be fueled by natural gas to reduce emissions.

Pyrolysis gases are the non-condensable gases, mainly methane, ethane, propane, butane, CO, CO2 and H2 that can be used as a fuel source to power the pyrolysis process or other industrial applications. Pyrolysis gases will be stored in cylinders for use in the pyrolysis process.

Solid residue will enter a covered bin to contain any dust. The residue will be sold for soil amendment or other applications.

The system consists of the following subsystems:

1. The Furnace:

An insulated enclosure which contains two burners that provide the heat needed to sustain the pyrolysis process. The hot flue gases flow up and around the three retort tubes inside of the furnace before exiting the stack. The material in the inside diameter of the retorts are isolated from the furnace environment so the hot flue gases cannot come into direct contact with the process material being conveyed through the retorts. The furnace is equipped with burners capable of operating with natural gas or pyrolysis gas. The heat from the burners travels across the outer diameter of three passes to efficiently heat the retorts. The flue gas temperature is normally 150 to 200 °F above the retort operating temperature. The furnace is designed to allow the retorts to thermally expand and contract during the operation.

2. The Retorts:

The retorts are installed within the furnace having an inlet and an outlet end. The material is fed to the retort via a double blade air sealed valve. This valve is important because it prevents the passage of air into the retort. The material is fed into the retorts from a manually loaded hopper, when the top blade opens it allows the material to enter the empty cavity of the valve below. Once the top blade has closed the bottom blade opens to feed the material into the retort. This valve is synchronized with an auger to introduce feed into the retort. As the feedstock material travels through the retorts it gasifies. The gases are collected under a slight negative pressure and flow out of the retorts. As the gasification sequence of the material ends, the residue exits the retorts through a similarly designed double blade valve thus maintaining the slight vacuum during the discharge of this residue. This residue is passed through a water-cooled auger to reduce the temperature to a level which is safe for handling.

The solid residue, typically a maximum 5% of the original value, can be landfilled or diverted to industrial use. At initial start-up Clean-Seas will transfer to EPA approved landfill as we characterize the material and find a beneficial use for it.

3. The Augers:

The retorts are equipped with high temperature stainless steel augers which move the material from the inlet, through the retort, and finally to the discharge point. The speed of the augers can be changed at the Operator Control Panel to suit the material processed.

4. The Burners:

The furnace is equipped with burners fueled with either natural gas or pyrolysis gas. The burners are supplied with a flame safeguard control and can be modulated to a higher firing rate on demand. A temperature control installed on the retorts allows the burner to start and to modulate. Once the burners are turned on, they modulate to a firing position where they heat the retorts to the pre-set temperature. When the temperature demand is satisfied the burners modulate back to the lower firing rate. If the temperature exceeds its preset upper limit the burners automatically shut down. If the retort temperature falls below the lower set point the burner will automatically start and raise the temperature back to the upper set point.

5. The Cyclone Separator:

The Cyclone Separator is installed at the exhaust point of the gases. This unit will separate any particles from the gas before the gas travels to the gas Particle Wash System.

6. The Particle Wash System:

The Particle Wash System is installed after the Cyclone Separator. The Particle Wash System contains 10 to 15 gallons of light oil. The Wash Pump energizes as the unit starts to operate and re-circulates the washing media. This washing process takes place in a venturi and any heavy particles such as tar or wax can be removed from the gas and will be retained within the Particle Wash System. A glass level indicator is supplied with the Particle Wash System. The unit must be drained from time to time to keep the level low enough for the gas to travel through. Once the gas has been cleaned through the venturi it travels through the demister and liquid particles are stripped from the gas.

7. The Condenser:

As the gas exits the Particle Wash System, it enters a Vertical Condenser. All condensable gases or water is stripped from the gas and non-condensable gases travel through another demister to the gas blowers.

8. The Gas Blower

A Gas Blower is supplied to remove the gases from the system while maintaining the slight negative pressure within the system. It is a Roots-type positive displacement blower. The blower is controlled through the use of a pressure transducer installed on the retort. This transducer senses the rate of gasification. As the gasification process gas flow changes, the retort pressure rises or falls and sends a signal to the blower speed control to compensate. In this way the operating retort vacuum is maintained at a preset level. This ensures the quality and uniformity of the by-products.

9. PPO Product Storage

Once plastic pyrolysis oil liquid exits the process, it is then sent to storage prior to shipping to offtakers. The oil will be stored in (8) 21,000 gallon portable storage tanks (Baker Style) tanks with a maximum of 18,000 gallon storage capacity to allow freeboard space for thermal expansion of material. The tanks have an internal coil that will allow the flow of heated water to keep the contents above pour point temperature ~100F

10. PPO Loading Rack

The PPO will be transported via pipe to a loading rack. Trucks will enter the facility to transfer oil into approved tanker trailers supplied by the offtaker. The system will be closed loop, meaning that the vapors from the tanker will enter the process to eliminate venting of vapors to the atmosphere.

Attachment I

Emissions Unit Table

(includes all emission units and air pollution control device that will be part of this permit aplication review, regardles of permit status)

Emissions Unit ID	Emissions Point ID	Emissions Units Description	Year Installed / Modified	Design Capacity	Type and Date of Change	Control Device
1S	1E	Pyrolysis Unit #1	TBD	3 mmBTU/Hr	New	1C
2S	2E	Pyrolysis Unit #2	TBD	3 mmBTU/Hr	New	2C
3S	3E	Flare	TBD	1-5 mmBTU/Hr	New	3C
4S	4E	Frac Tanks (8 total)	TBD	21,000 gal/tk	New	4C
5S	5E	Generator Nat Gas Fuel	TBD	150 kWh	New	5C
6S	6E	Truck Loading Rack	TBD	15k gal/day	New	6C
7S	7E	Gycol Circulation Heater	TBD	2.5 mmBTU/Hr	New	7C
8S	8E	TRE- Training, Research & Eval	TBD	0.2mmBTU/Hr	New	8C
9S	9E	TRE- Flare	TBD	0.1 mmBTU/Hr	New	9C

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Test Data provided by ARTI

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)* Type text here	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	UPWARD STACK	1S	BURNER	1C	ANALYZER	C	8,000	NOx CO PE VOC	.12 .12 .0015 0.0	0.872 0.872 0.010 0.000	0.12 0.12 0.005 0.000	0.872 0.872 0.010 0.000	GAS	ST	30 PPM 50 PPM 0.005LB/MMBTU 0.0 PPM
2E	UPWARD STACK	2S	BURNER	2C	ANALYZER	C	8,000	NOx CO PE VOC	.12 .12 .0015 0.0	0.872 0.872 0.010 0.000	0.120 0.120 0.005 0.000	0.436 0.436 0.005 0.000	GAS	ST	30 PPM 50 PPM 0.005 LB/MMBTU 0.0 PPM
3E	UPWARD STACK	3S	BURNER	3C	ANALYZER	note A	144	NOx CO PE VOC	0.240 0.240 0.003 0.000	0.047 0.047 0.0 0.0	0.240 0.240 0.003 0.000	0.047 .013 0.00 0.00	GAS	ST	30 PPM 50 PPM 0 PPM 0 PPM
4E	Upward Vent to Flare	4S	Press vac vent	4C	Process Monitoring	To Flare	N/A	VOCs	TBD	TBD	TBD	TBD	Vapor/N2 to flare	EE	TBD
5E	Upward Stack	5S	Natural gas engine	5C	Catalytic Converter	During Power Outage	70	NOx CO PE VOC	0.894 0.878 Nil 0.252	0.030 0.029 Nil 0.008	0.050 0.374 Nil 0.071	0.002 0.012 Nil 0.002	Gas	ST	TBD
6E	Vapor to Tank	6S	Vapor Line From Truck	6C	vapor contain-ment	During Truck Loading	1,500	VOCs	TBD	TBD	TBD	TBD	Gas	EE	TBD
7E	Upward Stack	7S	Burner	7C	Low NOx Burners	Heat for Process Tanks / Lines	8,760	NOx CO PE VOC	0.100 0.400 0.018 0.015	0.438 1.752 0.077 0.066	0.075 0.400 0.018 0.015	0.329 1.752 0.077 0.066	Gas	EE	TBD
8E	Upward Stack	8S	TRE Burner	8C	Samples During Trials	Test & Training 4 days / week	1,000	NOx CO PE VOC	0.008 0.032 0.001 0.001	0.035 0.140 0.006 0.005	0.006 0.032 0.001 0.001	0.026 0.140 0.006 0.005	Gas	EE	TBD
9E	Upward Stack	9S	TRE Flare	9C	Samples During Trials	Test & Training 4 days / week	1,000	NOx CO PE VOC	0.004 0.016 0.001 0.001	0.002 0.008 0.000 0.001	0.004 0.016 0.001 0.001	0.002 0.008 0.000 0.001	Gas	EE	TBD

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric)

* Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Note A Flare operational for approximately 2x/mo for 6 hrs each SU/SD event for 144hrs/yr

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1S	14 INCHES	460	1700	26.5	1500 FT	35 FT		
2S	14 INCHES	460	1700	26.5	1500 FT	35 FT		
3S	24 INCHES	1800	11820	62.0	1500 FT	35 FT		
4S	TBD	1440	TBD	1500FT	TBD			
5S	TBD	TBD	TBD	1500FT	TBD			
6S	TBD	TBD	TBD	TBD	1500FT	TBD		
7S	TBD	TBD	TBD	TBD	1500FT	TBD		
8S	TBD	TBD	TBD	TBD	1500FT	TBD		
9S	TBD	TBD	TBD	TBD	1500FT	TBD		

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ■ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ■ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ■ Yes ☐ No ■ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ■ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ■ Yes ☐ No ■ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ■ Yes ☐ No ■ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ■ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	N/A					
Unpaved Haul Roads	N/A					
Storage Pile Emissions	N/A					
Loading/Unloading Operations	Diesel Fuel / 68334-30-5 Plastics Pyrolysis Oil/ Not Available	.015lb/connect	0.005 ton/yr	.0015lb/connect	.0005 ton/yr	EPA 42 7.1=9
Wastewater Treatment Evaporation & Operations	N/A					
Equipment Leaks Reference EPA AP-42 section 7.1.4-9	Process Equipment – pumps, exchangers, valves, piping, relief valves, compressors, sample stations, loading hoses, etc.	Does not apply	VOCs 25 tons/yr	Does not apply	VOCs 4.376	EPA 42 7.1-9
General Clean-up VOC Emissions See estimates on pages 3 and 4	Operation and Maintenance of the equipment listed above	3.03 lb/hr	12.1 tons/yr	0.0003 lb/hr	2.67 lb/yr	AP-42 7.1-9
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

EPA 42 equipment leak emission factors for
6 50hp pumps, 6 small heat exchangers at 1psi, 6 small relief valves set at 60psi, 2 small compressors 4psi in 65 psi out, rubber truck loading hoses used 12 times per week
.

Equipment Type	Service Pressure	Unit Emission Factor	Reference (AP-42, Section 7.1.4)
Centrifugal Pump (unpressurized seal)	–	0.11 lb/hr per seal	Table 7.1-4, Light Liquid Service
Centrifugal Pump (pressurized seal)	–	0.50 lb/hr per seal	Table 7.1-4, Light Liquid Service
Small Heat Exchanger (shell-and-tube)	1 psig	0.06 lb/hr per exchanger	Table 7.1-7
Pressure Relief Valve	Set at 60 psig	0.03 lb/hr per valve	Table 7.1-8
Reciprocating Compressor	4 psig inlet / 65 psig outlet	2.2 lb/hr per compressor	Table 7.1-5
Truck-Loading Hose	12 connect/disconnects per week	0.015 lb/event (0.18 lb/week)	Table 7.1-9

EPA 42 controlled equipment leak emission factors for
6 50hp pumps, 6 small heat exchangers at 1psi, 6 small relief valves set at 60psi, 2 small compressors 4psi in 65 psi out, rubber truck loading hoses used 12 times per week
.

Equipment Type	Uncontrolled EF (lb/hr or lb/event)	Control Efficiency (%)	Controlled EF (lb/hr or lb/event)
Centrifugal Pump (50 hp, light liquid)	0.50 lb/hr per seal	90	**0.05 lb/hr per seal**
Small Heat Exchanger (1 psig)	0.06 lb/hr per exchanger	90	**0.006 lb/hr per exchanger**
Relief Valve (60 psig)	0.03 lb/hr per valve	90	**0.003 lb/hr per valve**
Reciprocating Compressor	2.2 lb/hr per unit	90	**0.22 lb/hr per unit**
Truck-Loading Hose (per connect/disconnect)	0.015 lb/event	90	**0.0015 lb/event**

Controlled emission factors assume a generic **90% reduction** from typical LDAR (Leak Detection and Repair) or equivalent control program as referenced in EPA guidance (e.g., EPA OAQPS memorandum on LDAR efficiencies).

🔍 **Applying Controlled Factors**

Each controlled factor is calculated as:
controlled EF = uncontrolled EF × (1 − control efficiency)
For example, a centrifugal pump uncontrolled factor of **0.50 lb/hr** with 90% control yields **0.05 lb/hr**.

📊 **Total Controlled Emissions Calculation**

To estimate your facility's controlled emissions:

1. Pumps: 6 pumps × 2 seals each × **0.05 lb/hr** = **0.60 lb/hr**
2. Heat exchangers: 6 × **0.006 lb/hr** = **0.036 lb/hr**
3. Relief valves: 6 × **0.003 lb/hr** = **0.018 lb/hr**
4. Compressors: 2 × **0.22 lb/hr** = **0.44 lb/hr** **Sum of 1-4 = 1.094 lb/hr** **Annual 8000hrs x 1.094 / 2000 lbs/ton= 4.376 Tons/yr Controlled**
5. Loading hoses: 12 events/week × **0.0015 lb/event** = **0.018 lb/week**

Convert to consistent units as needed (e.g., lb/year or kg/year).

EPA 42 general clean up voc emission factors for
6 50hp pumps, 6 small heat exchangers at 1psi, 6 small relief valves set at 60psi, 2 small compressors 4psi in 65 psi out, rubber truck loading hoses used 12 times per week

.

Pumps and Mechanical Seals

For each of the six **50 hp centrifugal pumps**, AP-42 Table 7.1-4 gives an emission factor of **0.28 lb/hr** under clean-up service conditions with mechanical seals.
Total VOCs from pumps = 6 pumps × 0.28 lb/hr = **1.68 lb/hr**.

Heat Exchangers

Each of the six small shell-and-tube heat exchangers leaking at **1 psig** uses gasketed flanges. AP-42 Table 7.1-5 lists **0.015 lb/hr** per exchanger.
Total VOCs = 6 exchangers × 0.015 lb/hr = **0.09 lb/hr**.

Relief Valves

Six small relief valves set at **60 psig** in chemical service emit **0.20 lb/hr** each (AP-42 Table 7.1-6).
Total VOCs = 6 valves × 0.20 lb/hr = **1.20 lb/hr**.

Compressors

Two reciprocating compressors with **4 psig** suction and **65 psig** discharge fall under AP-42 Table 7.1-7. The factor is **0.032 lb/hr** per unit.
Total VOCs = 2 compressors × 0.032 lb/hr = **0.064 lb/hr**.

Rubber Truck Loading Hoses

AP-42 Section 5.2.3 provides a *per-unload* factor of **0.006 lb VOC** for rubber hoses in tank truck loading. At **12 unloads per week**, annualized emissions are:
12 unloads/week × 52 weeks × 0.006 lb = **3.74 lb/year**.

Annual and Hourly Totals

- **Hourly Total (continuous leaks)**
  1.68 (pumps) + 0.09 (exchangers) + 1.20 (valves) + 0.064 (compressors) = **3.03 lb/hr**
- **Annual Hose Emissions**
  3.74 lb/year (hose fugitive only)

EPA 42 general clean up controlled voc emission factors for
6 50hp pumps, 6 small heat exchangers at 1psi, 6 small relief valves set at 60psi, 2 small compressors 4psi in 65 psi out, rubber truck loading hoses used 12 times per week

.
*Assumes 1 hr operation per exchanger per week (52 weeks).
**Assumes two relief valve actuations per year.
***Assumes 2 hr/week operation (52 weeks).

Direct Annual Emissions Summary

The **total annual VOC emissions** from all listed equipment are:
(6 pumps × 0.19) + (6 exchangers × 0.005) + (6 valves × 0.02) + (2 compressors × 0.63) + (1 hose set × 0.12) = **1.14 + 0.03 + 0.12 + 1.26 + 0.12** = **2.67 lb VOC/yr**

Notes on Calculations

- The **pump factor** comes from a generic reciprocating seal system (AP-42 Section 7.1).
- For **heat exchangers**, emissions are negligible; assumed minimal purge and leakage hours.
- **Relief valves** in non-fire cases are rarely actuated; default two events per year.
- **Compressors** use the same seal-leakage factors as pumps but scaled to horsepower and operating hours.
- **Loading hoses** use AP-42's storage-tank loading emission fraction adjusted to cycles.

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*): 6 S

1. Loading Area Name: Truck Loading Rack

2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply):

☐ Drums ☐ Marine Vessels ☐ Rail Tank Cars ☑ Tank Trucks

3. Loading Rack or Transfer Point Data:

Number of pumps	TWO (2)
Number of liquids loaded	ONE (1)
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	ONE (1)

4. Does ballasting of marine vessels occur at this loading area?

☐ Yes ☐ No ☑ Does not apply

5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:

6. Are cargo vessels pressure tested for leaks at this or any other location?

☐ Yes ☑ No

If YES, describe:

7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	3	3	3	3
days/week	5	5	5	5

weeks/quarter	13	13	13	13

8. Bulk Liquid Data *(add pages as necessary):*							
Pump ID No.		TBD					
Liquid Name		PY OIL					
Max. daily throughput (1000 gal/day)		15,400					
Max. annual throughput (1000 gal/yr)		3400					
Loading Method [1]		PUMP					
Max. Fill Rate (gal/min)		100					
Average Fill Time (min/loading)		120					
Max. Bulk Liquid Temperature (^{o}F)		100					
True Vapor Pressure [2]		1.43	PSIA@100F	0.42	PSIA@60°F		
Cargo Vessel Condition [3]							
Control Equipment or Method [4]		Closed Vapor Loading					
Minimum control efficiency (%)		90%					
Maximum Emission Rate	Loading (lb/hr)	0.015	per loading 1 hr				
	Annual (lb/yr)	9					
Estimation Method [5]		AP42 7.1-9					

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill SUB

[2] At maximum bulk liquid temperature 100F VB common carrier 0.015 lb/hose connect (max), 0.0015 lb/hose colled

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), ◉ = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*):CA = Carbon Adsorption LOA = Lean Oil AdsorptionCO = Condensation SC = Scrubber (Absorption)CRA = Compressor-Refrigeration-Absorption TO = Thermal Oxidation or Incineration
CRC = Compression-Refrigeration-Condensation VB = Dedicated Vapor Balance (closed system)
O = other (descibe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance

TM = Test Measurement based upon test data submittal
O = other (describe)

9. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING

Before loading or unloading each truck, operations and truck drivers will check for system integrity upon initial connection and at completion of the product loading. Control devices including VOC control devices (e.g., pressure, temperature, or flow rate) will be in place to maintain system integrity. Collection pans, curbing and other equipment will be used to catch any material when hoses or piping are disassembled.

RECORDKEEPING

Maintain records of all testing and calculations performed to demonstrate compliance.
Clean Seas will keep records of maintenance and inspection activities related to the loading rack and control equipment. The facility will log operational data, including any deviations from normal operating conditions or malfunction events.

REPORTING

Clean Seas will maintain records of shipments, incidents, oil quality/properties and inventories. Deviations from permit requirements or malfunctions resulting in excess emissions will be logged and reported to the WVDEP, as specified in the facility's permit.
An emission Inventory will be prepared and submitted annually, detailing the amount of air pollutants emitted from the loading rack and other sources at the plant.

TESTING

The Clean Seas truck loading will be designed to contain vapors preventing any leakage to atmosphere. The loading design will control VOC emissions through the application of reasonably available control technology (RACT). Testing of the loading system will be completed before each truck loading to verify that the hoses, piping and equipment are properly aligned and in working condition. Initial and period testing will be used to demonstrate compliance with these emission limits.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

Design is in progress

The estimated True Vapor Pressure (TVP) for the plastics pyrolysis oil at **100°F** is approximately **1.43 psia**.

The estimated True Vapor Pressure (TVP) for the plastics pyrolysis oil at **60°F** is approximately **0.42 psia**.
As always, this is a rough estimate based on assumed Antoine constants. For more accurate results, specific constants for the actual pyrolysis oil should be used.

Truck Loading Rack
4mm gallons/yr
6000 gal/truck

15385	gal/workday
3957642.9	gal/yr
2.6	trucks/day
12.8	trucks/week
100.0	loading rate gpm
153.8	loading time minutes
2.6	hrs Loading time/day
613.3	Annual loading hours

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (http://www.epa.gov/tnn/chief/).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Baker Tanks	2. Tank Name PPO Baker Tanks
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 4E , 4S Baker Tanks 1-8	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 4 E
5. Date of Commencement of Construction (for existing tanks) TBD	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Eight (8) Tanks (21,000 gallons each) will be leased or purchased and installed in tank dikes designed to hold 110% of contents plus planned rainfall (TBD). Nitrogen purge and venting to the flare will prevent emissions of vfapor to the atmosphere.	
7A. Does the tank have more than one mode of operation? ☒ Yes ☐ No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). During statup and shutdown one of the PPO tanks to hold startup products before meeting specifications for sales.These intermediates will be reprocessed to meet sales specs.	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Tanks to be heated in the winter, purged with nitrogen and vapors vented to the flare for safe and low emissions operation.	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. Tanks size 21,000 gallons with max fill of 18,000 gallons PPO	
9A. Tank Internal Diameter (ft) rectangular	9B. Tank Internal Height (or Length) (ft) length 36 ft
10A. Maximum Liquid Height (ft) 9.75 ft	10B. Average Liquid Height (ft) 8.4 ft
11A. Maximum Vapor Space Height (ft) 9.75	11B. Average Vapor Space Height (ft) 5 ft
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 18,000 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
3.96 mm gal/yr	10,850 gal

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
27.5 turnovers per year

15. Maximum tank fill rate (gal/min) 8.33 gal/min

16. Tank fill method ☒ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☒ Fixed Roof ___ vertical ___ horizontal x flat roof ___ cone roof ___ dome roof ___ other (describe)
- ☐ External Floating Roof ___ pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof ___ vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☒ Other (describe) rectangular frac tank, N2 purged and vented to the flare

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) steel

20A. Shell Color TBD	20B. Roof Color TBD	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☒ YES ☐ NO

22B. If YES, provide the operating temperature (°F) 100F

22C. If YES, please describe how heat is provided to tank. 50/50 Glycol/water circulation from a natural gas fired heater

23. Operating Pressure Range (psig): 0 to 2 psig

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☒ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED: TBD	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED: TBD	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED: TBD	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL	
PIP COLUMN – SLIDING COVER, GASKETED: TBD	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED: TBD	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED: TBD	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED: TBD	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED: TBD	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)	
OPEN:	90% CLOSED:

STUB DRAIN
1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

Tanks not purchased or leased at this time.

26. Complete the following section for Internal Floating Roof Tanks ☒ Does Not Apply		
26A. Deck Type: ☐ Bolted ☐ Welded		
26B. For Bolted decks, provide deck construction:		
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)		
26D. Deck seam length (ft)	26E. Area of deck (ft^2)	
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:	

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:			
34A. Minimum (°F) 100F		34B. Maximum (°F) 120F estimated	
35. Average operating pressure range of tank:			
35A. Minimum (psig) -1 psig slight vacuum est		35B. Maximum (psig) 2 psig estimated	
36A. Minimum Liquid Surface Temperature (°F) 60F Est		36B. Corresponding Vapor Pressure (psia) 0.42 psia est	
37A. Average Liquid Surface Temperature (°F) 100F est		37B. Corresponding Vapor Pressure (psia) 1.43 psia est	
38A. Maximum Liquid Surface Temperature (°F) 100F est		38B. Corresponding Vapor Pressure (psia) 1.43 psia est	
39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition	PPO	Plastics Pyrolysis Oil	
39B. CAS Number	UN-No (DOT)	3295	Hydrocarbons, liq
39C. Liquid Density (lb/gal)	6.7 lb/gal		
39D. Liquid Molecular Weight (lb/lb-mole)	150 to 200	estimated	
39E. Vapor Molecular Weight (lb/lb-mole)	50 to 100	estimated	

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	1.43 psia at 100F est 2.15 psia est		
Months Storage per Year 39H. From 39I. To	Jan to Dec entire year		

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☒ Inert Gas Blanket of N2
- ☒ Insulation of Tank with TBD
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Vent vapors to flare

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See above					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

- ☐ *Emergency Vent Summary Sheet*
- ☐ *Leak Sources Data Sheet*
- ☐ *Toxicology Data Sheet*
- ☑ *Reactor Data Sheet*
- ☐ *Distillation Column Data Sheet*

1. Chemical process area name and equipment ID number (as shown in *Equipment List Form*)

PYROLYSIS SYSTEM

2. Standard Industrial Classification Codes (SICs) for process(es)

1311

3. List raw materials and ☐ attach MSDSs

PLASTIC WASTE

4. List Products and Maximum Production and ☐ attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)
ONE TON/HR. PLASTIC PYRO	2200	8000
ONE TON/HR. PLASTIC PYRO	2200	8000

5. Complete the *Emergency Vent Summary Sheet* for all emergency relief devices.

6. Complete the *Leak Source Data Sheet* and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.

SYSTEM OPERATED AT -2 TO -4 INCHES OF WATER PRESSURE. ALL EMERGENCY RELIEFS SHALL BE SENT TO AN ENCLOSED AND EMISSION CONTROLLED FLARE SYSTEM.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.

FLOOR SPILLS SHALL BE DRIED USING SAW DUST FIRST AND THEN WASHED WITH PROPER DETERGENTS . LIQUID SHALL BE SAVED FRO PROPER SEPARATION OF CODS FOR DISPOSAL.

8A. Complete the *Toxicology Data Sheet* or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references.

8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).

9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)

9A. Types and amounts of wastes to be disposed: NONE

9B. Method of disposal and location of waste disposal facilities:

Carrier: Phone:

9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum	24 HRS/DAY		330 DAYS PERYEAR
10B. Typical	24 HOURS/DAY		330 DAYS PER YEAR

11. Complete a *Reactor Data Sheet* for each reactor in this chemical process.

12. Complete a *Distillation Column Data Sheet* for each distillation column in this chemical process.

13. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING OPERATION SHALL BE RECORDED 24/7 AND DATA SHALL BE STORED.	RECORDKEEPING DATA SHALL BE STORED AND DUPLICATED.
REPORTING SHALL BE REPORTED WEEKLY.	TESTING SHALL BE PERFORMED DAILY.

MONITORING. Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

RECORDKEEPING. Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING. Please describe the proposed frequency of reporting of the recordkeeping.

TESTING. Please describe any proposed emissions testing for this process equipment or air pollution control device.

14. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
EMISSION TESTS SHALL BE PERFORMED ON BURNERS USING STACK ANALYZER FOR CO,NOX,CO2,O2,N2 EMISSIONS WEEKLY.

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
   a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
   b. continuous emissions (in-stack) monitoring plan
   c. ambient monitoring plan
   d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process:
  a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
  b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
  c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following
   a. Emissions of each pollutant in pound(s) per batch, from each process step
   b. Annual emissions based on number of batches requested per year
   c. The total time for each process step and the duration of the emissions during the process step
   d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture disks, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)
Detailed design is in progress, this sheet will be updated as the designs are completed.				
N/A				

All routine vents (non-emergency) should be listed on the *Emission Points Data Summary Sheet.*

[1] Indicate the emission point, if any, to which source equipment normally vents. Do not assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]	Detailed design is in progress, this sheet will be updated as the designs are completed.			
	heavy liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC				
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC				
	Non VOC				
Open-ended Lines[12]	VOC				
	Non-VOC				
Sampling Connections[13]	VOC				
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC				
	Non-VOC				
Other	VOC				
	Non-VOC				

[1 - 13] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category “valves, gas service:” 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/CAS Number	OSHA Limits[2]		Acute[3] TC_{LO} - Animal LC_{LO} - Animal LC_{50} - Animal	Chronic[4]	Irritation[5]	References
	TWA	CL				

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available.
[4] Relying on animal or human studies, indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenecity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

REACTOR DATA SHEET

Provide the following information for each piece of equipment that is a potential or actual source of emissions as shown on the *Equipment List Form* and other parts of application.

Identification Number (as shown on *Equipment List Form*):

1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)
CONTINUOUS PYROLYSIS SYSTEM

2. Type of operation ☐ Batch ☑ Continuous ☐ Semi-batch

3. Projected Actual Equipment Operating Schedule (complete appropriate lines):

24	hrs/day	7	days/week	52	weeks/year
	hrs/batch		batches/day, weeks (Circle one)		day,weeks/yr (Circle one)

4. Feed Data Flow In = gal/hr, or gal/batch

Material Name & CAS No.	Phase[a]	Specific Gravity	Vapor Pressure[b]	Charge Rate Normal	Charge Rate Max	Charge Rate Units	Fill Time (min/batch, run)[c]
PLASTIC WASTE	S	0.32	0	2200 LBS/HR.		2	N/A

a. S = Solid, L = Liquid, G = gas or vapor
b. At feed conditions
c. Total time that equipment is filling per batch or run (start-up), for tank or vessel-type equipment.

5. Provide all **chemical reactions** that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.

6. Maximum Temperature	7A. Maximum Pressure 7B. Max. Set Pressure for venting	
°C	mmHg	mmHg
°F	psig	psig

8. Output Data Flow Out = gal/hr or gal/batch

Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate		
				Normal	Maximum	Units

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

☐ Check here if not applicable

Emission Point ID (exhaust point of header system):

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **

** MB - material balance: EE - Engineering Estimate: TM - Test Measurement (submit test data): O - other (Explain)

10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

☐ Check here if not applicable

10A. Cooling material

10B. Minimum and Maximum flowrate of cooling material (gal/hr)

10C. Inlet temperature of cooling material (°F)

10D. Outlet temperature of cooling material (°F)

10E. Pressure drop of gas to be condensed from inlet to outlet (psig)

10F. Inlet temperature of gas stream (°F)

10G. Outlet temperature of gas stream (°F)

10H. Number of passes

10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.):

☐ Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units:

%S % Ash BTU/lb, std. ft^3/day, gal

(circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used:

11F. Total maximum design heat input: $\times 10^6$ BTU/hr.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on *Equipment List Form*):

1. Name and type of equipment

#. Projected actual equipment operating schedule (complete appropriate lines):

hrs/day	days/week	weeks/year
hrs/batch	batches/day, batches/week (circle one)	days/yr, weeks/yr (circle one)

2. Number of stages (plates), excluding condenser

3. Number of feed plates and stage location

4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations

5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as R=L/D, where L = liquid down column, D = distillation product)

6. Specify the fraction of feed which is vaporized, f (where f is the molal fraction of the feed that leaves the feed plate continuously as vapor).

7A. Type of condenser used: ☐ total ☐ partial ☐ multiple ☐ other

7B. For each condenser provide process operating details including all inlet and outlet temperatures, pressures, and compositions.

8. Feed Characteristics
   A. Molar composition
   B. Individual vapor pressure of each component
   C. Total feed stage pressure
   D. Total feed stage temperature
   E. Total mass flow rate of each stream into the system

9. Overhead Product
   A. Molar composition of components
   B. Vapor pressure of components
   C. Total mass flow rate of all streams leaving the system as overhead products

10. Bottom Product
   A. Molar composition of all components
   B. Total mass flow rate of all steams leaving the system as bottom products

11. General Information
    A. Distillation column diameter
    B. Distillation column height
    C. Type of plates
    D. Plate spacing
    E. Murphree plate efficiency
    F. Any other information necessary of describe the operation of this distillation column.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
    Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

Attachment L
Emission Unit Data Sheet
(INDIRECT HEAT EXCHANGER)

Control Device ID No. (must match List Form): 1S and 2S, 1C and 2C

Equipment Information

1. Manufacturer: ARTI	2. Model No. Pyrolysis Heater Serial No. 1 and 2
3. Number of units: 2	4. Use - Heat Industrial Plastics to pyrolysis gas, pyrolysis oil and char residue
5. Rated Boiler Horsepower: N/A hp	6. Boiler Serial No.: N/A
7. Date constructed: Q3 2025	8. Date of last modification and explain: New
9. Maximum design heat input per unit: 2.6 ×10^6 BTU/hr	10. Peak heat input per unit: 3.5 ×10^6 BTU/hr
11. Steam produced at maximum design output: 0 N/A LB/hr psig	12. Projected Operating Schedule: Hours/Day 24 Days/Week 7 Weeks/Year 48
13. Type of firing equipment to be used: ☐ Pulverized coal ☐ Spreader stoker ☐ Oil burners ☒ Natural Gas Burner ☒ Others, specify -Pyrolysis Gas fuel	14. Proposed type of burners and orientation: ☐ Vertical ☐ Front Wall ☐ Opposed ☐ Tangential ☒ Others, specify EFGR External Flue Gas
15. Type of draft: ☒ Forced ☐ Induced	16. Percent of ash retained in furnace: 0 %
17. Will flyash be reinjected? ☐ Yes ☒ No	18. Percent of carbon in flyash: %

Stack or Vent Data

19. Inside diameter or dimensions: 14 inches ft.	20. Gas exit temperature: 460 °F
21. Height: 35 ft.	22. Stack serves: ☒ This equipment only ☐ Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
23. Gas flow rate: 699 / stack (2 stacks) ft^3/min	
24. Estimated percent of moisture: 15 to 30% on Pyro gas %	

Fuel Requirements

25.						
	Type	Fuel Oil No.	Natural Gas	Gas (other, specify)	Coal, Type:	Other:
	Quantity (at Design Output)	gph@60°F	ft^3/hr	3125/unit ft^3/hr	TPH	
	Annually	$\times 10^3$ gal	$\times 10^6$ ft^3/hr	50 $\times 10^6$ ft^3/hr	tons	
	Sulfur	Maximum: wt. % Average: wt. %	gr/100 ft^3	0 gr/100 ft^3	Maximum: wt. %	
	Ash (%)			0	Maximum	
	BTU Content	BTU/Gal. Lbs/Gal.@60°F	BTU/ft^3	1041 BTU/ft^3	BTU/lb	
	Source			Pyrolysis Process		
	Supplier			self produced		
	Halogens (Yes/No)			nil		
	List and Identify Metals			nil		

26. Gas burner mode of control:
☐ Manual ☒ Automatic hi-low
☐ Automatic full modulation ☐ Automatic on-off

27. Gas burner manufacture: ARTI

28. Oil burner manufacture:

29. If fuel oil is used, how is it atomized? ☐ Oil Pressure ☐ Steam Pressure ☐ Compressed Air ☐ Rotary Cup ☐ Other, specify

30. Fuel oil preheated: ☐ Yes ☐ No

31. If yes, indicate temperature: °F

32. Specify the calculated theoretical air requirements for combustion of the fuel or mixture of fuels described above actual cubic feet (ACF) per unit of fuel:
30253scfh /unit@ 55 °F, atm PSIA, 40 % moisture

33. Emission rate at rated capacity: 0.245/unit lb/hr

34. Percent excess air actually required for combustion of the fuel described: 15 assumed %

Coal Characteristics

35. Seams: N/A

36. Proximate analysis (dry basis): % of Fixed Carbon: N/A % of Sulfur:
% of Moisture: % of Volatile Matter:
% of Ash:

Emissions Stream

37. What quantities of pollutants will be emitted from the boiler before controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.12	0.020	460	atm
Hydrocarbons				
NO_x	0.12	0.020	460	atm
Pb				
PM_{10}	0.01	0.002	460	atm
SO_2				
VOCs	0	0	460	atm
Other (specify)				

38. What quantities of pollutants will be emitted from the boiler after controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.12	0.020	460	atm
Hydrocarbons				
NO_x	0.12	0.020	460	atm
Pb				
PM_{10}	0.01	0.002	460	atm
SO_2				
VOCs	0	0		
Other (specify)				

39. How will waste material from the process and control equipment be disposed of?

Any waste produced will be analyzed and placed in the proper disposal location.

40. Have you completed an *Air Pollution Control Device Sheet(s)* for the control(s) used on this Emission Unit. y

41. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet? partial

42. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING PLAN: Please list (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

Pyrolysis Unit 1 and 2 - Natural Gas or Pyrolysis Gas Fired Low NOx Burners

1. Emissions Monitoring
Continuous Emissions Monitoring Systems (CEMS): Fired heater management controls will be installed. Operations will continuously monitor fired heater performance with analyzers monitoring excess CO, O2, combustibles and firebox draft.
Stack Testing/Performance Tests: On initial startup and annually, emissions testing will be completed to demonstrate compliance with emission limits for CO, NOx, SO2, CO2, VOC and particulates.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

Operations will monitor pyrolysis gas for sulfur, Cl, and CO content daily using gas detection tubes or other methods. Operations will log these readings in operating logs and note trends. Annually the data will be summarized and included in the report to site management.
Pyrolysis Furnace Stack -monitor for particulates, NOx, CO and VOC
Pyrolysis Gas - monitor for the following S, Cl and CO.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

Emissions Records: Clean Seas will maintain records of testing daily and annual testing data, including CEMS data, stack test results, and calculations based on emission factors.
Operating Parameters: Records of daily operational parameters and trends, such as fuel usage, operating hours, and equipment settings will be maintained.
Maintenance Records: Records of maintenance and repairs performed on the burners and associated control equipment will be kept.
Compliance Records: Documentation of plant performance with respect to permitted limits and applicable regulations will be maintained at the plant site offices.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

Annual Emissions Inventory: A record of the annual emissions inventory will be reported to the WVDEP, detailing the monitoring of regulated pollutants emitted by the facility. This will include Malfunction and Upset Reports that resulted in emissions exceeding permit limits. Compliance Reports: Clean Seas will submit periodic compliance reports as specified in the permit discussing how the facility performed with respect to permitted limits.

43. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment L
Emission Unit Data Sheet
(INDIRECT HEAT EXCHANGER)

Control Device ID No. (must match List Form): 8S and 8C

Equipment Information

1. Manufacturer: ARTI -	2. Model No. TRE Pyrolysis Heater Serial No. TRE=Training, Research and Evaluation
3. Number of units: ONE (1)	4. Use - Trial Unit - Heat Industrial Plastics to pyrolysis gas, pyrolysis oil and char residue
5. Rated Boiler Horsepower: N/A hp	6. Boiler Serial No.: N/A
7. Date constructed: Undetermined, being rebuilt 3Q 2025	8. Date of last modification and explain: moved from ARTI shop in California to Belle WV for Training of operators, Research and Evaluation.
9. Maximum design heat input per unit: 0.200 $\times 10^6$ BTU/hr	10. Peak heat input per unit: 0.230 $\times 10^6$ BTU/hr
11. Steam produced at maximum design output: 0 N/A LB/hr psig	12. Projected Operating Schedule: Hours/Day 4-6 Days/Week 5 Weeks/Year approximately 50
13. Type of firing equipment to be used: ☐ Pulverized coal ☐ Spreader stoker ☐ Oil burners ☐ Natural Gas Burner ☒ Others, specify - Propane or Pyrolysis Gas fuel	14. Proposed type of burners and orientation: ☐ Vertical ☐ Front Wall ☐ Opposed ☐ Tangential ☒ Others, specify EFGR External Flue Gas
15. Type of draft: ☒ Forced ☐ Induced	16. Percent of ash retained in furnace: 0 %
17. Will flyash be reinjected? ☐ Yes ☒ No	18. Percent of carbon in flyash: %

Stack or Vent Data

19. Inside diameter or dimensions: 14 inches ft.	20. Gas exit temperature: 460 °F
21. Height: 35 ft.	22. Stack serves: ☒ This equipment only ☐ Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
23. Gas flow rate: 699 / stack (2 stacks) ft^3/min	
24. Estimated percent of moisture: 15 to 30% on Pyro gas %	

Fuel Requirements

25.						
	Type	Fuel Oil No.	Natural Gas	Gas (other, specify)	Coal, Type:	Other:
	Quantity (at Design Output)	gph@60°F	ft^3/hr	80 ft^3/hr	TPH	
	Annually	$\times 10^3$ gal	$\times 10^6$ ft^3/hr	0.08 $\times 10^6$ ft^3/hr	tons	
	Sulfur	Maximum: wt. % Average: wt. %	gr/100 ft^3	0.0097 gr/100 ft^3	Maximum: wt. %	
	Ash (%)			0	Maximum	
	BTU Content	BTU/Gal. Lbs/Gal.@60°F	BTU/ft^3	2516 BTU/ft^3	BTU/lb	
	Source			Propane		
	Supplier			TBD		
	Halogens (Yes/No)			nil		
	List and Identify Metals			nil		

26. Gas burner mode of control:
☐ Manual ☒ Automatic hi-low
☐ Automatic full modulation ☐ Automatic on-off

27. Gas burner manufacture: ARTI

28. Oil burner manufacture:

29. If fuel oil is used, how is it atomized? ☐ Oil Pressure ☐ Steam Pressure ☐ Compressed Air ☐ Rotary Cup ☐ Other, specify

30. Fuel oil preheated: ☐ Yes ☐ No

31. If yes, indicate temperature: °F

32. Specify the calculated theoretical air requirements for combustion of the fuel or mixture of fuels described above actual cubic feet (ACF) per unit of fuel:
30253scfh /unit@ 55 °F, atm PSIA, 40 % moisture

33. Emission rate at rated capacity: 0.245/unit lb/hr

34. Percent excess air actually required for combustion of the fuel described: 15 assumed %

Coal Characteristics

35. Seams: N/A

36. Proximate analysis (dry basis): % of Fixed Carbon: N/A % of Sulfur:
% of Moisture: % of Volatile Matter:
% of Ash:

Emissions Stream

37. What quantities of pollutants will be emitted from the boiler before controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.032	0.077	460	atm
Hydrocarbons				
NO_x	0.008	0.019	460	atm
Pb				
PM_{10}	0.001	0.002	460	atm
SO_2	0.00008	0.0002	460	atm
VOCs	0.001	0.002	460	atm
Other (specify)				

38. What quantities of pollutants will be emitted from the boiler after controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.032	0.077	460	atm
Hydrocarbons				
NO_x	0.006	0.014	460	atm
Pb				
PM_{10}	0.001	0.002	460	atm
SO_2	0.000080	0.0002	460	atm
VOCs	0.001	0.001	460	atm
Other (specify)				

39. How will waste material from the process and control equipment be disposed of?

Any waste produced will be analyzed and placed in the proper disposal location.

40. Have you completed an *Air Pollution Control Device Sheet(s)* for the control(s) used on this Emission Unit. y

41. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet? partial

42. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING PLAN: Please list (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

Pyrolysis Unit 1 and 2 - Natural Gas or Pyrolysis Gas Fired Low NOx Burners

1. Emissions Monitoring
Fired heater management controls will be installed. Operations will continuously monitor fired heater performance.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

Operations will monitor using gas detection tubes or other methods.
Operations will log these readings in operating logs and note trends.
Annually the data will be summarized and included in the report to site management.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

Emissions Records: Clean Seas will maintain records of testing.
Operating Parameters: Records of daily operational parameters and trends, such as fuel usage, operating hours, and equipment settings will be maintained.
Maintenance Records: Records of maintenance and repairs performed on the burners and associated control equipment will be kept.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

Annual Emissions Inventory: A record of the annual emissions inventory will be reported to the WVDEP, detailing the amount of fuel fired in the TRE and operating hours per year.

43. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment L
Emission Unit Data Sheet
(INDIRECT HEAT EXCHANGER)

Control Device ID No. (must match List Form): 7 S

Equipment Information

1. Manufacturer: Heatec (proposed)	2. Model No. HCI-3010-25G Serial No. N/A
3. Number of units: One (1)	4. Use Glycol circulation heater for warming lines, tanks, process, etc.
5. Rated Boiler Horsepower: N/A hp	6. Boiler Serial No.: N/A
7. Date constructed: TBD	8. Date of last modification and explain:
9. Maximum design heat input per unit: 2.5 ×10^6 BTU/hr	10. Peak heat input per unit: 2.5 ×10^6 BTU/hr
11. Steam produced at maximum design output: Zero (0) LB/hr psig	12. Projected Operating Schedule: Hours/Day 24 Days/Week 7 Weeks/Year 52
13. Type of firing equipment to be used: ☐ Pulverized coal ☐ Spreader stoker ☐ Oil burners ☒ Natural Gas Burner ☒ Others, specify - Pyrolysis Gas	14. Proposed type of burners and orientation: ☐ Vertical ☒ Front Wall ☐ Opposed ☐ Tangential ☐ Others, specify
15. Type of draft: ☒ Forced ☐ Induced	16. Percent of ash retained in furnace: 0 %
17. Will flyash be reinjected? ☐ Yes ☒ No	18. Percent of carbon in flyash: N/A %

Stack or Vent Data

19. Inside diameter or dimensions: 24 inches ft.	20. Gas exit temperature: 300 to 400 °F
21. Height: Approx 15 ft over adjacent structures, 32 ft.	22. Stack serves: ☒ This equipment only ☐ Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
23. Gas flow rate: 492 @ 350F ft^3/min	
24. Estimated percent of moisture: 10-15% NG, 15 to 30% Pyro Gas %	

Fuel Requirements

25.	Type	Fuel Oil No.	Natural Gas	Gas (other, specify)	Coal, Type:	Other:
	Quantity (at Design Output)	gph@60°F	2500 ft^3/hr	2500 ft^3/hr	TPH	
	Annually	$\times 10^3$ gal	22 $\times 10^6$ ft^3/hr	21.9 $\times 10^6$ ft^3/hr	tons	
	Sulfur	Maximum: wt. % Average: wt. %	4 gr/100 ft^3	0 gr/100 ft^3	Maximum: wt. %	
	Ash (%)				Maximum	
	BTU Content	BTU/Gal. Lbs/Gal.@60°F	1045 BTU/ft^3	1011 BTU/ft^3	BTU/lb	
	Source		Dominion Energy	Self Produced Pyrolysis Gas		
	Supplier		Dominion/Hope Gas	Self		
	Halogens (Yes/No)		no	nil		
	List and Identify Metals		no	nil		

26. Gas burner mode of control:
☐ Manual ☒ Automatic hi-low
☐ Automatic full modulation ☐ Automatic on-off

27. Gas burner manufacture: Heatec

28. Oil burner manufacture: N/A

29. If fuel oil is used, how is it atomized? ☐ Oil Pressure ☐ Steam Pressure ☐ Compressed Air ☐ Rotary Cup ☐ Other, specify

30. Fuel oil preheated: ☐ Yes ☐ No

31. If yes, indicate temperature: °F

32. Specify the calculated theoretical air requirements for combustion of the fuel or mixture of fuels described above actual cubic feet (ACF) per unit of fuel:
@ °F, PSIA, % moisture

33. Emission rate at rated capacity: lb/hr

34. Percent excess air actually required for combustion of the fuel described: %

Coal Characteristics

35. Seams:

36. Proximate analysis (dry basis): % of Fixed Carbon: % of Sulfur:
% of Moisture: % of Volatile Matter:
% of Ash:

Emissions Stream

37. What quantities of pollutants will be emitted from the boiler before controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.400	0.095	350	Atm
Hydrocarbons	nil			
NO_x	0.100	0.024		
Pb	nil			
PM_{10}	0.018	0.004		
SO_2	0.00234	0.0006		
VOCs	.015	0.003		
Other (specify)	Natural Gas Fuel			
		492 ft3/min		
		29520 ft3/hr		
Note- These are estimated	Manufacturer data not	used in estimates		

38. What quantities of pollutants will be emitted from the boiler after controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO	0.400	0.095	350	Atm
Hydrocarbons	nil			
NO_x	0.075	0.018		
Pb	nil			
PM_{10}	0.018	0.004		
SO_2	nil			
VOCs	0.015	0.003		
Other (specify)	Pyrolysis Gas Fuel			
Note;these are estimated	based on the pyro gas	and low NOx burner		
data will be updated with	manufacturer data	once purchased		

39. How will waste material from the process and control equipment be disposed of?

Any waste produced will be analyzed or assesed and properly disposed of.

40. Have you completed an *Air Pollution Control Device Sheet(s)* for the control(s) used on this Emission Unit. y

41. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet? partially

42. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING PLAN: Please list (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

Operator monitoring of heater performance. Initial performance testing to demonstrate compliance with permit emission limits. Annual stack testing or as required by permitting. Periodic monitoring as recommended by the manufacturer.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

Maintain records of operational hours, fuel usage (natural gas or pyrolysis gas) and maintenance activities. Records deviations from normal operations or emissions limits.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

Document emissions data, including results from any required testing or monitoring.
Maintain records of any exceedances of emission limits.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

Annual Emission Inventory and Compliance Report
Submit an annual emission inventory report to the WVDEP, detailing emissions from the glycol heater and other sources. Submit periodic compliance reports as specified in the operating permit, which may include results from emission testing and monitoring, excursions and incidents. Notify the WVDEP of any deviations from permit conditions or emissions limits, including any malfunctions or breakdowns.

43. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

This section will be completed when the equipment is purchased.

Attachment L
Emission Unit Data Sheet
(INDIRECT HEAT EXCHANGER)

Control Device ID No. (must match List Form):

Equipment Information

1. Manufacturer: Howard Engineering	2. Model No. Serial No.
3. Number of units: 3 Engineering in progress	4. Use Cooling gases using water
5. Rated Boiler Horsepower: N/A hp	6. Boiler Serial No.: Not a boiler, heat exchangers
7. Date constructed:	8. Date of last modification and explain:
9. Maximum design heat input per unit: $\times 10^6$ BTU/hr	10. Peak heat input per unit: $\times 10^6$ BTU/hr
11. Steam produced at maximum design output: LB/hr psig	12. Projected Operating Schedule: Hours/Day Days/Week Weeks/Year
13. Type of firing equipment to be used: ☐ Pulverized coal ☐ Spreader stoker ☐ Oil burners ☐ Natural Gas Burner ☐ Others, specify	14. Proposed type of burners and orientation: ☐ Vertical ☐ Front Wall ☐ Opposed ☐ Tangential ☐ Others, specify
15. Type of draft: ☐ Forced ☐ Induced	16. Percent of ash retained in furnace: %
17. Will flyash be reinjected? ☐ Yes ☐ No	18. Percent of carbon in flyash: %

Stack or Vent Data

19. Inside diameter or dimensions: ft.	20. Gas exit temperature: °F
21. Height: ft.	22. Stack serves: ☐ This equipment only ☐ Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
23. Gas flow rate: ft^3/min	
24. Estimated percent of moisture: %	

Fuel Requirements

25.	Type	Fuel Oil No.	Natural Gas	Gas (other, specify)	Coal, Type:	Other:
	Quantity (at Design Output)	gph@60°F	ft^3/hr	ft^3/hr	TPH	
	Annually	$\times 10^3$ gal	$\times 10^6$ ft^3/hr	$\times 10^6$ ft^3/hr	tons	
	Sulfur	Maximum: wt. % Average: wt. %	gr/100 ft^3	gr/100 ft^3	Maximum: wt. %	
	Ash (%)				Maximum	
	BTU Content	BTU/Gal. Lbs/Gal.@60°F	BTU/ft^3	BTU/ft^3	BTU/lb	
	Source					
	Supplier					
	Halogens (Yes/No)					
	List and Identify Metals					

26. Gas burner mode of control:
☐ Manual ☐ Automatic hi-low
☐ Automatic full modulation ☐ Automatic on-off

27. Gas burner manufacture:

28. Oil burner manufacture:

29. If fuel oil is used, how is it atomized? ☐ Oil Pressure ☐ Steam Pressure ☐ Compressed Air ☐ Rotary Cup ☐ Other, specify

30. Fuel oil preheated: ☐ Yes ☐ No

31. If yes, indicate temperature: °F

32. Specify the calculated theoretical air requirements for combustion of the fuel or mixture of fuels described above actual cubic feet (ACF) per unit of fuel:
@ °F, PSIA, % moisture

33. Emission rate at rated capacity: lb/hr

34. Percent excess air actually required for combustion of the fuel described: %

Coal Characteristics

35. Seams:

36. Proximate analysis (dry basis): % of Fixed Carbon: % of Sulfur:
% of Moisture: % of Volatile Matter:
% of Ash:

Emissions Stream

37. What quantities of pollutants will be emitted from the boiler before controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO				
Hydrocarbons				
NO_x				
Pb				
PM_{10}				
SO_2				
VOCs				
Other (specify)				

38. What quantities of pollutants will be emitted from the boiler after controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA
CO				
Hydrocarbons				
NO_x				
Pb				
PM_{10}				
SO_2				
VOCs				
Other (specify)				

39. How will waste material from the process and control equipment be disposed of?

40. Have you completed an *Air Pollution Control Device Sheet(s)* for the control(s) used on this Emission Unit.

41. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet?

42. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING PLAN: Please list (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

43. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 5 E 5 S

1. Name or type and model of proposed affected source:

   Generac SG150 229 BHP, 150kWh, 2042 scfh NG @ full load

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   Natural Gas fueled 150 kW Generac electric generator for power supply during power outages to enable safe plant shutdown.
   Fuel rate 2042 scfh Natural Gas at full rate.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   150 kW Electricity
   Generator engine exhaust

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   Combustion of natural gas and air to electricity, CO2, H2O, NOx, CO, SO2, VOC, PM

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

2042 scfh natural gas at full power for power supply backup approximately 14 hours per year. Minimal natural gas for a weekly test run every week for one (1) hour - 52 hours/yr.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natuarl gas composed of Methane with Sulfur odorant concentration of appromately 4 ppm.

(c) Theoretical combustion air requirement (ACF/unit of fuel):

14.5 ft3 air @ 60 °F and Atm psia.

(d) Percent excess air: 15% estimated not from Generac data sheet

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Generac Piston Engine powered generator

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: 2.042 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	Days/Week 1	Weeks/Year 52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 1440 °F and 14.73 psia

a.	NO_X	0.894	lb/hr	0.079	grains/ACF
b.	SO_2	0.0023	lb/hr	0.0002	grains/ACF
c.	CO	0.878	lb/hr	0.078	grains/ACF
d.	PM_{10}	nil	lb/hr	nil	grains/ACF
e.	Hydrocarbons	0.252	lb/hr	0.023	grains/ACF
f.	VOCs	included in e	lb/hr		grains/ACF
g.	Pb	nil	lb/hr	nil	grains/ACF
h.	Specify other(s)				
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
The site will record the annual hours of operation including non-emergency usage such as maintenance checks and testing. The site will test run the generator once per week for approximately and hour. Natural Gas Fuel Usage: Record the quantity of natural gas consumed by the generator.	Operating Logs: Clean Seas will maintain records of the dates, times, and duration of all emergency and non-emergency operations. Fuel Purchase Records: The site will keep records of natural gas purchases to document fuel consumption. Maintenance Records: Document all maintenance and repairs performed on the generator. Manufacturer Specifications: Keep records of the generator's manufacturer's specifications and compliance demonstrations
REPORTING	**TESTING**
Reporting Annual Emission Reports: Submit reports detailing the generator's emissions of regulated air pollutants, often using the DEP's emissions inventory system or required forms. Compliance Certifications and Deviation Reports: Submit periodic certifications of compliance with the permit conditions. Report any deviations from permit conditions or regulations, such as exceeding operational hour limits or emission limits.	Emission Limits: The manufacturer has performed testing on the generator and has reported the emissions of nitrogen oxides (NOx), carbon monoxide (CO), CO2, PE, sulfur dioxide (SO2), and volatile organic compounds (VOCs) based on natural gas fuel. Initial and period testing will be used to demonstrate compliance with these emission limits.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

Oil Spill Response Procedure

Clean Seas West Virginia

Oil spill response procedure for a plastics pyrolysis plant producing 3960000gal/yr oil heavier than diesel fuel. 8 21000 gal frac tanks, truck loading rack loading 2 to 3 trucks per day 5 days per week, located in west virginia near Belle, WV.

Immediate Spill Response Actions

1. **Stop the Source:** Shut off pumps, close valves, and isolate the leaking equipment.

2. **Containment:** Deploy booms and absorbent pads around the tank, rack, or transfer area to prevent migration.

3. **Recovery:** Use skimmers, vacuum trucks, or sorbent materials to remove free oil from paved surfaces or containment areas.

4. **Secure Waste:** Place recovered oil and oily materials into labeled, sealable containers for proper disposal.

Spill Prevention & Preparedness

Effective prevention minimizes the need for response.

Training & Drills

- Conduct quarterly drills simulating a 21,000-gal tank release.

- Train all operators in valve shutdown, emergency contact procedures, and use of spill kits.

Equipment & Facilities

- Maintain **eight 21,000-gal** frac tanks with secondary containment rated at **110%** of single-tank capacity.

- Install high-level alarms on each tank and truck loading rack.

- Keep spill kits (absorbents, neutralizers, booms) within **100 ft** of loading areas.

- Ensure all transfer hoses and fittings are inspected monthly and replaced every two years or upon signs of wear.

Notification & Reporting

Internal Notifications

- Immediately alert the Plant Shift Supervisor and EHS Manager.

- Activate the on-call response team and Chemtrec 1-800-424-9300 or local 1-703-527-3887 within **15 minutes** of spill discovery.

External Notifications

- If spill ≥ 25 gal reaches soil or waters of the state, notify West Virginia Department of Environmental Protection (DEP) Spill Hotline: **(800) 642-3074**.

- If spill threatens navigable waters, notify U.S. Coast Guard National Response Center: **(800) 424-8802**.

- Submit a written incident report to WV DEP within **15 days**.

Spill Response Plan Components

Site Map & Tank Inventory

- Clearly mark all frac tanks, transfer lines, loading racks, and nearby waterways (e.g., Belle vicinity drainage).

Resource List

- Contact information for cleanup contractors, waste disposal facilities, and equipment vendors.

- Inventory of on-site spill response gear, including:

  • 500 ft of containment boom

  • 1,000 sorbent pads

- 2 vacuum pumps (2,000 gal/hr capacity)

Action Flowchart

1. Detection & Alarm

2. Source Shutdown

3. Containment

4. Recovery & Cleanup

5. Waste Management

6. Incident Evaluation & Reporting

Post-Spill Evaluation & Continuous Improvement

- Conduct root-cause analysis within **7 days** of spill resolution.

- Update standard operating procedures and retrain staff on identified gaps.

- Review and restock spill kits immediately after each event, ensuring readiness for the next incident.

Attachment M
Air Pollution Control Device Sheet
(CONDENSER SYSTEM)

Control Device ID No. (must match Emission Units Table):

Equipment Information and Filter Characteristics

1. Manufacturer: Howard Engineering Model No.	2. Method: ☐ Pressure condensation ☑ Temperature condensation ☐ Surface ☐ Contact ☐ Other, specify
3. Control Device Name: Condensor	
4. Provide diagram of condenser: Engineering in progress	
5. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency. Type text here	
6. Heat exchanger area: 393 ft^2 ft^3	7. Reported removal efficiency: N/A %
8. Coolant Used: 50/50 water and glycol	9. Refrigeration capacity: Ref. One tons
10. Composition of coolant: See above item 8	11. Internal operating temperature: °F 42F
12. Specific heat of coolant: 0.75 BTU/lb.°F, at 77°F	13. Temperature of condensation: 55 °F
Average Operation:	**Maximum Operation:**
14. Coolant Temperature: Inlet: 42 °F Outlet: 52 °F	15. Coolant Temperature: Inlet: 42 °F Outlet: 52 °F
16. Gas Temperature: Inlet: 85 °F Outlet: 55 °F	17. Gas Temperature: Inlet: 90 °F Outlet: 60 °F
18. Gas flow rate: 176 ft^3/min	19. Gas flow rate: 200 ft^3/min
20. Coolant flow rate per condenser: Type: Water: 2.4 gal/min Air: ft^3/min Other: lb/hour	21. Coolant flow rate per condenser: Type: Water: 2.4 gal/min Air: ft^3/min Other: lb/hour
22. Efficiency of condenser: 80 %	23. Efficiency of condenser: 80 %
24. Condenser surface area: 393 ft^2	25. Condenser surface area: 393 ft^2

26. Pollutant	Guaranteed Minimum Control Efficiency %	Concentration ppmv	Specific Heat BTU/lb-mol °F	Heat of Vaporation BTU/lb-mol
A N/A				
B				
C				
D				
E				
F				
G				
Total Concentration in ppmv				

Emission Gas (Vapor) Stream

27. **Before Condenser**	28. **After Condenser**
Inlet vapor flow rate: N/A ft^3/min	Inlet vapor flow rate: ft^3/min
Influent vapor temperature: °F	Influent vapor temperature: °F
Effluent vapor temperature: °F	Effluent vapor temperature: °F

29. Pollutant	INLET			OUTLET		
	Vapor Pressure	Condensation Temperature	Rate lb/hr	Rate lb/hr	Vapor Pressure	Condensation Temperature
A N/A						
B						
C						
D						
E						
F						
G						
Total of the POLLUTANT lb/hr						

30. Moisture content: %

31. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

32. Describe the collection material disposal system:

33. Have you included ***Condenser Control Device*** in the Emissions Points Data Summary Sheet?

34. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
Routine monitoring	
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

35. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

36. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

37. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table):

Equipment Information

1. Manufacturer: ARTI
   Model No. ARTFB10

2. Method: ☐ Elevated flare ☑ Ground flare ☐ Other
   Describe

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
   ☐ Steam-assisted ☑ Air-assisted ☐ Pressure-assisted ☐ Non-assisted

5. Maximum capacity of flare:
   350 scf/min
   21000.00 scf/hr

6. Dimensions of stack:
   Diameter 1.33 ft.
   Height 15.00 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   Estimated: 99.99 %
   Minimum guaranteed: 99.9 %

8. Fuel used in burners:
   ☐ Natural Gas
   ☐ Fuel Oil, Number
   ☑ Other, Specify: Pyro gas from plastic

9. Number of burners: One
   Rating: 10,000,000.00 BTU/hr

10. Will preheat be used? ☐ Yes ☑ No

11. Describe method of controlling flame:

12. Flare height: Enclosed flare box ft

13. Flare tip inside diameter: 14 Inches ft

14. Natural gas flow rate to flare pilot flame per pilot light: 75 scf/min
    scf/hr

15. Number of pilot lights: One
    Total 450,000.00 BTU/hr

16. Will automatic re-ignition be used?
    ☑ Yes ☐ No

17. If automatic re-ignition will be used, describe the method: Flow sensing system

18. Is pilot flame equipped with a monitor? ☑ Yes ☐ No
    If yes, what type? ☐ Thermocouple ☐ Infra-Red
    ☑ Ultra Violet ☑ Camera with monitoring control room
    ☐ Other, Describe:

19. Hours of unit operation per year:

Steam Injection

20. Will steam injection be used? ☐ Yes ☑ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Pyro Gas	0	21,000.00 ft^3/hr.	Pyrolysis system

30. Estimate total combustible to flare: 750 to 1300 lbs./hr. LB/hr or ACF/hr
(Maximum mass flow rate of waste gas) scfm

31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:
750 tp 1300 lbs./hr. LB/hr or ACF/hr

32. Give composition of carrier gases: 30% hydrogen, 35% CH4 20% CO 5%CxHy 5% Nitrogen 2% Oxygen 3% CO2

33. Temperature of emission stream: 100 °F Heating value of emission stream: 1000 BTU/ft^3 Mean molecular weight of emission stream: MW = 28.5 lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. See above analysis BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 1800 °F	36. Flare gas flow rate: 350 scf/min
37. Flare gas heat content: BTU/ft^3	38. Flare gas exit velocity: scf/min

39. Maximum rate during emergency for one major piece of equipment or process unit: 175 scf/min

40. Maximum rate during emergency for one major piece of equipment or process unit: 1750 BTU/min

41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification): ARTI low emission burner. Below 50 PPM CO and below 80 PPM NOx emissions.

42. Describe the collection material disposal system: Emergency flare is only used about 24 times/yr for maximum of 6 hours total for a SU/SD cycle

43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet? Yes

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Stack analyzer data collection	RECORDKEEPING: Data recorder and strip printout with date and time.
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
ARTI guarantees that the above mensioned emissions at the worse operating condiction will be performed by the flare burenr. Flare burner will be fired in an insulated box and no flame will be seen outside of the box. Flame will be totally contained within the box and the combustion will completed as in a boiler.

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
Burner shall perfrom below all emission levels mensioned above.

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Burner shall automatically modulate per flow sensing system to keep proper air/fuel ratios to keep clean combustion.

Attachment I

Emissions Unit Table

(includes all emission units and air pollution control device that will be part of this permit aplication review, regardles of permit status)

Emissions Unit ID	Emissions Point ID	Emissions Units Description	Year Installed / Modified	Design Capacity	Type and Date of Change	Control Device
1S	1E	Pyrolysis Unit #1	TBD	3 mmBTU/Hr	New	1C
2S	2E	Pyrolysis Unit #2	TBD	3 mmBTU/Hr	New	2C
3S	3E	Flare	TBD	1-5 mmBTU/Hr	New	3C
4S	4E	Frac Tanks (8 total)	TBD	21,000 gal/tk	New	4C
5S	5E	Generator Nat Gas Fuel	TBD	150 kWh	New	5C
6S	6E	Truck Loading Rack	TBD	15k gal/day	New	6C
7S	7E	Gycol Circulation Heater	TBD	2.5 mmBTU/Hr	New	7C
8S	8E	TRE- Training, Research & Eval	TBD	0.2mmBTU/Hr	New	8C
9S	9E	TRE- Flare	TBD	0.1 mmBTU/Hr	New	9C

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Test Data provided by ARTI

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[3] (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)	Type Text here	lb/hr	ton/yr	lb/hr	ton/yr			
1E	UPWARD STACK	1S	BURNER	1C	ANALYZER	C	8,000	NOx CO PE VOC	.12 .12 .0015 0.0	0.872 0.872 0.010 0.000	0.12 0.12 0.005 0.000	0.872 0.872 0.010 0.000	GAS	ST	30 PPM 50 PPM 0.005LB/MMBTU 0.0 PPM
2E	UPWARD STACK	2S	BURNER	2C	ANALYZER	C	8,000	NOx CO PE VOC	.12 .12 .0015 0.0	0.872 0.872 0.010 0.000	0.120 0.120 0.005 0.000	0.436 0.436 0.005 0.000	GAS	ST	30 PPM 50 PPM 0.005 LB/MMBTU 0.0 PPM
3E	UPWARD STACK	3S	BURNER	3C	ANALYZER	note A	144	NOx CO PE VOC	0.240 0.240 0.003 0.000	0.047 0.047 0.0 0.0	0.240 0.240 0.003 0.000	0.047 .013 0.00 0.00	GAS	ST	30 PPM 50 PPM 0 PPM 0 PPM
4E	Upward Vent to Flare	4S	Press vac vent	4C	Process Monitoring	To Flare	N/A	VOCs	TBD	TBD	TBD	TBD	Vapor/N2 to flare	EE	TBD
5E	Upward Stack	5S	Natural gas engine	5C	Catalytic Converter	During Power Outage	70	NOx CO PE VOC	0.894 0.878 Nil 0.252	0.030 0.029 Nil 0.008	0.050 0.374 Nil 0.071	0.002 0.012 Nil 0.002	Gas	ST	TBD
6E	Vapor to Tank	6S	Vapor Line From Truck	6C	vapor contain-ment	During Truck Loading	1,500	VOCs	TBD	TBD	TBD	TBD	Gas	EE	TBD
7E	Upward Stack	7S	Burner	7C	Low NOx Burners	Heat for Process Tanks / Lines	8,760	NOx CO PE VOC	0.100 0.400 0.018 0.015	0.438 1.752 0.077 0.066	0.075 0.400 0.018 0.015	0.329 1.752 0.077 0.066	Gas	EE	TBD
8E	Upward Stack	8S	TRE Burner	8C	Samples During Trials	Test & Training 4 days / week	1,000	NOx CO PE VOC	0.008 0.032 0.001 0.001	0.035 0.140 0.006 0.005	0.006 0.032 0.001 0.001	0.026 0.140 0.006 0.005	Gas	EE	TBD
9E	Upward Stack	9S	TRE Flare	9C	Samples During Trials	Test & Training 4 days / week	1,000	NOx CO PE VOC	0.004 0.016 0.001 0.001	0.002 0.008 0.000 0.001	0.004 0.016 0.001 0.001	0.002 0.008 0.000 0.001	Gas	EE	TBD

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Note A Flare operational for approximately 2x/mo for 6 hrs each SU/SD event for 144hrs/yr

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1S	14 INCHES	460	1700	26.5	1500 FT	35 FT		
2S	14 INCHES	460	1700	26.5	1500 FT	35 FT		
3S	24 INCHES	1800	11820	62.0	1500 FT	35 FT		
4S	TBD	1440	TBD	1500FT	TBD			
5S	TBD	TBD	TBD	1500FT	TBD			
6S	TBD	TBD	TBD	TBD	1500FT	TBD		
7S	TBD	TBD	TBD	TBD	1500FT	TBD		
8S	TBD	TBD	TBD	TBD	1500FT	TBD		
9S	TBD	TBD	TBD	TBD	1500FT	TBD		

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

		density	lbs/hr	F
Pyrolyzer 1 25 metric Tons/Day; Furnace/Reactor 1; nat gas fired			2200	70
	liq/gas out		1980	1000
	solid out		220	1000
Particle Wash 1A -PSV	liq/gas in		1980	1000
	cooling oil in		7220	110
	liq out		7620	260
	gas out		1580	260
Particle Wash 1B- PSV				
Heat Exchanger 1A/B; C/W	gas in		1580	260
	gas out		442	130
	liq out		1138	130
Heat Exch 1C; PSV; Refrigeration	gas in		442	130
	liq out		2	60
	gas out		440	60
Vacuum Pump 1A/B			440	60
Pyro Gas KO & Demister 1				
Cooling Tower 1; no emissions				
Spray Diesel/Oil Cooler 1-	oil in		7220	260
	oil out		7220	110
Compressor -PSV?			440	
Portable Tanks(8 tanks) pyrolysis oil, N2 blanketed				
Shredder, Conveyors, Material Handling lbs/hr			4400	
			4400	
Frac Tanks(8 tanks) pyrolysis oil, N2 blanketed				

Burners- CO2 Emissions

Pyro Gas	btu/scf	641			
			Assume %		
Al Pyro gas composition	H2	20-40%	34	325	btu/scf
	CO	35-40%	40	325	btu/scf
	C1 / C2	19%	19	1011/1783	btu/scf
	CO2	5-15%	7	0%	
	N2		0	0	
			100		
			Estimated	449	btu/scf

CO2 Emissions 365 x 0.92 x 5700/2200 = 870 tons/yr

	3125	scfh/skid	
	8.24538259	lbmoles/hr	
C from CO	3.29815303	lbmoles/hr	
C from C1	1.09663588		70% CH4
C from C2	0.46998681		30% C2H6
CO2 from gas	0.57717678		
Total C	5.44195251	lbmoles/hr	
Mole wt CO2	44	lb/lbmole	
CO2	239.44591	lb/hr CO2/skid	
Annual CO2	**1930**	**tons/yr**	

239.4X24hrsX2skidsX365 days X .92 onstream/2000lb/ton = 1930 tons/yr

Annual CO2 Emissions from

Burners	**1930**	**tons/yr**
Flare	**262**	
Generator	**233**	
Total	**2425**	**tons/yr**

Flare

Here are the actual emissions expected from the combustion of the pyro gases:

NOx emissions = <30 PPM corrected to 3.0% oxygen

CO emissions = < 50 PPM corrected to 3.0 % oxygen

SOx emissions = < 15 PPM corrected to 3.0% excess oxygen

PE Emission = < .0005 lbs./MMBTU

Flare	262	tons/yr	450000 btu/hr
Pilot Gas			116.65 lbs CO2 emissions /1mm btu Nat Gas
btu/hr	450,000		450000btu/hr X 8760hrs/yr X 116.65 lb CO2 /1 mmbtu Nat Gas /2000lb/ton
CO2	230	tons/yr	229.91715 tons/yr

6 hr Pyro flaring 2 times per month

1930/(365*24)*12*2*6 = 32 tons/yr CO2

Pumps- Pyrolyzer 1- 6 oil pumps

Safety Valves for Pyrolyzer 1

Truck Loading Rack

4mm gallons/yr

6000 gal/truck

15385	gal/workday
3957642.9	gal/yr
2.6	trucks/day
12.8	trucks/week
50.0	loading rate gpm
307.7	loading time minutes
5.1	hrs Loading time/day
1333.3	Annual loading hours

		density lbs/hr	F
		lbs/hr	
Pyrolyzer 1 25 metric Tons/Day;		2200	70
Furnace/Reactor 1; nat gas fired			
	liq/gas out	1980	1000
	solid out	220	1000
Particle Wash 1A -PSV	liq/gas in	1980	1000
	cooling oil in	7220	110
	liq out	7620	260
	gas out	1580	260
Particle Wash 1B- PSV			
Heat Exchanger 1A/B; C/W	gas in	1580	260
	gas out	442	130
	liq out	1138	130
Heat Exch 1C; PSV; Refrigeration	gas in	442	130
	liq out	2	60
	gas out	440	60
Vacuum Pump 1A/B		440	60
Pyro Gas KO & Demister 1			
Cooling Tower 1; no emissions			
Spray Diesel/Oil Cooler 1-	oil in	7220	260
	oil out	7220	110
Compressor -PSV?		440	
Chiller 5 Ton - Refrigerant? Design?			
Frac Tanks(8 tanks) pyrolysis oil, N2 blanketed			
Shredder, Conveyors, Material Handling lbs/hr		4400	
Dust Collection System cubic feet per minute		4400	
	Filter Surface 75 M^2		
	Filter Sections 3 x 25 M^2		
	Dust Emissions < 1.0 mg/M^3		
Frac Tanks(8 tanks) pyrolysis oil, N2 blanketed			

Burners- CO2 Emissions

Pyro Gas	btu/scf	641			
			Assume %		
Al Pyro gas composition	H2	20-40%	34	325	btu/scf
	CO	35-40%	40	325	btu/scf
	C1 / C2	19%	19	1011/1783	btu/scf
	CO2	5-15%	7	0%	
	N2		0	0	
			100		
			Estimated	449	btu/scf

CO2 Emissions 365 x 0.92 x 5700/2200 = 870 tons/yr

	3125	scfh/skid
	8.24538259	lbmoles/hr
C from CO	3.29815303	lbmoles/hr
C from C1	1.09663588	70% CH4
C from C2	0.46998681	30% C2H6
CO2 from gas	0.57717678	
Total C	5.44195251	lbmoles/hr
Mole wt CO2	44	lb/lbmole
CO2	239.44591	lb/hr CO2/skid
Annual CO2	**1930**	**tons/yr**

239.4X24hrsX2skidsX365 days X .92 onstream/2000lb/ton = 1930 tons/yr

Annual CO2 Emissions from		
Burners	**1930**	**tons/yr**
Flare	**262**	
Generator	**#REF!**	
Total	#REF!	tons/yr

Flare

Here are the actual emissions expected from the combustion of the pyro gases:

NOx emissions = <30 PPM corrected to 3.0% oxygen

CO emissions = < 50 PPM corrected to 3.0 % oxygen

SOx emissions = < 15 PPM corrected to 3.0% excess oxygen

PE Emission = < .0005 lbs./MMBTU

Flare	262	tons/yr	450000 btu/hr
Pilot Gas			116.65 lbs CO2 emissions /1mm btu Nat Gas
btu/hr	450,000		450000btu/hr X 8760hrs/yr X 116.65 lb CO2 /1 mmbtu Nat Gas /2000lb/ton
CO2	230	tons/yr	229.91715 tons/yr

6 hr Pyro flaring 2 times per month

1930/(365*24)*12*2*6 = 32 tons/yr CO2

Pumps- Pyrolyzer 1- 6 oil pumps

Safety Valves for Pyrolyzer 1

Truck Loading Rack

4mm gallons/yr

6000 gal/truck

15385	gal/workday
3957642.857	gal/yr
2.564102564	trucks/day
12.82051282	trucks/week

Flare	**262 tons/yr**	450000	btu/hr
Pilot Gas		116.65	lbs CO2 emissions /1mm btu Nat Gas
btu/hr	450,000	450000btu/hr X 8760hrs/yr X 116.65 lb CO2 /1 mmbtu Nat Gas /2000lb/ton	
CO2	230 tons/yr	229.91715	tons/yr
6 hr Pyro flaring 2 times per month			
1930/(365*24)*12*2*6 = 32 tons/yr CO2			

Emissions:

Capacity	10,000,000.00	Btu/hr.	Pilot	450,000 btu/hr	230 CO2 Tons/yr
Heating value of the gas	800	Btu/ft^3	Burner Pyro Gas	6250 scfh	
Gas density	0.052	lbs./ft^3		478 lb CO2/hr	34 CO2 Tons/yr
Heating value of gas	15384.61538	Btu/lb.	Flare CO2 Emissions		264
Air/fuel ratio	17.3	lbs./lb.			
Air/fuel ratio at 15.0% excess air	19.895	lbs./lb.			
Gas flow at max. operation	650.00	lbs./hr.			
air flow at max. operation	12931.75	lbs./hr.			
Stack flow max. operation	13581.75	lbs./hr.			
Carbon monoxide emissions Corrected to 3% Oxygen	50	PPM			
NOX emissions corrected to 3% Oxygen	80	PPM			
CO2 emissions	5.6	%			
NOX emissions flow	0.008	%			
CO emissions flow	0.005	%			
NOx mass flow at max. operation	1.08654	lbs/hr.			
CO mass flow at max. operation	0.6790875	lbs/hr.			
CO2 emissions max. operation	760.578	lbs/hr.			

Max. Operating time per year		80	hours	144 2 times/month X 12 Months X 6 hrs/event
Max. NOx emissions		**86.9232**	**lbs./year**	
Max. CO emissions		**54.327**	**lbs/year**	
Max. CO2 emissions		**60846.24**	**lbs./year**	30.42312 Tons/yr
Pilot Emissions 450,000 btu/hr	8760 hrs/yr	116.65	lbs CO2/mm btu NG	229.91715 Tons/yr
				260.34027

Uncontrolled Generator Estimate 84.8 lbs/hr Nat Gas 2285 lbs/hr at 15% excess air

150kWh 229 BHP, 150kWh, 2042 scfh NG @ full load, **Exhaust -NO catalytic emissions control** at 229 BHP

CO2 Carbon Dioxide 216-240 lbs/150 kWh Exhaust flow rate 2285 lbs/hr at 15% excess air (estimated)

CO Carbon Monoxide CO2 Carbon Dioxide 232 lbs/150 kWh

On Demand for power outage or testing 1.74 gms/HP-hr

0.878 lbs/150 kWh demand 0.029 CO tons/yr

CO Calc = 1.74gms/HP-hr X 229Hp / 453.6 gms/lb 0.878 lbs/hr at full power

NOx Nitrogen oxides

1.77 gms/bhp-hr

0.0505 lbs/150 kWh demand 0.030 NOx tons/yr

NOx Calc = 1.77gms/HP-hr X 229Hp / 453.6 gms/lb 0.894 lbs/hr at full power

THC Estimate - 0.5 Grams/bhp-hr 0.008 THC tons/yr

0.252 lbs/hr at full power (estimated)

PM Particulate matter - No significant PM

Annual CO2tons/yr 6.0 Testing CO2/yr - 232 lbs/operating hr X 1hr/week testing X 52 wks/yr/2000 lbs/ton

PM Particulate matter - No significant PM

Generac SG150 229 BHP, 150kWh, 2042 scfh NG @ full load, **Exhaust -catalytic emissions control** T =1440F, flow= 1206 cfm, press= 0.75 in HG at 229 BHP

CO2 Carbon Dioxide 233 lbs/150 kWh Exhaust flow rate 2285 lbs/hr at 15% excess air (not from Generac data sheet-estimated)

CO Carbon Monoxide CO2 Carbon Dioxide 233 lbs/150 kWh

0.74 gms/bhp-hr

0.374 lbs/150 kWh demand 0.012 CO tons/yr

CO Calc = 0.74 gms/bhp-hr X 229 BHP /(453.6 gms/lb) 0.374 lbs/hr at full power

NOx Nitrogen oxides

0.10 gms/bhp-hr

0.0505 lbs/150 kWh demand 0.002 NOx tons/yr

NOx Calc = 0.10 gms/bhp-hr X 229 BHP /(453.6 gms/lb) 0.050 lbs/hr at full power

THC Estimate - 0.14 Grams/bhp-hr 0.002 THC tons/yr

0.071 lbs/hr at full power (estimated)

PM Particulate matter - No significant PM

Annual CO2tons/yr 6.1 Testing CO2/yr - 233 lb: PM Particulate matter - No significant PM

Att N Generac EPA Statement.pdf

Att N Generac Exhaust Emissions.pdf

Att N Generac Spec Sheet.pdf

Generator emissions no catalytic control.docx

Nat Gas Glycol Heater Estimate	2285 lbs/hr at 15% excess air (estimated)	1277.778 Tons/yr CO2	
max 4 mmbtu/hr normal 2.5 mm btu/hr	CO2 Carbon Dioxide	232 lbs/150 kWh	
CO2 Carbon Dioxide	2.5 mm btu/hrEstimates	2.5 mm btu/hr Estimates from EPA AP-42	4.0 mm btu/hr Estimates from EPA AP-42
CO Carbon Monoxide	0.898 CO tons/yr	1.752 CO tons/yr	2.803 CO tons/yr
	0.082 lbs/mm btuhr	0.160 lbs/mm btuhr	0.160 lbs/mm btuhr
	0.205 lbs/hr	0.400 lbs/hr	0.640 lbs/hr
NOx Nitrogen oxides	1.095 NOx tons/yr	0.438 NOx tons/yr	0.701 NOx tons/yr
	0.100 lbs/mm btu	0.040 lbs/mm btu	0.040 lbs/mm btu
	0.255 lbs/hr	0.100 lbs/hr	0.160 lbs/hr
VOC Estimate	0.000 THC tons/yr	0.066 THC tons/yr	0.105 THC tons/yr
	0.000 lbs/mm btu	0.006 lbs/mm btu	0.006 lbs/mm btu
	0.000 lbs/hr	0.015 lbs/hr	0.024 lbs/hr
PM Particulate matter -	0.055 PM tons/yr	0.077 PM tons/yr	0.123 PM tons/yr
	0.005 lbs/mm btu	0.007 lbs/mm btu	0.007 lbs/mm btu
	0.013 lbs/hr	0.018 lbs/hr	0.028 lbs/hr

Pyro Gas Glycol Heater Estimate					
max 4 mmbtu/hr normal 2.5 mm btu/hr	Gas Composition				
CO2 Carbon Dioxide	H2				
	Pyrolysis Gas burning 2.5 mm btu/hr	Pyrolysis Gas Standard Burners	Pyrolysis Low NOX Burners		
	ARTI data used for the Pyrolysis Burners	2.5 mm btu/hr Estimates from EPA AP-42	2.5 mm btu/hr Estimates from EPA AP-42		
CO Carbon Monoxide	0.526 CO tons/yr	1.752 CO tons/yr	1.752 CO tons/yr		
	0.048 lbs/mm btu	0.160 lbs/mm btuhr	0.160 lbs/mm btuhr		
	0.120 lbs/hr	0.400 lbs/hr	0.400 lbs/hr		
				Pyrolysis Gas Composition	(est)
NOx Nitrogen oxides	0.526 NOx tons/yr	0.438 NOx tons/yr	0.329 NOx tons/yr	H2	34
	0.048 lbs/mm btu	0.040 lbs/mm btu	0.030 lbs/mm btu	CO	40
	0.120 lbs/hr	0.100 lbs/hr	0.075 lbs/hr	CH4	13.3
				C2H6	5.7
VOC Estimate	0.000 THC tons/yr	0.066 THC tons/yr	0.066 THC tons/yr	CO2	7
	0.000 lbs/mm btu	0.006 lbs/mm btu	0.006 lbs/mm btu		100
	0.000 lbs/hr	0.015 lbs/hr	0.015 lbs/hr		
PM Particulate matter -	0.022 PM tons/yr	0.077 PM tons/yr	0.077 PM tons/yr		
	0.002 lbs/mm btu	0.007 lbs/mm btu	0.007 lbs/mm btu		
	0.005 lbs/hr	0.018 lbs/hr	0.018 lbs/hr		

Glycol heater emissions.docx

Truck loading times.docx

Trial Unit Operation will be 1/25 th of the Pyrolysys 25 ton/day skid

TRE Propane Burners TRE						
max 200,000 btu/hr normal 150	Gas Composition					
CO2 Carbon Dioxide	H2					
	Propane Gas Standard Burners		Propane Low NOX Burners			
	200k btu/hr Estimates from EPA AP-42		200k btu/hr Estimates from EPA AP-42			
CO Carbon Monoxide	0.140	CO tons/yr	0.140	CO tons/yr		
	0.160	lbs/mm btuhr	0.160	lbs/mm btuhr		
	0.032	lbs/hr	0.032	lbs/hr		
					Propane Gas Composition (est)	
NOx Nitrogen oxides	0.035	NOx tons/yr	0.026	NOx tons/yr	H2	34
	0.040	lbs/mm btu	0.030	lbs/mm btu	CO	40
	0.008	lbs/hr	0.006	lbs/hr	CH4	13.3
					C2H6	5.7
VOC Estimate	0.005	THC tons/yr	0.005	THC tons/yr	CO2	7
	0.006	lbs/mm btu	0.006	lbs/mm btu		100
	0.001	lbs/hr	0.001	lbs/hr		
PM Particulate matter -	0.006	PM tons/yr	0.006	PM tons/yr		
	0.007	lbs/mm btu	0.007	lbs/mm btu		
	0.001	lbs/hr	0.001	lbs/hr		

TRE burner emissions on Propane.docx

TRE Flare

Basis: TRE unit produces Pyrolysis Gas which is flared in the TRE flare

TRE Pyro Gas production rate is estimated to be 1/50th of the total 2 skid Pyro Gas production

TRE Pyro Gas = 18.798 lbs/hr 125 lb/lbmole

Here are the actual emissions expected from the combustion of the pyro gases:

NOx emissions = <30 PPM corrected to 3.0% oxygen

CO emissions = < 50 PPM corrected to 3.0 % oxygen

SOx emissions = < 15 PPM corrected to 3.0% excess oxygen

PE Emission = < .0005 lbs./MMBTU

Glycol heater emissions burning Pyro gas 2.5mmbtu-

TRE Pyro Gas Flare		
max 100,000 btu/hr normal 60,000 btu/hr		
In service 1000 hrs/yr		
	Pyrolysis Gas Flare Burn 100k btu/hr	
	Estimates from EPA AP-42	
CO Carbon Monoxide	0.008	CO tons/yr
	0.160	lbs/mm btuhr
	0.016	lbs/hr
NOx Nitrogen oxides	0.002	NOx tons/yr
	0.040	lbs/mm btu
	0.004	lbs/hr
VOC Estimate	0.000	THC tons/yr
	0.006	lbs/mm btu
	0.001	lbs/hr
PM Particulate matter	0.000	PM tons/yr
	0.007	lbs/mm btu
	0.001	lbs/hr

Basis -TRE Pyro Gas Composition and Flare CO2 Emissions									
Pyro Gas	btu/scf	476.594							
Al Pyro gas composition									
	H2	20-40%	34		325	btu/scf	110.5		
assumed fc	CO	35-40%	40		325	btu/scf	130		
	C1 / C2	19%	19	1011/1783		btu/scf	134.463		
	CO2	5-15%	7		0%		101.631		
	N2		0		0				
			100						
			Estimated				476.594	btu/scf	
							59574.25	btu/hr	
CO2 Emissions	9.6lbs/	4.8	tons/yr CO2 emissions						
								lb/lbmole	lbs
		125	scfh				H2	2	0.68
		0.329815	lbmoles/hr				CO	28	11.2
	C from CO	0.131926	lbmoles/hr				CH4	16	2.128
	C from C1	0.043865		70% CH4			C2H6	30	1.71
	C from C2	0.018799		30% C2H6			CO2	44	3.08
	CO2 from g	0.023087					Lbs/hr		18.798
	Total C	0.217678	lbmoles/hr						
	Mole wt CC	44	lb/lbmole						
	CO2	9.577836	lb/hr CO2 Trial Unit						
	Annual CO	**4.8**	**tons/yr**						

D2.1 45CSR R-6 — Control of Air Pollution from Combustion of Refuse

This section requires particulate matter emission for new source to be limited as provided to emission standards for incinerators and incineration (Refuse-Combustion) using formula provided by:

Emissions(lb/hr) = F x Incinerator capacity (tons/hr)

Were factor F, as per Table 1: Determining maximum allowable particulate emission.
Incinerator Capacity Factor-'F'

a) less than 15000 lb/hr 5.43
b) 15000 lb/hr or greater 2.72

Emissions(lb/hr) = 5.43 x 0.825 tons/hr = 4.479 4.50lb/hr

Are we "combusting refuse?" Or is this just the relevant regulation?

Need guidance from Bowles – what emissions to report for "incineration?"

Pyrolysis Capacity 25 tonnes/day/unit

2 units X 25 tonnes/day X 2200lbs/tonne X 1 day/24hr= 4583 lbs/hr 2.29 tons/hr

Factor F select a) less than 15000 lb/hr 5.43

Emissions lb/hr = 5.43 X 25 X 2 X 2200lbs/tonne / 2000 lbs/ton = tons/hr 12.44 lbs/hr emissions

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **2025 MODEL YEAR** **CERTIFICATE OF CONFORMITY** **WITH THE CLEAN AIR ACT**	**OFFICE OF TRANSPORTATION AND AIR QUALITY** **ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Generac Power Systems, Inc. (U.S. Manufacturer or Importer) **Certificate Number: SGNXB08.92O3-015**	**Effective Date:** **11/27/2024** **Expiration Date:** **12/31/2025**	**Byron J. Bunker, Division Director** **Compliance Division**	**Issue Date:** **11/27/2024** **Revision Date:** **N/A**

Manufacturer: Generac Power Systems, Inc.
Engine Family: SGNXB08.92O3
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
Emission Standards :
Part 60 Subpart JJJJ Table 1
NOx (g/Hp-hr) : 2.0
CO (g/Hp-hr) : 4.0
VOC (g/Hp-hr) : 1.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

GENERAC
INDUSTRIAL ENERGY

STATEMENT OF EXHAUST EMISSIONS
2025 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

Model	Engine (L)	EPA Engine Family	Fuel	Catalyst Required	EPA Certification #	Engine Emissions Designation	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
							THC	NMHC	NOx	CO			
SG035, 40, 45, 50NA	4.4	SGNXB04.4MDI	NG	NO	SGNXB04.4MDI-020	A04.5SPN057A0	0.63	0.09	4.42	34.6	1800	75	25.9
SG035, 40, 45, 50NA	4.4	SGNXB04.4MDI	LPV		SGNXB04.4MDI-020	A04.5SPV057A0	0.83	N/A	5.20	63.4	1800	76	29.5
SG050T, 60, 70, 80	4.4	SGNXB04.4MDI	NG		SGNXB04.4MDI-020	A04.5SPN096A0	N/A	0.12	3.32	42.3	1800	129	45.2
SG050T, 60, 70, 80	4.4	SGNXB04.4MDI	LPV		SGNXB04.4MDI-020	A04.5SPV096A0	0.47	N/A	3.23	58.8	1800	129	49.0
SG080	8.9	SGNXB08.9MDA	NG		SGNXB08.9MDA-019	A08.9GSN093A0	0.59	N/A	1.06	91.9	1800	125	62.4
SG080	8.9	SGNXB08.9MDA	LPV		SGNXB08.9MDA-019	A08.9GSV095A0	0.70	N/A	1.52	123	1800	128	61.5
SG080	8.9	SGNXB08.9MDA	LPL		SGNXB08.9MDA-019	A08.9MSL095A0	0.74	N/A	1.31	126	1800	128	60.2
SG080, 100	8.9	SGNXB08.92O1	NG	YES	SGNXB08.92O1-005	E08.9MDL113A1	0.17	0.00	0.01	1.01	1800	151	51.9
SG080, 100 (LPF)	8.9	SGNXB08.92O1	NG		SGNXB08.92O1-005	E08.9MDV113A0	0.11	0.00	0.12	0.03	1800	152	46.9
SG080, 100	8.9	SGNXB08.92O2	LPV		SGNXB08.92O2-001	F08.9MSV106A0	0.01	N/A	0.21	0.22	1800	142	54.8
SG080, 100	8.9	SGNXB08.92O2	LPL		SGNXB08.92O2-001	F08.9MSL106A0	0.03	0.01	0.00	0.36	1800	155	55.3
SG/MG130, 150	8.9	SGNXB08.92O3	NG		SGNXB08.92O3-015	E08.9MSN170A0	0.14	0.00	0.10	0.74	1800	228	84.8
SG/MG130, 150	8.9	SGNXB08.92O4	LPV		SGNXB08.92O4-016	F08.9MSV169A1	0.06	0.00	0.09	0.19	1800	230	85.4
SG/MG150, 200	14.2	SGNXB14.22C1	NG		SGNXB14.22C1-017	E14.2MSN227A3	0.24	0.01	0.12	0.21	1800	304	101
SG/MG230, 250	14.2	SGNXB14.22C1	NG		SGNXB14.22C1-017	E14.2MSN279A3	0.14	0.00	0.35	0.41	1800	374	142
SG/MG275, 300	14.2	SGNXB14.22C1	NG		SGNXB14.22C1-017	E14.2MSN343A3	0.03	0.00	0.04	0.31	1800	460	140
SG/MG350, 400	21.9	SGNXB21.92C1	NG		SGNXB21.92C1-009	E21.9MSN474A4	0.07	0.00	0.26	0.21	1800	651	176
SG/MG350, 400 (LPF)	21.9	SGNXB21.92C1	NG		SGNXB21.92C1-009	E21.9MSN474A5	0.30	0.00	0.06	0.12	1800	621	214
SG/MG350, 400, 450	21.9	SGNXB21.92C3	NG		SGNXB21.92C3-010	E21.9MSN0502A4	0.15	0.00	0.08	0.32	1800	673	223
SG/MG350, 400, 450 (LPF)	21.9	SGNXB21.92C3	NG		SGNXB21.92C3-010	E21.9MSN0502A5	0.19	0.00	0.05	0.17	1800	673	224
SG/MG500	25.8	SGNXB25.82C1	NG		SGNXB25.82C1-008	E25.8MSN580A4	0.16	0.00	0.03	0.59	1800	777	280
SG/MG500 (LPF)	25.8	SGNXB25.82C1	NG		SGNXB25.82C1-008	E25.8MSN580A5	0.19	0.00	0.06	0.57	1800	777	280
SG/MG625	33.9	SGNXB33.92C1	NG		SGNXB33.92C1-035	E33.9MSN677A0	0.13	0.00	0.01	0.21	1800	909	325
SG/MG750	33.9	SGNXB33.92C1	NG		SGNXB33.92C1-035	E33.9MSN803A0	0.18	0.00	0.15	0.91	1800	1077	417
SG/MG1000	49.0	SGNXB49.02C1	NG		SGNXB49.02C1-003	E49.0ASN1100A0	0.12	0.00	0.03	0.64	1800	1475	427

NG/LP: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

Engine BHP is taken from Engine Emissions Certificate Results
LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Option Low Pressure Fuel System

N/A: Not Applicable
Refer to Page 2 for Definitions and Advisory Notes.

Part No. A006723255
Rev. B 3/14/25

GENERAC
INDUSTRIAL ENERGY

STATEMENT OF EXHAUST EMISSIONS
2025 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

2025 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

Part No. A0006723255
Rev. B 3/14/25

SG150 | 9.0 L | 150 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC INDUSTRIAL ENERGY

Standby Power Rating

150 kW, 188 kVA, 60 Hz

USA ENGINEERED & BUILT*

*Assembled in the USA using domestic and foreign parts

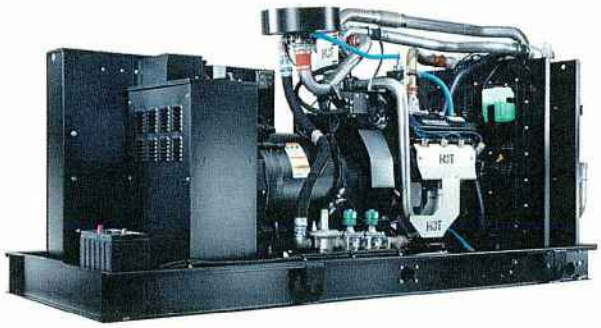


Image used for illustration purposes only

Codes and Standards

Generac products are designed to the following standards:.

UL2200, UL508, UL489

CSA C22.2

BS5514 and DIN 6271

SAE J1349

NFPA 37, 70, 99, 110

NEC700, 701, 702, 708

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

Generac provides superior quality by designing and manufacturing most of its generator components, such as alternators, enclosures, control systems and communications software. Generac also makes its own spark-ignited engines, and you'll find them on every Generac gaseous-fueled generator. We engineer and manufacture them from the block up — all at our facilities throughout Wisconsin. Applying natural gas and LP-fueled engines to generators requires advanced engineering expertise for reliability, durability and necessary performance. By designing specifically for these dry, hotter-burning fuels, the engines last longer and require less maintenance. Building our own engines also means we control every step of the supply chain and delivery process, so you benefit from single-source responsibility.

Plus, Generac Industrial Power's distribution network provides all parts and service so you don't have to deal with third-party suppliers. It all leads to a positive owner experience and higher confidence level. Generac spark-ignited engines give you more options in commercial and industrial generator applications as well as extended run time from utility-supplied natural gas.

SG150 | 9.0 L | 150 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC INDUSTRIAL ENERGY

STANDARD FEATURES

ENGINE SYSTEM
- Oil Drain Extension
- Air Cleaner
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Critical Silencer/Catalyst

FUEL SYSTEM
- NPT Fuel Connection on Frame
- Primary and Secondary Fuel Shutoff

COOLING SYSTEM
- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

ELECTRICAL SYSTEM
- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM
- UL2200 GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Permanent Magnet Excitation
- Sealed Bearings
- Amortisseur Winding
- Full Load Capacity Alternator

GENERATOR SET
- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby Rated Units)
- Silencer Mounted in the Discharge Hood (Enclosed Only)

ENCLOSURE (If Selected)
- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuation Enclosures)
- Gasketed Doors
- Stamped Air-Intake Louvers
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONTROL SYSTEM

Digital H Control Panel- Dual 4x20 Display

Program Functions
- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- 3 Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)
- Auto Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

Full System Status Display
- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Speed
- Battery Voltage
- Frequency

Alarms and Warnings
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)

PARALLELING CONTROLS
- Auto-Synchronization Process
- Isochronous Load Sharing
- Reverse Power Protection
- Maximum Power Protection
- Electrically Operated, Mechanically Held Paralleling Switch
- Sync Check System
- Independent On-Board Paralleling
- Optional Programmable Logic Full Auto Back-Up Controls (PLS)
- Shunt Trip and Auxiliary Contact

CONFIGURABLE OPTIONS

ENGINE SYSTEM
- Engine Block Heater
- Oil Heater
- Air Filter Restriction Indicator
- Radiator Stone Guard (Open Set Only)
- Baseframe Cover/Rodent Guard
- Level 1 Fan and Belt Guards (Enclosed Units Only)
- Shipped Loose Critical Silencer (Open Set Only)

FUEL SYSTEM
- NPT Flexible Fuel Line
- Dual Fuel NG/LPV
- Dual Fuel NG/LPL

ELECTRICAL SYSTEM
- 10A UL Battery Charger
- Battery Warmer

ALTERNATOR SYSTEM
- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Coating

CIRCUIT BREAKER OPTIONS
- Main Line Circuit Breaker
- 2nd main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

GENERATOR SET
- Demand Response Rating
- Extended Factory Testing (3 Phase Only)
- IBC Seismic Certification
- 8 Position Load Center

ENCLOSURE
- Weather Protected Enclosure
- Level 1 Sound Attenuated
- Level 2 Sound Attenuated
- Level 2 Sound Attenuated with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure
- AC/DC Enclosure Lighting Kit
- Enclosure Heater
- Pad Vibration Isolation
- Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- Door Open Alarm Switch

CONTROL SYSTEM
- NFPA 110 Compliant Level 1 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Oil Temperature Indication and Alarm
- Remote E-Stop (Break Glass-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- 10A Engine Run Relay
- Ground Fault Annunciator
- 100 dB Alarm Horn
- 120V GFCI and 240V Outlets
- Damper Alarm Contacts (Motorized Dampers Only)
- Auxiliary Circuit Breaker Contacts to Controller

WARRANTY (Standby Gensets Only)
- 2 Year Extended Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

ENGINE SYSTEM
- Coolant Heater Ball Valves
- Fluid Containment Pan

ATLERNATOR SYSTEM
- 3rd Breaker System

CONTROL SYSTEM
- Battery Disconnect Switch

GENERATOR SET
- Special Testing
- Battery Box

SG150 | 9.0 L | 150 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC INDUSTRIAL ENERGY

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	8
Type	V
Displacement - in³ (L)	543 (8.9)
Bore - in (mm)	4.49 (114.3)
Stroke - in (mm)	4.25 (108)
Compression Ratio	G18 - 10.5:1 / G26 - 9.1:1 *
Intake Air Method	Turbocharged/Aftercooled
Number of Main Bearings	5
Connecting Rods	Forged Steel
Cylinder Head	Cast Iron
Cylinder Liners	No
Ignition	High Energy
Piston Type	Aluminum Alloy
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic Roller
Intake Valve Material	Steel Alloy
Exhaust Valve Material	Stainless Steel
Hardened Valve Seats	Yes

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear Driven
Oil Filter Type	Full-Flow Spin-On Cartridge
Crankcase Capacity: qt (L)	G18 - 8.5 (8.0) / G26 - 9.5 (10.0) *

Cooling System

Cooling System Type	Pressurized Closed
Fan Type	Pusher
Fan Speed (RPM)	G18 - 2,330 / G26 - 2,386 *
Fan Diameter - in (mm)	22 (559)

Fuel System

Fuel Type	Natural Gas, Propane Vapor/ Liquid
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure - in H_2O	7 - 11 (1.7 - 2.7)
Optional Operating Fuel Pressure (LPL) — psi (KPa)	30 - 312 (206 - 2,151)

*When designing the external fuel system, assume a 20% safety factor to the upper and lower limit of the specified fuel pressure range to account for site variation and measurement at the generator test port. Refer to Generac 10000046207, latest rev, for proper gas supply guidelines (Contact Factory for Details).

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

* G18 refers to all engines manufactured before August 3rd, 2018. G26 refers to all engines manufactured after August 3rd, 2018.

ALTERNATOR SPECIFICATIONS

Standard Model	K0150124Y26
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5%
Telephone Interference Factor (TIF)	<50
Standard Excitation	Permanent Magnet
Bearings	Single Sealed Ball
Coupling	Direct Drive
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

SG150 | 9.0 L | 150 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC INDUSTRIAL ENERGY

OPERATING DATA

POWER RATINGS

	G18, G26 - Natural Gas *		G18, G26 - Propane/Dual Fuel *	
Single-Phase 120/240 VAC @ 1.0pf	144 kW/144 kVA	Amps: 600	134 kW/134 KVA	Amps: 558
Three-Phase 120/208 VAC @0.8pf	150 kW/188 kVA	Amps: 521	140 kW/175 kVA	Amps: 486
Three-Phase 120/240 VAC @0.8pf	150 kW/188 kVA	Amps: 452	140 kW/175 kVA	Amps: 422
Three-Phase 277/480 VAC @0.8pf	150 kW/188 kVA	Amps: 226	140 kW/175 kVA	Amps: 211
Three-Phase 346/600 VAC @0.8pf	150 kW/188 kVA	Amps: 181	140 kW/175 kVA	Amps: 169

MOTOR STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip

277/480 VAC	30%	208/240 VAC	30%
K0150124Y26	327	K0150124Y26	250
K0200124Y21	478	K0200124Y21	361

FUEL CONSUMPTION RATES*

Natural Gas – scfh (m^3/hr)		Propane Vapor – scfh (m^3/hr)		Propane Liquid – gal/hr (Lph)	
Percent Load	Standby	Percent Load	Standby	Percent Load	Standby
25%	668 (18.9)	25%	280 (7.9)	25%	6.7 (25.4)
50%	1,127 (31.9)	50%	430 (12.2)	50%	11.4 (43.2)
75%	1,583 (44.8)	75%	573 (16.2)	75%	15.7 (59.4)
100%	2,042 (57.8)	100%	720 (20.4)	100%	20.0 (75.7)

*1.5X maximum site rated fuel consumption should be used for gas supply design practices. Refer to Generac 10000046207, latest rev., for more information or contact factory for details.

COOLING

		Standby
Air Flow (Fan Air Flow Across Radiator)	cfm (m^3/min)	5,598 (158.5)
Coolant Flow	gpm (Lpm)	27.5 (104)
Coolant System Capacity	gal (L)	6.3 (24.0)
Maximum Operating Air Temperature on Radiator	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)	See Bulletin 0199270SSD	
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power cfm — (m^3/min)	343 (9.7)

ENGINE

		Standby
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	229
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	185 (1,277)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m^3/min)	1,206 (34.1)
Maximum Exhaust Backpressure	inHG (kPa)	0.75 (2.54)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	1,440 (782)

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with BS5514 and DIN6271 standards.

Standby - See Bulletin 0187500SSB

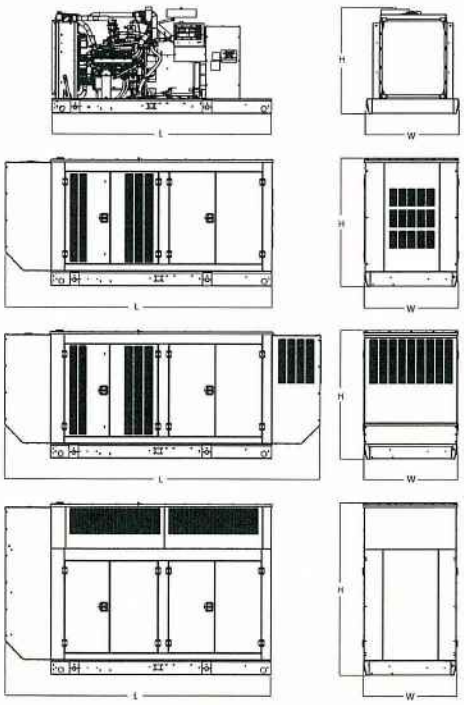
SG150 | 9.0 L | 150 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC INDUSTRIAL ENERGY

DIMENSIONS AND WEIGHTS*



OPEN SET (Includes Exhaust Flex)

L x W x H - in (mm)	116.5 (2,959) x 49.7 (1,262) x 55.6 (1,412)
Weight - lbs	2,946 (1,336)

WEATHER PROTECTED ENCLOSURE

L x W x H - in (mm)	143.0 (3,631) x 50.4 (1,280) x 68.2 (1,732
Weight - lbs	Steel: 3,843 (1,743) Aluminum: 3,384 (1,535)

LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	143.0 (3,632) x 50.4 (1,280) x 91.7 (2,329)
Weight - lbs	Steel: 4,321 (1,960) Aluminum: 3,592 (1,629)

LEVEL 2 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	144.53 (3,671) x 40.46 (1,027.8) x 80.88 (2,054.3)
Weight - lbs	Steel: 3,789 (1,719) Aluminum: 3,207 (1,455)

*All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

SPEC SHEET

Generac Power Systems, Inc. | S45 W29290 HWY. 59 | Waukesha, WI 53189 | generac.com

Part No. 0K6450
Rev. M 04/01/2025

Determining the precise per-hour emissions of carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter (PM) from a 150 kW natural gas generator at full load without catalytic control is complex, and can vary based on several factors, including:

- Engine Design and Technology: Different engine manufacturers and models will have varying combustion efficiencies and emissions characteristics.
- Operating Conditions: Parameters like air-fuel ratio and engine load influence emissions output.
- Maintenance: Well-maintained engines generally produce lower emissions.
- Fuel Quality: Variations in natural gas composition can impact combustion and emissions.

Despite these variables, available data and emissions factors offer some insights. For example:

- A Cummins C150 N6 natural gas generator, rated at 150 kW, has the following emissions when operating at full load without catalytic control:
    - CO: 412 ppmvd (parts per million by volume, dry basis) or 1.74 grams per HP-hour.
    - NOx: 360 ppmvd or 1.77 grams per HP-hour.
- Other studies have found that CO emissions factors tend to decrease with increasing engine load, while NOx emissions factors increase up to mid-loads and decrease slightly at high loads.
- Natural gas combustion generally produces low filterable particulate matter (PM) emissions because it is a gaseous fuel. Studies estimate these particles are typically less than 1 micrometer in size and have filterable and condensable fractions. PM emissions factors are also influenced by engine load and age, with newer engines tending to have lower PM emissions.

Below is an order-of-magnitude estimate of uncontrolled CO, NO_x, VOC and particulate (PM_{10}/$PM_{2.5}$) emissions for a small industrial heater firing propane at 0.2 MMBtu/hr. All factors are taken from EPA AP-42, Section 1.4 (Gas- and Oil-Fired Boilers and Heaters) for a conventional (non-low-NO_x) burner.

Step 1 – AP-42 Uncontrolled Emission Factors (lb pollutant per MMBtu fuel input)

- CO: 0.10 – 0.23 (typical 0.16)
- NO_x: 0.03 – 0.11 (typical 0.04)
- VOC: 0.004 – 0.010 (typical 0.006)
- PM_{10}: 0.004 – 0.010 (typical 0.007)

($PM_{2.5} \approx PM_{10}$ for propane combustion)

Step 2 – Multiply by 0.2 MMBtu/hr

Pollutant	EF Range (lb/MMBtu)	Emission Rate Range (lb/hr)	Typical EF (lb/MMBtu)	Typical Rate (lb/hr)
CO	0.10 – 0.23	0.02 – 0.046	0.16	0.032
NO_x (as NO_2)	0.03 – 0.11	0.006 – 0.022	0.04	0.008
VOC	0.004 – 0.010	0.0008 – 0.0020	0.006	0.0012
PM_{10}	0.004 – 0.010	0.0008 – 0.0020	0.007	0.0014

Notes

1. These factors assume a standard (uncontrolled) propane burner. If you have a low-NO_x burner, the NO_x EF may drop into the 0.01–0.05 lb/MMBtu range (≈ 0.002–0.010 lb/hr at 0.2 MMBtu/hr).
2. $PM_{2.5}$ emissions from propane combustion are essentially the same as PM_{10}.

Attachment O

Monitoring, Recordkeeping, Reporting and Testing Plans

Pyrolysis Unit 1 and 2 - Natural Gas or Pyrolysis Gas Fired Low NOx Burners

The West Virginia Department of Environmental Protection (WVDEP) has a comprehensive set of regulations for air pollution sources, including plants operating with natural gas fired burners.

Applicable Regulations: Federal and State regulations like Title V, NSPS, NESHAP, and specific WVDEP rules such as 45CSR13 for minor sources, 45CSR30 for major sources, and 45CSR10 for sulfur oxides.

1. Emissions Monitoring

Stack Testing/Performance Tests: On initial startup and annually, emissions testing will be completed to demonstrate compliance with emission limits for CO, NOx, and VOC.

Fuel Analysis: Operations will monitor pyrolysis gas for H2S, Cl, and CO content daily using gas detection tubes or other methods. Operations will log these readings in operating logs and note trends. Annually the data will be summarized and included in the report to site management.

3. Recordkeeping

Emissions Records: Clean Seas will maintain records of testing daily and annual testing data, including emissions data, stack test results, and calculations based on emission factors.

Operating Parameters: Records of daily operational parameters and trends, such as fuel usage, operating hours, and equipment settings will be maintained.

Maintenance Records: Records of maintenance and repairs performed on the burners and associated control equipment will be kept.

Compliance Records: Documentation of plant performance with respect to permitted limits and applicable regulations will be maintained at the plant site offices.

4. Reporting

Annual Emissions Inventory: A record of the annual emissions inventory will be reported to the WVDEP, detailing the monitoring of regulated pollutants emitted by the facility. This will

include Malfunction and Upset Reports that resulted in emissions exceeding permit limits. Compliance Reports: Clean Seas will submit periodic compliance reports as specified in the permit discussing how the facility performed with respect to permitted limits.

Flare 40 CFR 63.108

1. Monitoring

Pilot Flame Monitoring: Operations will continuously monitor of the presence of the pilot flame(s) using a device like a thermocouple or infrared sensor which records data to the operations control system.

Visible Emissions: Clean Seas Operations will continuously monitor the flare for visible emissions exceeding 5 minutes in any two-hour period when material is routed to the flare. Operators in the control room will also monitor the flare with a camera.

2. Recordkeeping

Records documenting pilot flame status, visible emissions observations, flow rates and operating parameters, flare vent gas upset sources, and periods when operating values are outside limits or when monitoring was not performed correctly will be maintained in operating logs.

3. Reporting

An annual or more frequent if required Monitoring Report will be filed reporting excursions, missing readings, exceedances. Confirmed releases will be reported within 24 hours to the relevant agencies.

Tanks

The portable storage tanks (Baker Style) will be monitored by Clean Seas daily for leaks, overfilling and other upsets by the operators. The daily monitoring will include visual inspections, inventory control or other activities. Monitoring will inform the recordkeeping and reporting for the site's conformance with permitted activities.

The pyrolysis plants are designed to produce low vapor pressure pyrolysis oil. Clean Seas will use nitrogen blanketing and vent tanks to the flare for safe combustion of any vapors. Operations controls will continuously monitor purging of the tanks with nitrogen and record vapor flows to the flare.

Recordkeeping

The facility will keep records of operation, maintenance, corrosion prevention, inspections (routine and periodic) and initial tightness testing. The site will maintain records of releases, containment, and follow-up actions.

Reporting

Release Reporting: Clean Seas will report releases above threshold quantities to the WVDEP appropriate authorities. Confirmed releases will be reported within guidelines to WVDEP authorities. Clean Seas will maintain Spill Prevention and Response Plans.

Certified Inspections: Required for ASTs.

Corrective Action: For confirmed releases, Clean Seas will follow AST rules, including immediate containment and hazard mitigation.

Truck Loading Rack

Requirements are primarily governed by West Virginia Legislative Rule 45CSR21, which addresses the control of VOC emissions.

1. Emissions control and testing

The Clean Seas truck loading will be designed to contain vapors preventing any leakage to atmosphere. The loading design will control VOC emissions through the application of reasonably available control technology (RACT). Testing of the loading system will be completed before each truck loading to verify that the hoses, piping and equipment are properly aligned and in working condition. Initial and period testing will be used to demonstrate compliance with these emission limits.

2. Monitoring

Before loading or unloading each truck, operations and truck drivers will check for system integrity upon initial connection and at completion of the product loading. Control devices including VOC control devices (e.g., pressure, temperature, or flow rate) will be in place to maintain system integrity. Collection pans, curbing and other equipment will be used to catch any material when hoses or piping are disassembled.

3. Recordkeeping

Maintain records of all testing and calculations performed to demonstrate compliance.

Clean Seas will keep records of maintenance and inspection activities related to the loading rack and control equipment. The facility will log operational data, including any deviations from normal operating conditions or malfunction events.

4. Reporting

Clean Seas will maintain records of shipments, incidents, oil quality/properties and inventories. Deviations from permit requirements or malfunctions resulting in excess emissions will be logged and reported to the WVDEP, as specified in the facility's permit.

An emission Inventory will be prepared and submitted annually, detailing the amount of air pollutants emitted from the loading rack and other sources at the plant.

Emergency Power Generator 45CSR13

The site will install an emergency backup generator to enable safe shutdown of the plant for loss of electrical power supply to the facility. Emissions from this generator will be limited by using natural gas as a fuel and a catalytic converter on the exhaust.

Monitoring

The site will record the annual hours of operation including non-emergency usage such as maintenance checks and testing. The site will test run the generator once per week for approximately and hour.

Natural Gas Fuel Usage: Record the quantity of natural gas consumed by the generator.

Emission Limits: The manufacturer has performed testing on the generator and has reported the emissions of nitrogen oxides (NOx), carbon monoxide (CO), CO2, PE, sulfur dioxide (SO2), and volatile organic compounds (VOCs) based on natural gas fuel.

Recordkeeping

Operating Logs: Clean Seas will maintain records of the dates, times, and duration of all emergency and non-emergency operations.

Fuel Purchase Records: The site will keep records of natural gas purchases to document fuel consumption.

Maintenance Records: Document all maintenance and repairs performed on the generator.

Manufacturer Specifications: Keep records of the generator's manufacturer's specifications and compliance demonstrations

Reporting

Annual Emission Reports: Submit reports detailing the generator's emissions of regulated air pollutants, often using the DEP's emissions inventory system or required forms.

Compliance Certifications and Deviation Reports: Submit periodic certifications of compliance with the permit conditions. Report any deviations from permit conditions or regulations, such as exceeding operational hour limits or emission limits.

Attachment P

Public Notice

Class 1 Legal Advertisement

45 CSR 13.8.3 and 45 CSR 13.8.5

Example of Legal Advertisement for Details

Affidavit of Publication on Attachment P

Clean-Seas West Virginia, Inc.

W.V. Plant – Legal

Plant Location:

2700 E Dupont Ave

Belle WV 25015

Reference Coordinates:

- UTM – Easting – 440427.769
- UTM – Nothing – 1822380.411
- UTM Zone – 17n
- Longitude: 32.2081876
- Latitude: -81.5081475

Total Building Area: 62,100 sq ft

Plant from seal level EL 627.699 – 628.177 feet above sea level

Plant floor EL – 628 ± .5 ft

Applicant: Clean-Seas West Virginia, Inc.

Type of Permit: Minor Source – "Construction Permit"

Operations: Plastics Pyrolysis Plant

Startup Date: October 15, 2025

Type of Pollutant: Criteria Pollutant – Each Criteria Pollutant allowance by EPA and WV DAQ is 100 tons per year – See Emissions Table 9.4

A) Criteria Pollutant	Tons Per Year (Rounded)
a. Particulate Matter	1
b. CO2 – Carbon Dioxide	3500
c. HCL	<.01
d. SO2 – Sulfur Dioxide	.02
e. NOX – Nitrogen Oxide	2
f. HAPS (Total)	6

B) Source and Contact – For more Information

Name: John Yonce, Clean-Seas

Address: 2700 E Dupont Ave, Ste 3B, Belle WV 25015

Tel: 304-220-2041

C) Written Comments:

1. All questions regarding this permit application should be directed to the DAQ at telephone number – (304)-926-0499 Ext 1250.

2. Written comments should be sent to:

The West Virginia Department of Environmental Protection

Division of Air Quality (DAQ)

601 57th Street SE

Charleston, WV 25304

From 30 days from the date of publication of this notice.