ENERVEST

7/15/2016

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304

Subject: EnerVest Operating Compression Project Servia station (G30-D151A) Class I Update.

Dear Sir or Madame,
Enervest is removing the Caterpillar engine currently at this facility and setting a Waukesha engine at this facility. Since this facility already has a permit I would like to update it for the new unit. Since the overall emissions of the new unit are lower than the previous unit I believe this should be a **Class I update**. If you have any additional questions please feel free to call me at 304-414-8171 or email me at mdearing@enervest.net.

Sincerely,

Michael Dearing
Air Emissions Supervisor

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G35-C GENERAL PERMIT REGISTRATION APPLICATION

PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION, RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS COMPRESSOR AND/OR DEHYDRATION FACILITIES

☐CONSTRUCTION
☐MODIFICATION
☐RELOCATION
☒CLASS I ADMINISTRATIVE UPDATE
☐CLASS II ADMINISTRATIVE UPDATE

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): EnerVest Operating LLC

Federal Employer ID No. (FEIN): 76-0460809

Applicant's Mailing Address: 300 Capitol Street, Suite 200

City: Charleston	State: WV	ZIP Code: 25301

Facility Name: Elk River Compressor Station

Operating Site Physical Address: Hallsburg road
If none available, list road, city or town and zip of facility.

City: Ivydale	Zip Code: 25113	County: Clay

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 38.524425
Longitude: -80.959924

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) G30-D151A

CERTIFICATION OF INFORMATION

This G35-C General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. **Any administratively incomplete or improperly signed or unsigned G35-C Registration Application will be returned to the applicant. Furthermore, if the G35-C forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Division of Air Quality immediately.

I hereby certify that all information contained in this G35-C General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: _____
Name and Title: SR Vice President and General Manager EVOC Phone: 304-343-5505 Fax:
Email: Blay@enervest.net Date: 7/12/16

If applicable:
Authorized Representative Signature: _____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Environmental Contact
Name and Title: Michael Dearing Air Emissions Supervisor Phone: 304-414-8171 Fax:
Email: mdearing@enervest.net Date: 7/7/16

OPERATING SITE INFORMATION

Briefly describe the proposed new operation and/or any change(s) to the facility: The facility will continue to operate as a natural gas compression facility the only change is we are installing a smaller engine.

Directions to the facility: Traveling north bound on interstate79 exit at exit 46 at end of ramp make a left onto Servia rd. Drive for appx .5 miles then turn left on to hallsburg rd travel for 0.1 miles then turn left onto a gravel road and proceed to facility.

ATTACHMENTS AND SUPPORTING DOCUMENTS

I have enclosed the following required documents:

Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22).

☐ Check attached to front of application.
☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address):
☒ I wish to pay by credit card. Contact for payment (incl. name and email address): MDearing@enervest.net

☒ $500 (Construction, Modification, and Relocation) ☐ $300 (Class II Administrative Update)
☒ $1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO [1]
☐ $2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2]

[1] Only one NSPS fee will apply.
[2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ.
NSPS and NESHAP fees apply to new construction or if the source is being modified.

☐ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G35-C Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☐ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment K	
☐ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment L	
☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment M	
☐ Tanker Truck Loading Data Sheet (if applicable) – Attachment N	
☐ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment O	
☒ Pneumatic Controllers Data Sheet – Attachment P	
☐ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment Q	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment R	
☒ Facility-wide Emission Summary Sheet(s) – Attachment S	
☐ Class I Legal Advertisement – Attachment T	
☐ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

All attachments must be identified by name, divided into sections, and submitted in order.

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means 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). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

Is there a facility owned by or associated with the natural gas industry located within one (1) mile of the proposed facility? Yes ☐ No ☐

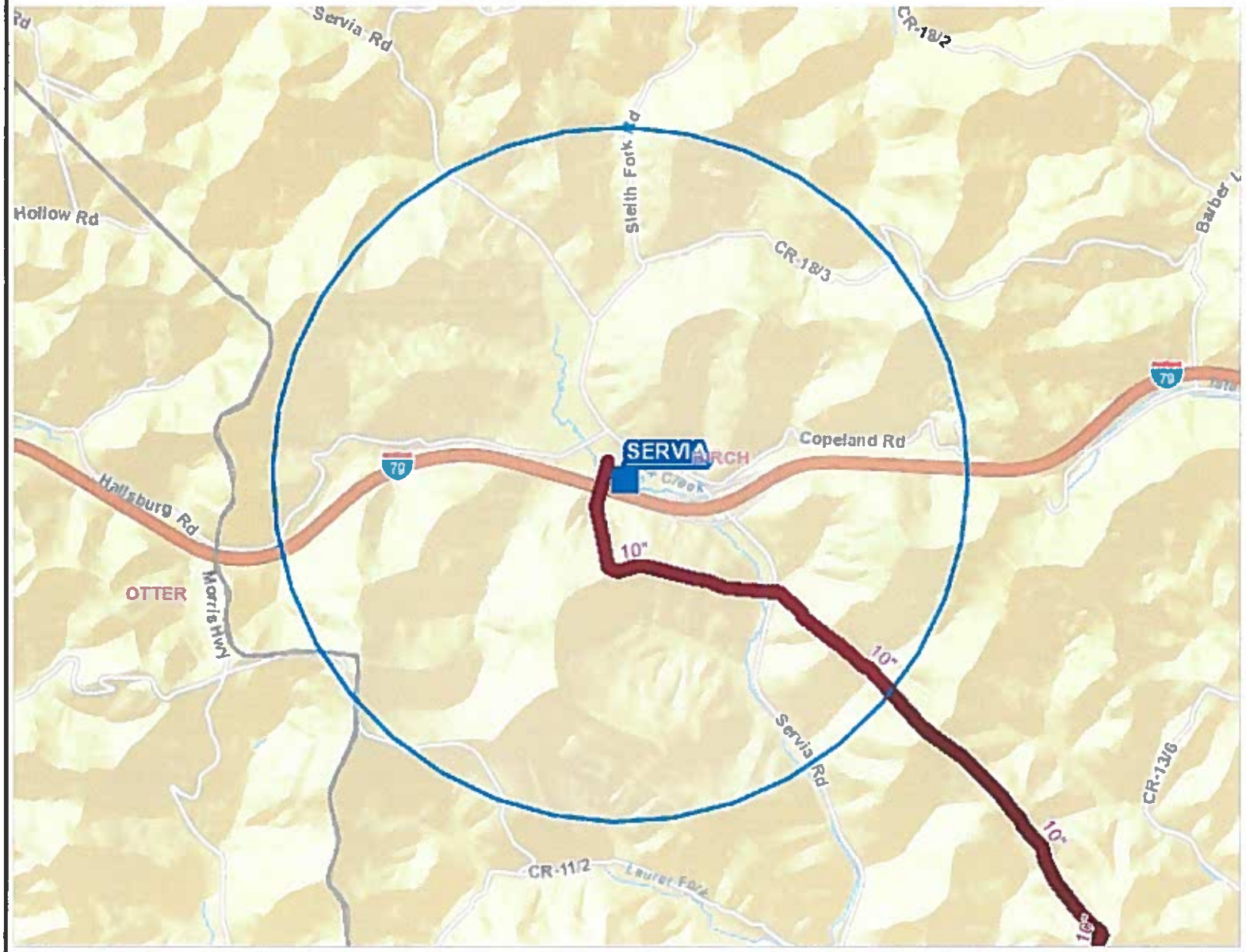
If Yes, please complete the questionnaire on the following page (Attachment A).

Please provide a source aggregation analysis for the proposed facility below:

The only facility within a one mile radius is the pipeline and without the compressor the pipeline will not function. Please see map on the following page.

EnerVest Operating, LLC

One mile Radis of Other O&G Facilities



Legend

- Widen Wells
- Pipeline
  - 1", 1.25", 1.5"
  - 2"
  - 3", 3.5"
  - 4", 4.5"
  - 5"
  - 6"
  - 8"
  - 10"
  - 12"
  - 16"
  - 20"
  - Unknown
- Compressor

5,803 0 2,902 5,803 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

1: 34,821

"The attached map/plat reflects only the approximate location of the depicted natural gas and/or oil facilities (including wells, property and property lines, lease and lease boundary lines, etc). EnerVest Operating, LLC does not warrant the accuracy or completeness of the depiction. Furthermore, this map/plat is the property of EnerVest Operating, LLC and may contain confidential and/or proprietary information. It may not be copied or otherwise made available to any other party without the prior written consent from EnerVest Operating, LLC. EnerVest Operating, LLC expressly disclaims responsibility for any action, actions, or omission by a third party on the basis of the information depicted on this map/plat."

EAST GIS
Bringing Out The Best

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Answer each question with a detailed explanation to determine contiguous or adjacent properties which are under a common control and any support facilities. This section must be completed in its entirety.

Provide a map of contiguous or adjacent facilities (production facilities, compressor stations, dehydration facilities, etc.) which are under common control and those facilities that are not under common control but are support facilities. Please indicate the SIC code, permit number (if applicable), and the distance between facilities in question on the map.

Are the facilities owned by the same parent company or a subsidiary of the parent company? Provide the owners identity and the percentage of ownership of each facility. Enervest Operating owns the facility	Yes ☒	No ☐
Does an entity such as a corporation have decision making authority over the operation of a second entity through a contractual agreement or voting interest? Please explain.	Yes ☐	No ☒
Is there a contract for service relationship between the two (2) companies or, a support/dependency relationship that exists between the two (2) companies? Please explain.	Yes ☐	No ☒
Do the facilities share common workforces, plant managers, security forces, corporate executive officers or board executives?	Yes ☒	No ☐
Will managers or other workers frequently shuttle back and forth to be involved actively at both facilities?	Yes ☒	No ☐
Do the facilities share common payroll activities, employee benefits, health plans, retirement funds, insurance coverage, or other administrative functions? Please explain. All employees are employed with enervest	Yes ☒	No ☐
Does one (1) facility operation support the operation of the other facility?	Yes ☒	No ☐
Is one (1) facility dependent on the other? If one (1) facility shuts down, what are the limitations on the other to pursue outside business? Please explain. If the compressor shuts down the well cannot produce in a normal manor.	Yes ☒	No ☐
Are there any financial arrangements between the two (2) entities?	Yes ☐	No ☒
Are there any legal or lease agreements between the two (2) facilities?	Yes ☐	No ☒
Do the facilities share products, byproducts, equipment, or other manufacturing or air pollution control device equipment? Please explain. The share the natural gas	Yes ☒	No ☐
Do all the pollutant-emitting activities at the facilities belong to the same SIC Code? Please provide the SIC Codes. 1311	Yes ☒	No ☐
Was the location of the new facility chosen primarily because of its proximity to the existing facility to integrate the operation of the two (2) facilities? Please explain. All facilities had to be near the pipeline.	Yes ☒	No ☐
Will materials be routinely transferred between the two (2) facilities? Please explain the amount of transfer and how often the transfers take place and what percentages go to the various entities. Gas produced by the wells goes to the compressor stations.	Yes ☒	No ☐
Does the facility influence production levels or compliance with environmental regulations at other facilities? Who accepts the responsibility for compliance with air quality requirements? Please explain. If the compressor does not operate the wells will not produce. Michael Dearing	Yes ☒	No ☐

ATTACHMENT C – CURRENT BUSINESS CERTIFICATE

If the applicant is a resident of West Virginia, the applicant should provide a copy of the current Business Registration Certificate issued to them from the West Virginia Secretary of State's Office. If the applicant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration. This information is required for all sources to operate a business in West Virginia regardless of whether it is a construction, modification, or administrative update.

If you are a new business to West Virginia and have applied to the West Virginia Secretary of State's Office for a business license, please include a copy of your application.

Please note: Under the West Virginia Bureau of Employment Programs, 96CSR1, the DAQ may not grant, issue, or renew approval of any permit, general permit registration, or Certificate to Operate to any employing unit whose account is in default with the Bureau of Employment Programs Unemployment Compensation Division.

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
ENERVEST OPERATING LLC EASTERN DIVISION
300 CAPITOL ST 200
CHARLESTON, WV 25301-1794

BUSINESS REGISTRATION ACCOUNT NUMBER: **1051-6031**

This certificate is issued on: 05/27/2011

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.

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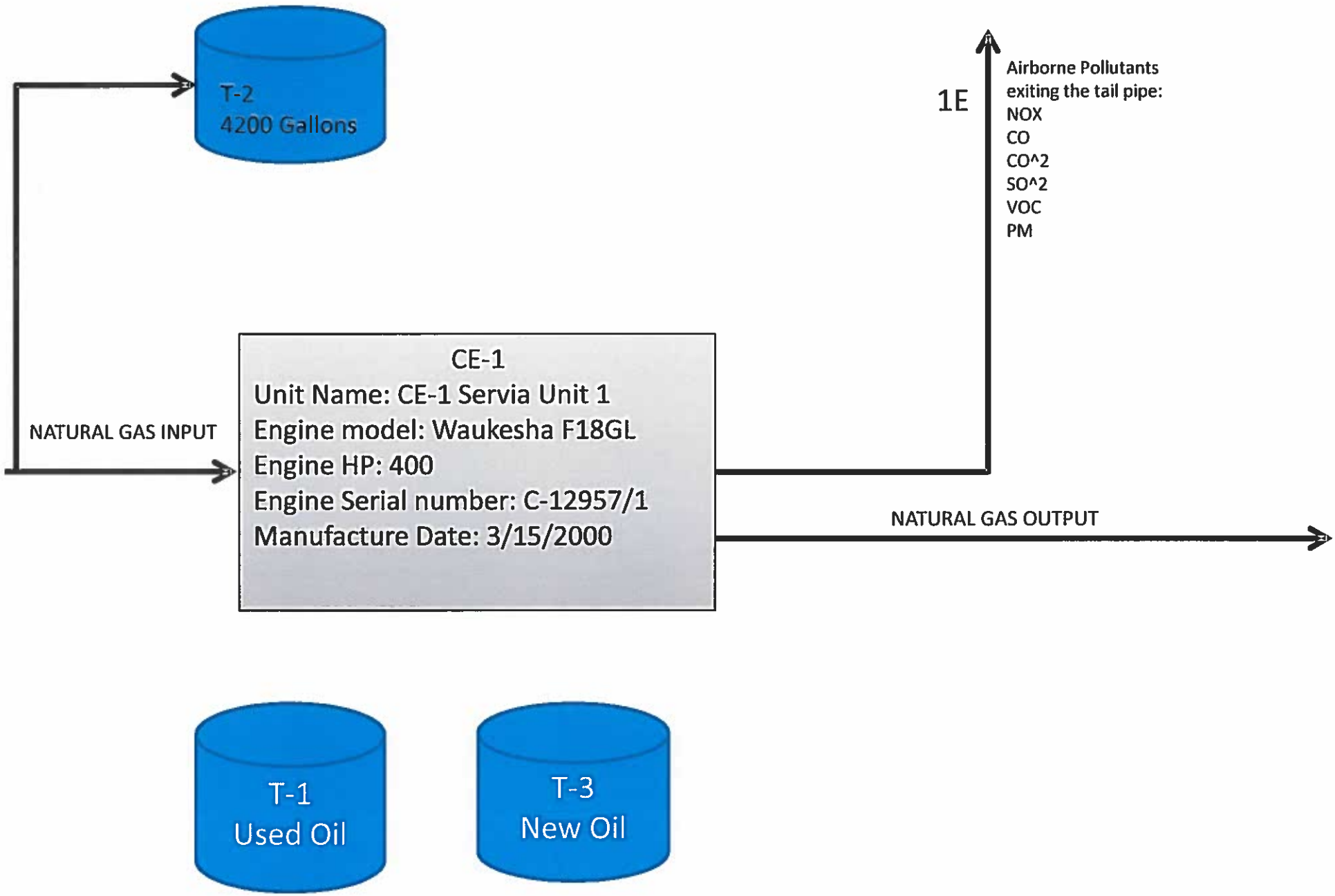
ATTACHMENT D – PROCESS FLOW DIAGRAM

Provide a diagram or schematic that supplements the process description of the operation. The process flow diagram must show all sources, components or facets of the operation in an understandable line sequence of operation. The process flow diagram should include the emission unit ID numbers, the pollution control device ID numbers, and the emission point ID numbers consistent with references in other attachments of the application. For a proposed modification, clearly identify the process areas, emission units, emission points, and/or control devices that will be modified, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete process flow diagram:

- The process flow diagram shall logically follow the entire process from beginning to end.
- Identify each emission source and air pollution control device with proper and consistent emission unit identification numbers, emission point identification numbers, and control device identification numbers.
- The process flow lines may appear different for clarity. For example, dotted lines may be used for vapor flow and solid lines used for liquid flow and arrows for direction of flow.
- The process flow lines may be color coded. For example: new or modified equipment may be red; old or existing equipment may be blue; different stages of preparation such as raw material may be green; and, finished product or refuse, another color.


T-2
4200 Gallons
1E
Airborne Pollutants
exiting the tail pipe:
NOX
CO
CO^2
SO^2
VOC
PM
NATURAL GAS INPUT
CE-1
Unit Name: CE-1 Servia Unit 1
Engine model: Waukesha F18GL
Engine HP: 400
Engine Serial number: C-12957/1
Manufacture Date: 3/15/2000
NATURAL GAS OUTPUT
T-1
Used Oil
T-3
New Oil

ATTACHMENT E – PROCESS DESCRIPTION

Provide a detailed written description of the operation for which the applicant is seeking a permit. The process description is used in conjunction with the process flow diagram to provide the reviewing engineer a complete understanding of the activity at the operation. Describe in detail and order the complete process operation.

Use the following guidelines to ensure a complete Process Description:

- The process flow diagram should be prepared first and used as a guide when preparing the process description. The written description shall follow the logical order of the process flow diagram.
- All emission sources, emission points, and air pollution control devices must be included in the process description.
- When modifications are proposed, describe the modifications and the effect the changes will have on the emission sources, emission points, control devices and the potential emissions.
- Proper emission source ID numbers must be used consistently in the process description, the process flow diagram, the emissions calculations, and the emissions summary information provided.
- Include any additional information that may facilitate the reviewers understanding of the process operation.

The process description is required for all sources regardless of whether it is a construction, modification, or administrative update.

Attachment – E

Natural Gas is produced from conventional oil and gas wells. The gas is then transported to the compressor station via pipeline. Once the gas is at the compressor station it is compressed to raise the natural gas pressure so that it can sent to the sales meter and to enter a higher pressure pipeline.

Modification: Nothing about the process at this facility is changing. Enervest is just downsizing the engine and compressor unit to more economically produce the decreasing volumes of gas at this facility. The decrease in volumes is due to the natural decline of the wells.

ATTACHMENT F – PLOT PLAN

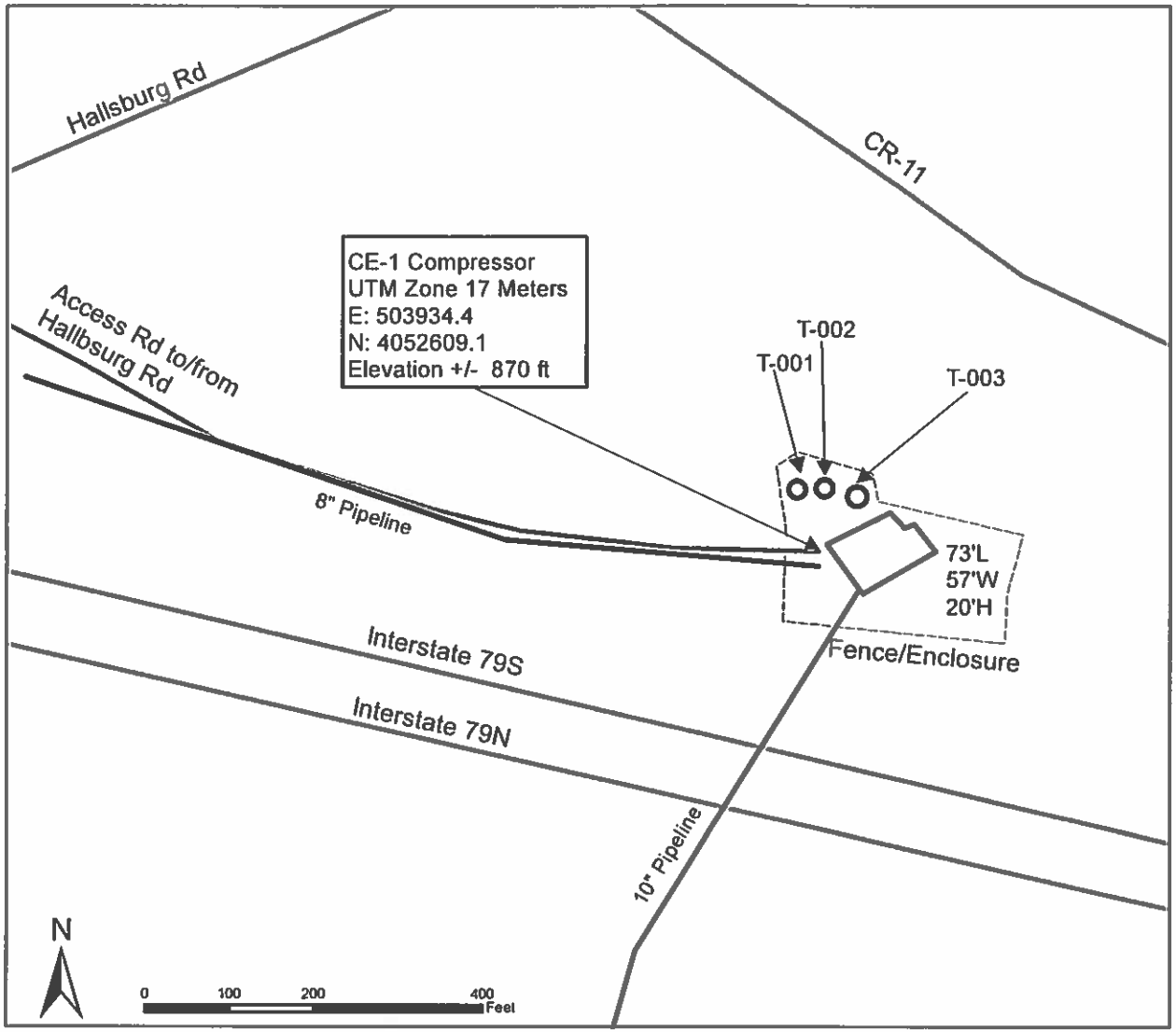
Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, emission unit sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

Use the following guidelines to ensure a complete Plot Plan:

- Facility name
- Company name
- Company facility ID number (for existing facilities)
- Plot scale, north arrow, date drawn, and submittal date.
- Facility boundary lines
- Base elevation
- Lat/Long reference coordinates from the area map and corresponding reference point elevation
- Location of all point sources labeled with proper and consistent source identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



EnerVest Operating, LLC

CE-1 Compressor
Braxton Co. WV

Attachment "F"

Base Elevation +/- 870 ft

Scale 1in = 200ft

Map Date: 7/12/2016

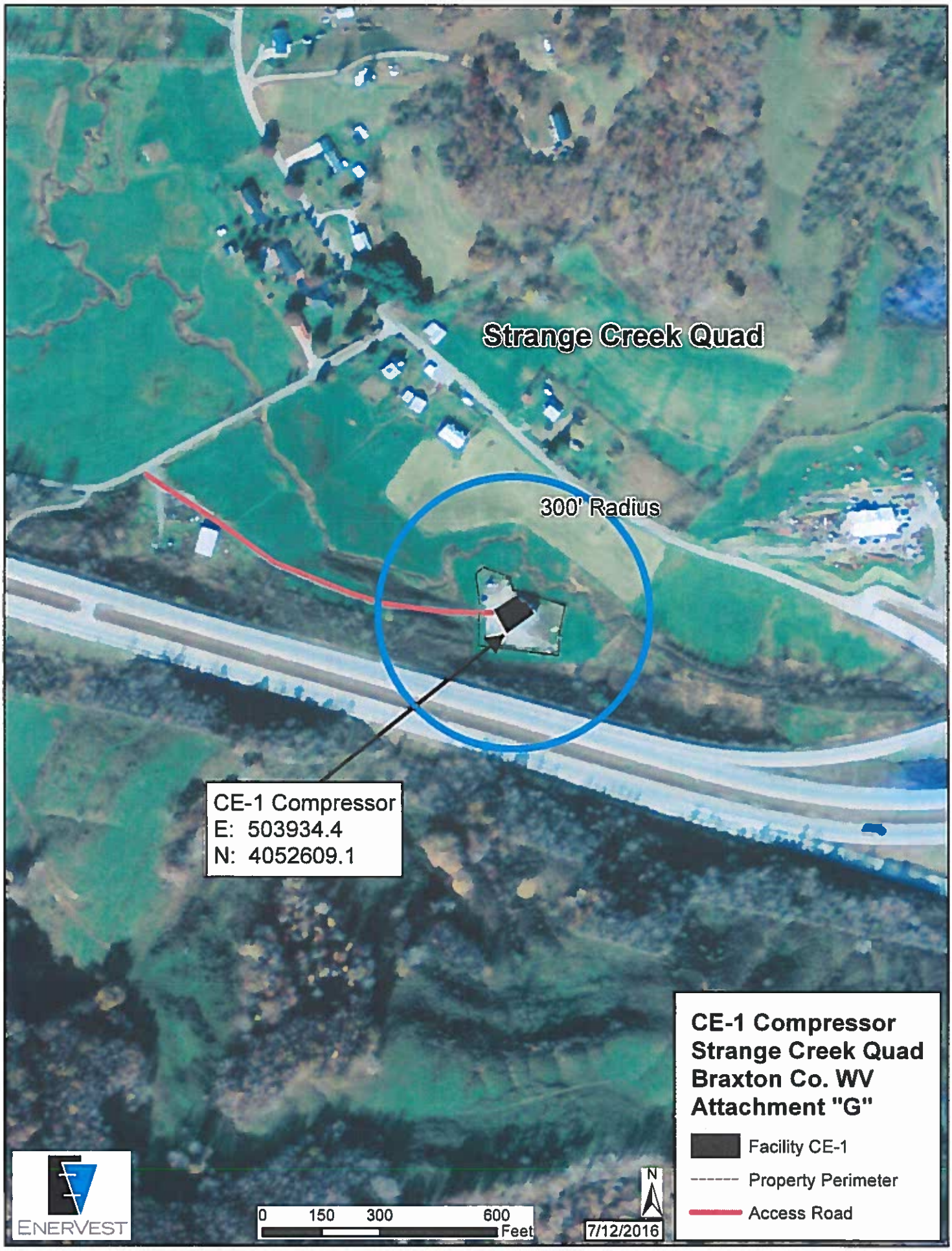
ENERVEST

ATTACHMENT G – AREA MAP

Provide an Area Map showing the current or proposed location of the operation. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park within a 300' boundary circle of the collective emission units.

Please provide a 300' boundary circle on the map surrounding the proposed emission units collectively.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.


Strange Creek Quad
300' Radius
CE-1 Compressor
E: 503934.4
N: 4052609.1
CE-1 Compressor
Strange Creek Quad
Braxton Co. WV
Attachment "G"
Facility CE-1
Property Perimeter
Access Road
ENERVEST
0 150 300 600
Feet
N
7/12/2016

ATTACHMENT H – G35-C SECTION APPLICABILITY FORM

General Permit G35-C Registration
Section Applicability Form

General Permit G35-C was developed to allow qualified applicants to seek registration for a variety of sources. These sources include storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G35-C allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

GENERAL PERMIT G35-C APPLICABLE SECTIONS	
☐Section 5.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐Section 6.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO)
☐Section 7.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO and/or NESHAP Subpart HH
☐Section 8.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐Section 9.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)
☐Section 10.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐Section 11.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐Section 12.0	Reciprocating Internal Combustion Engines, Generator Engines. Microturbine Generators
☐Section 13.0	Tanker Truck Loading[3]
☐Section 14.0	Glycol Dehydration Units[4]

1 *Applicants that are subject to Section 5 may also be subject to Section 6 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 7.*

2 *Applicants that are subject to Section 10 and 11 may also be subject to the applicable RICE requirements of Section 12.*

3 *Applicants that are subject to Section 13 may also be subject to control device and emission reduction device requirements of Section 7.*

4 *Applicants that are subject to Section 14 may also be subject to the requirements of Section 8 (reboilers). Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 7.*

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment K table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed	Manufac. Date[3]	Design Capacity	Type[4] and Date of Change	Control Device(s)[5]	ERD(s)[6]
CE-1	1E	Compressor engine	2016	3/15/2000	400HP	New	None	none

[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] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment: F001

Leak Detection Method Used	☒ Audible, visual, and olfactory (AVO) inspections	☒ Infrared (FLIR) cameras	☐ Other (please describe)	☐ None required

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)		
					VOC	HAP	GHG (CO_2e)
Pumps	☐ Yes ☒ No	2	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.003		1.07
Valves	☐ Yes ☒ No	15	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.049	0.001	15.05
Safety Relief Valves	☐ Yes ☒ No			☒ Gas ☐ Liquid ☐ Both			
Open Ended Lines	☐ Yes ☒ No	8	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.012		3.56
Sampling Connections	☐ Yes ☒ No			☒ Gas ☐ Liquid ☐ Both			
Connections (Not sampling)	☐ Yes ☒ No	78	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.011		3.48
Compressors	☐ Yes ☒ No			☒ Gas ☐ Liquid ☐ Both			
Flanges	☐ Yes ☒ No	20	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.005		1.73
Other[1]	☐ Yes ☒ No	8	EPA-453/R-95-017: TABLE 2-4.	☒ Gas ☐ Liquid ☐ Both	0.064		19.62

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.):

Please indicate if there are any closed vent bypasses (include component):
Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck loading, etc.)

41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

Source ID #[1]	Status[2]	Content[3]	Volume[4]
T-1	EXIST	USED Lube oil	2100
T-3	EXIST	NEW Lube Oil	1000
T-2	EXIST	Pipeline liquids	4200

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.
4. Enter the maximum design storage tank volume in gallons.

ATTACHMENT M – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#[1]	CE-1		
Engine Manufacturer/Model	Waukesha/ F18GL		
Manufacturers Rated bhp/rpm	400/1800		
Source Status[2]	NS		
Date Installed/ Modified/Removed/Relocated[3]	9/15/16		
Engine Manufactured /Reconstruction Date[4]	3/15/16		
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☒40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☒ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]	4SLB		
APCD Type[7]	NONE		
Fuel Type[8]	RG		
H_2S (gr/100 scf)	0		
Operating bhp/rpm	400/1800		
BSFC (BTU/bhp-hr)	7000		
Hourly Fuel Throughput	2800 ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	24.528 $MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	Pollutant[10]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]
MD	NO_x	1.764	7.725				
MD	CO	1.146	5.021				
AP-42	VOC	0.33	1.447				
AP-42	SO_2	0.002	0.007				
AP-42	PM_{10}	0.00	0.00				
AP-42	Formaldehyde	0.148	0.648				
AP-42	Total HAPs	0.148	0.648				
	GHG (CO_2e)						

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine locatedat the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Microturbine generator engines should be designated MT-1, MT-2, MT-3 etc. If more than three (3) engines exist, please use additional sheets.

2 Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Relocated Source
REM	Removal of Source		

3 Enter the date (or anticipated date) of the engine's installation (construction of source), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/JJJJ? If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation(s) using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Lean Burn & Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas /Production Gas	D	Diesel

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other	(please list)

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

ATTACHMENT P – PNEUMATIC CONTROLLERS DATA SHEET
Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011? ☐ Yes ☒ No Please list approximate number.
Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011? ☐ Yes ☒ No Please list approximate number.

ATTACHMENT R – EMISSIONS CALCULATIONS

Provide detailed potential to emit (PTE) emission calculations for criteria and hazardous air pollutants (HAPs) for each emission point identified in the application. For hazardous air pollutants and volatile organic compounds (VOCs), the speciated emission calculations must be included.

Use the following guidelines to ensure complete emission calculations:

- All emission sources and fugitive emissions are included in the emission calculations, as well as all methods used to calculate the emissions.
- Proper emission point identification numbers and APCD and ERD identification numbers are used consistently in the emission calculations that are used throughout the application.
- A printout of the emission summary sheets is attached to the registration application.
- Printouts of any modeling must be included with the emission calculations. The modeling printout must show all inputs/outputs or assumptions that the modeled emissions are based upon.
- If emissions are provided from the manufacturer, the manufacturer's documentation and/or certified emissions must also be included.
- The emission calculations results must match the emissions provided on the emissions summary sheet.
- If calculations are based on a compositional analysis of the gas, attach the laboratory analysis. Include the following information: the location that the sample was taken as representative; the date the sample was taken; and, if the sample is considered representative, the reasons that it is considered representative (same gas field, same formation and depth, distance from actual site, etc.).
- Provide any additional clarification as necessary. Additional clarification or information is especially helpful when reviewing modeling calculations to assist the engineer in understanding the basis of assumptions and/or inputs.

Please follow specific guidance provided on the emissions summary sheet when providing the calculations.

EPA-453/R-95-017: TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)													
Equipment	Counts	Gas Sevice kg/hr	kg/hr->lbs/hr	% VOC	% HAP	%CH4	VOC Emissons lbs/hr	HAP emissons lbs/hr	CH4 Emissons lbs/hr	VOC ton/yr	HAP tons/yr	CH4 ton/yr	CH4 CO2e
Valves	15	0.0045	0.00992079	0.0760	0.0020	0.9240	0.011310	0.000298	0.137502	0.049536	0.001304	0.602259	15.05648536
pump seals	2	0.0024	0.005291088	0.0760	0.0020	0.9240	0.000804	0.000021	0.009778	0.003523	0.000093	0.042827	1.070683403
other	10	0.0068	0.019400656	0.0760	0.0020	0.9240	0.014744	0.000388	0.179262	0.064581	0.001699	0.785168	19.62919573
connectors	78	0.0002	0.000440924	0.0760	0.0020	0.9240	0.002614	0.000069	0.031778	0.011448	0.000301	0.139189	3.479721061
flanges	20	0.00039	0.000859802	0.0760	0.0020	0.9240	0.001307	0.000034	0.015889	0.005724	0.000151	0.069594	1.73986053
open ended	8	0.002	0.00440924	0.0760	0.0020	0.9240	0.002681	0.000071	0.032593	0.011742	0.000309	0.142758	3.568944678
Facility Name:		Westline Well		Total:			0.033460	0.000881	0.406803	0.146555	0.003857	1.781796	44.544891
									10.170066				
	User Input	Table 2 - 4 EF	kg * 2.20462 = lbs	User Input			(lbs/hr*%voc)*N	(lbs/hr*%HAP)*N	(lbs/hr*%CH4)*N	(VOC lbs/hr*8760)/2000	(HAP lbs/hr*8760)/2000	(CH4 lbs/hr*8760)/2001	CH4 Tons *25
			Equation used:	ETOC = FA × WFTOC × N									

DRESSER **Waukesha**

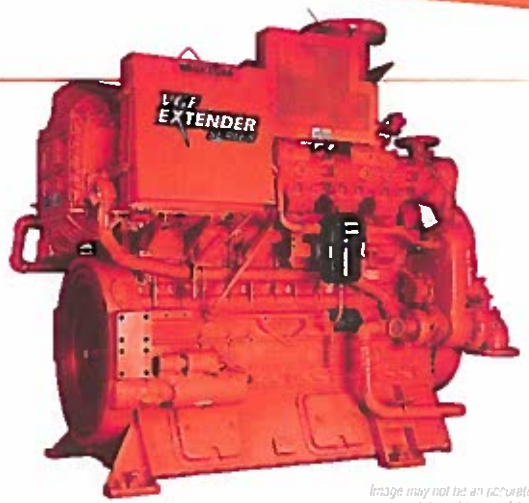
F18GL

VGF® Series Gas Engine
310 - 440 BHP (230 - 330 kWb)

Specifications

Cylinders: Inline 6
Piston Displacement: 1096 cu. in. (18 L)
Bore & Stroke: 5.98" x 6.5" (152 x 165 mm)
Compression Ratio: LCR 8.7:1, HCR 11:1
Jacket Water System Capacity: 16 gal. (60 L)
Lube Oil Capacity: 44 gal. (166 L)
Fuel Pressure Range: 25 - 50 psi (1.72 - 3.45 bar)
Starting System: 150 psi max. air/gas 24V DC electric
Dry Weight: 5725 lb. (2600 kg)

Cooling Water Flow at	**1500 rpm**	**1800 rpm**
Jacket Water gpm (l/m)	103 (390)	130 (492)
Aux. Water gpm (l/m)	25 (95)	40 (152)



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Standard Equipment

AIR CLEANER – Two stage, dry panel type with rain shield and service indicator. Engine mounted.

BARRING DEVICE – Manual.

BREATHER – Crankcase, closed type (mounted).

CARBURETOR – Single natural gas Impco 400 updraft.

COOLING SYSTEM – Jacket water: gear driven jacket water pump, thermostatically controlled, full flow bypass type with nominal 180° F (82° C) outlet temperature. Auxiliary water: thermostatically controlled, gear driven pump supplies water to intercooler and oil cooler circuit.

CONNECTING RODS – Drop forged alloy steel, angle split, serrated joint, oil jet piston pin lubrication.

CRANKCASE – Alloy cast iron, fully ribbed, integral with cylinder frame.

CRANKSHAFT – Drop forged alloy steel, dynamically balanced and fully counterweighted. Viscous vibration dampener.

CYLINDERS – Removable wet type liners of centrifugally cast alloy iron.

CYLINDER HEADS – Six interchangeable, valve–in–head type, with two hard faced intake and two hard faced exhaust valves per cylinder. Replaceable intake and exhaust valve seats. Mechanical valve lifters with pivoted roller followers.

EXHAUST SYSTEM – Water cooled exhaust manifold, Outlet flange for ANSI 8" 125# flange.

FLYWHEEL – With 150 tooth ring gear (for Delco electric and air/gas starters). Flywheel machined to accept SAE 620D, 18" (457 mm) diameter clutch.

FLYWHEEL HOUSING – SAE #0, nodular iron housing. Provision for two magnetic pickups and vertical mounting pads.

GOVERNOR – Woodward SG hydraulic with manual speed control.

IGNITION – Waukesha Custom Engine Control electronic ignition system with coils, cables, hall effect pick up, and spark plugs. Non–shielded. 24V DC power required. Includes emergency stop/service engine protection switch for local override of remote controls.

INTERCOOLER – Air–to–water.

LIFTING EYES – For engine only.

LUBRICATION SYSTEM – Gear type pump, full flow spin–on filters and industrial base type oil pan, 44 gallon (166 litres) capacity, including filters. Engine mounted plate type oil cooler.

MOUNTING – Base type oil pan.

PAINT – Oilfield orange.

PISTONS – Aluminum alloy, three ring, with patented high turbulence combustion bowl. Oil jet cooled with full floating piston pin. Low Compression Ratio (LCR) 8.7:1 for tolerance of low and varying fuel WKI®.

TURBOCHARGER – Exhaust driven, dry type with wastegate. For 1400 – 1800 rpm applications.

POWER RATINGS: F18GL VGF Series Gas Engines

Model	I.C. Water Inlet Temp.	C.R.	Bore & Stroke in. (mm)	Displ. cu. in. (litres)	Brake Horsepower (kWb)							
					1800 RPM		1600 RPM		1500 RPM		1400 RPM	
					C	I	C	I	C	I	C	I
F18GL	130° (54°)	11:1	5.98 x 6.5	1096 (18)	400	440	355	390	335	365	310	340
			(152 x 165)		(300)	(330)	(265)	(290)	(250)	(275)	(230)	(255)
F18GL	130° (54°)	8.6:1	5.98 x 6.5	1096 (18)	400	440	355	390	335	365	310	340
			(152 x 165)		(300)	(330)	(265)	(290)	(250)	(275)	(230)	(255)
F18GL*	130° (54°)	11:1	5.98 x 6.5	1096 (18)	440	—	390	—	365	—	340	—
			(152 x 165)		(330)	—	(290)	—	(275)	—	(255)	—

		1800 rpm		1500 rpm	
		C	I	C	I
	Power bhp (kWb)	400 (300)	440 (330)	335 (250)	365 (275)
	BSFC (LHV) Btu/bhp-hr (kJ/kWh)	7000 (9852)	6900 (9709)	6800 (9619)	6715 (9399)
	Fuel Consumption Btu/hr x 1000 (kW)	2800 (821)	3036 (890)	2278 (668)	2451 (718)
Emissions	NOx g/bhp-hr (mg/nm³ @ 5% O_2)	2.00 (810)	2.00 (822)	2.4 (982)	2.50 (1004)
Emissions	CO g/bhp-hr (mg/nm³ @ 5% O_2)	1.30 (535)	1.30 (541)	1.4 (563)	1.30 (519)
Emissions	THC g/bhp-hr (mg/nm³ @ 5% O_2)	1.7 (683)	1.60 (650)	2.1 (835)	2.00 (806)
Emissions	NMHC g/bhp-hr (mg/nm³ @ 5% O_2)	0.27 (108)	0.26 (105)	0.31 (125)	0.30 (122)
Heat Balance	Heat to Jacket Water Btu/hr x 1000 (kW)	738 (216)	785 (230)	627 (184)	662 (194)
Heat Balance	Heat to Lube Oil Btu/hr x 1000 (kW)	95 (28)	97 (28)	68 (20)	70 (20)
Heat Balance	Heat to Intercooler Btu/hr x 1000 (kW)	169 (49)	197 (58)	113 (33)	134 (39)
Heat Balance	Heat to Radiation Btu/hr x 1000 (kW)	74 (22)	74 (22)	69 (20)	69 (20)
Heat Balance	Total Exhaust Heat Btu/hr x 1000 (kW)	810 (237)	876 (257)	633 (186)	679 (199)
Intake/ Exhaust System	Induction Air Flow scfm (Nm^3/hr)	860 (1320)	932 (1432)	699 (1075)	752 (1156)
Intake/ Exhaust System	Exhaust Flow lb/hr (kg/hr)	3748 (1699)	4063 (1843)	3048 (1383)	3280 (1488)
Intake/ Exhaust System	Exhaust Temperature °F (°C)	836 (447)	839 (448)	807 (430)	802 (428)

* These power ratings require Price Book Code 1100, and are available continuously when applied per WKI® power and timing curve S7079-19. It is permissible to operate at up to 5% overload for two hours in each 24 hour period.

Typical heat data is shown, however no guarantee is expressed or implied. Consult your Dresser Waukesha Application Engineering Department for system application assistance.

All natural gas engine ratings are based on a fuel of 900 Btu/ft³ (35.3 MJ/nm³) SLHV, with a 91 WKI®. For conditions or fuels other than standard, consult the Dresser Waukesha Application Engineering Department.

Data based on standard conditions of 77°F (25°C) ambient temperature, 29.53 inches Hg (100kPa) barometric pressure, 30% relative humidity (0.3 inches HG / 1 kPa water vapor pressure).

Fuel consumption based on ISO3046/1-1995 with a tolerance of +5% for commercial quality natural gas having a 900 BTU/ft³ (35.3 MJ/nm³) SLHV.

Heat data based on fuel consumption +2%.

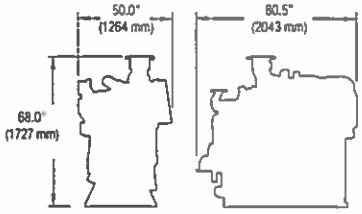
Heat rejection based on cooling exhaust temperature to 77°F (25°C).

Rating Standard: All models - Ratings are based on ISO 3046/1-1986 with mechanical efficiency of 90% and Tcra (clause 10.1) as specified above limited to ± 10° F (5° C). Ratings are also valid for SAE J1349, BS5514, DIN6271 and AP17B-11C standard atmospheric conditions.

C = ISO Standard Power/Continuous Power Rating: The highest load and speed which can be applied 24 hours per day, seven days per week, 365 days per year except for normal maintenance. It is permissible to operate the engine at up to 10% overload, or a maximum load indicated by the intermittent rating, whichever is lower, for two hours in every 24 hour period.

I = Intermittent Service Rating: The highest load and speed that can be applied in variable speed mechanical system application only. Operation at this rating is limited to a maximum of 3500 hours per year.

Consult your local Waukesha representative for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.



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DRESSER Waukesha

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www.dresser.com/waukesha

Lean Burn Engines 4 Stroke AP 42 Table 3.2-1

Emissions Unit ID:	CE-1	BHP	400	BTU Content of Gas:	1000
Fuel Usage in MMBTU/hr:	2.800	Fuel Consumption BTU/BHP-hr	7000	Date of manufacture:	3/15/2000
Make:	Waukesha	Model:	F18GL	Serial number:	C-12957/1
Pollutants		Emission Factor	lbs./hr	Tons Year	G/bhp-hr
SOX ton/yr		0.000588	0.002	0.007	0.002
VOC		0.118000	0.330	1.447	0.375
PM10 (filterable)		0.000077	0.000	0.001	0.000
PM2.5 (filterable)		0.000077	0.000	0.001	0.000
Formaldehyde(CH2O)		0.052800	0.148	0.648	0.168
Calculations		EF	MMBTU x EF = lbs/hr	(lbs/hr)/2000	(lbs-hr*453.592)/BPH

Emissions Calculator Based on Spec sheet Data @ 100% Load

Pollutant	Unit BHP	Emissions g/BHP-Hr	Grams Per hour	lbs-hr	Tons/yr
NOX	400	2	800.0	1.764	7.725
CO	400	1.3	520.0	1.146	5.021
THC (Total Hydrocarbons)	400	1.7	680.0	1.499	6.566
NMHC (Non CH4 hydrocarbons)	400	0.27	108.0	0.238	1.043
Calculations			(BHP*G/HP-hr)*8760	g-hr * 0.00220462	lbs-hr*8760/2000

Fuel Usage Calculator

Rated BHP	BTU/BHP-Hr	MMBTU/ Hr	BTU Content:	Total BTU/Hr	Total BTU Year
400	7000	2.800	1000	2800000	24528000000
		(Bhp x Btu/Bhp-hr)/1,000,000		Bhp x Btu/Bhp-hr	TBtu/Bhp-hr x 8760
MMBTU/hr	MCF/HOUR	SCF / HOUR	SCF/YR	MCF/YEAR	MMSCF/YR
2.8	2.8	2800	24528000	24528	24.528
	SCF-HR/1000	TBtu HR/ Btu Content	SCF-HR*8760	SCF-YR/1000	SCF-YR/1,000,000

ATTACHMENT S – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-1	1.76	7.725	1.146	5.021	0.33	1.45	0.002	0.007	0.00	0.00	0.00	0.00		
F001					0.033	0.146							10.17	44.54
TOTAL	1.76	7.725	1.146	5.021	0.363	1.596	0.002	0.007	0.00	0.00	0.00	0.00	10.17	44.54

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT S – FACILITY-WIDE HAP CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1E	0.148	0.648	0	0	0	0	0	0	0	0	0	0	0.148	0.648
F001	0	0	0	0	0	0	0	0	0	0	0.00	0.004	0	0.004
TOTAL	0.148	0.648	0	0	0	0	0	0	0	0	0	0.004	0.148	0.652

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.