ENERVEST

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WV DEP / DIV OF AIR QUALITY

7/24/2015

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

I.D. No. 109-00167 Reg. PD15-073
Company Enervest Operating
Facility Dry Branch Station #
Initials WEX

**Subject: EnerVest Operating Compression Downsizing Project Dry Branch (PD11-026) Plant ID(109-00167).**

Dear Sir or Madame,

We are removing the Caterpillar G3304 rated at 95HP currently at this facility and placing an Arrow VRG-330 rated at 68HP at this facility. Since this facility already had a determination I would like to update it to remove the current unit and receive a determination for the new unit. 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

Entire Document
NON-CONFIDENTIAL

west virginia department of environmental protection

Division of Air Quality
601 57th Street, S.E.
Charleston, WV 25304

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.wvdep.org

June 10, 2011

Charity Fleenor
Safety & Environmental Engineer
Penn Virginia Oil & Gas Corporation
Three Radnor Corporate Center, Suite 300
100 Matsonford Road
Radnor, PA 19087

Re: Permit Applicability Determination
Penn Virginia Oil & Gas Corporation
Dry Branch Station
Wyoming County, WV
Determination No. PD11-026
Plant ID No. 109-00167

Dear Ms. Fleenor:

It has been determined that a permit will not be required for your proposed installation and operation of a Caterpillar G3304NA natural gas fired compressor engine and the removal of the existing Ford 4.2 Liter compressor engine at the above referenced facility. This determination is based on information included with your Permit Determination Form (PDF) received on May 23, 2011, which indicates that the increase in emissions will not exceed two (2) lbs/hr or five (5) tons/year of total Hazardous Air Pollutants (HAPs); six (6) lbs/hour and ten (10) TPY of any regulated pollutant; or, trigger a substantive requirement of any State or Federal air quality regulation.

Please bear in mind, however, that any additional changes to the proposed facility, may require a permit under 45CSR13. Furthermore, pursuant to 45CSR13-5.14, records briefly describing the proposed change, the pollutants involved, the potential to emit for each pollutant increased or added shall be maintained by the owner or operator for at least two years and made available to the Director upon request.

Should you have any questions, please contact the undersigned engineer at (304) 926-0499 Ext. 1211.

Sincerely,

William T. Rothwell II, P.E.

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/daq

# PERMIT DETERMINATION FORM (PDF)

FOR AGENCY USE ONLY: PLANT I.D. # 109-00167
PDF # 15-073 PERMIT WRITER WTR

RECEIVED AUG 7 2015 WV DEP / DIV OF AIR QUALITY

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Enervest Operating

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):
Dry Branch Compressor Station

3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (**NAICS**) CODE:
211111

4A. MAILING ADDRESS: 300 Capitol St #200, Charleston, WV 25301

4B. PHYSICAL ADDRESS:

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE **MAP** AS **ATTACHMENT A**):

5B. NEAREST ROAD: Wildwood lane.

5C. NEAREST CITY OR TOWN: Oceana, WV

5D. COUNTY: WYOMING

5E. UTM NORTHING (KM): 4173.13102

5F. UTM EASTING (KM): 443.941

5G. UTM ZONE: 17S

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED: Michael Dearing

6B. TITLE: Supervisor - Air Emissions

6C. TELEPHONE: 304-414-8171

6D. FAX:

6E. E-MAIL: mdearing@enervest.net

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY): 109-00038

7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH **THIS** PROCESS (FOR AN EXISTING FACILITY ONLY):

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:

8A. TYPE OF EMISSION SOURCE (CHECK ONE):
☒ **NEW SOURCE** ☐ **ADMINISTRATIVE UPDATE**
☐ **MODIFICATION** ☐ **OTHER** (PLEASE EXPLAIN IN 11B)

8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
☒ **YES** ☐ **NO**

9. IS *DEMOLITION* OR PHYSICAL *RENOVATION* AT AN EXISTING FACILITY INVOLVED? ☐ **YES** ☐ **NO**

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE: 08 / 20 /2015 .

10B. DATE OF ANTICIPATED START-UP: 08 / 20 /2015 .

11A. PLEASE PROVIDE A **DETAILED PROCESS FLOW DIAGRAM** SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS **ATTACHMENT B**.

11B. PLEASE PROVIDE A **DETAILED PROCESS DESCRIPTION** AS **ATTACHMENT C**.

12. PLEASE PROVIDE **MATERIAL SAFETY DATA SHEETS (MSDS)** FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS **ATTACHMENT D**. FOR CHEMICAL PROCESSE, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. **REGULATED AIR POLLUTANT EMISSIONS:**

⇒ **FOR A NEW FACILITY,** PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ **FOR AN EXISTING FACILITY,** PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

*PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.*

| POLLUTANT | HOURLY PTE (LB/HR) | YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON |
|---|---|---|
| PM | 0.005 | 0.024 |
| $PM_{10}$ | 0.005 | 0.023 |
| VOCs | 0.016 | 0.071 |
| CO | 0.166 | 0.725 |
| $NO_x$ | 1.942 | 8.504 |
| $SO_2$ | 0.00 | 0.001 |
| Pb | 0 | 0 |
| HAPs (AGGREGATE AMOUNT) | 0.011 | 0.049 |
| TAPs (INDIVIDUALLY)* | | |
| OTHER (INDIVIDUALLY)* | | |

* ATTACH ADDITIONAL PAGES AS NEEDED

13B. PLEASE PROVIDE ALL **SUPPORTING CALCULATIONS** AS **ATTACHMENT E.**

*CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).*

14. **CERTIFICATION OF DATA**

I, James D. McKinney (*TYPE NAME*) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A ***RESPONSIBLE OFFICIAL*** (*PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR*) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: _____

TITLE: Senior Vice President DATE: 7 / 30 / 2013.

**THE DEFINITION OF THE PHRASE '***RESPONSIBLE OFFICIAL***' CAN BE FOUND AT 45CSR13, SECTION 2.23.

**NOTE:** PLEASE CHECK ENCLOSED ATTACHMENTS

☒ **ATTACHMENT A** ☒ **ATTACHMENT B** ☒ **ATTACHMENT C** ☒ **ATTACHMENT D** ☒ **ATTACHMENT E**

***RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.***

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:

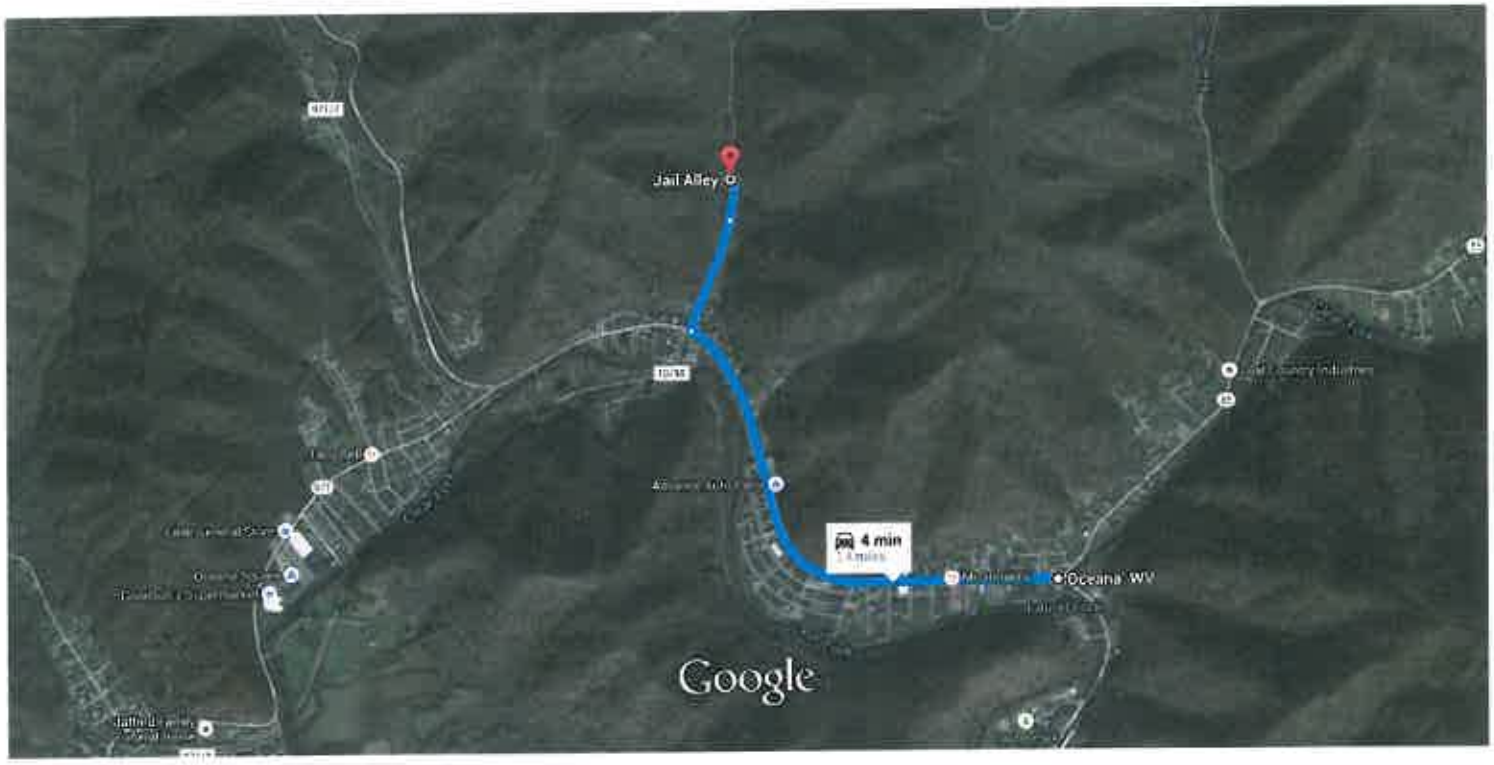
***www.dep.wv.gov/daq***

# Attachment A

# Oceana to Jail Alley, Cyclone, WV 24827

Dry Branch

Drive 1.4 miles, 4 min




## Oceana, WV

1. Head **west** on **WV-10 N/Cook Pkwy** toward **Harding St**

1.1 mi

2. Turn **right** onto **Wildwood Ln**

0.2 mi

3. Continue onto **Jail Alley**

Destination will be on the left

449 ft

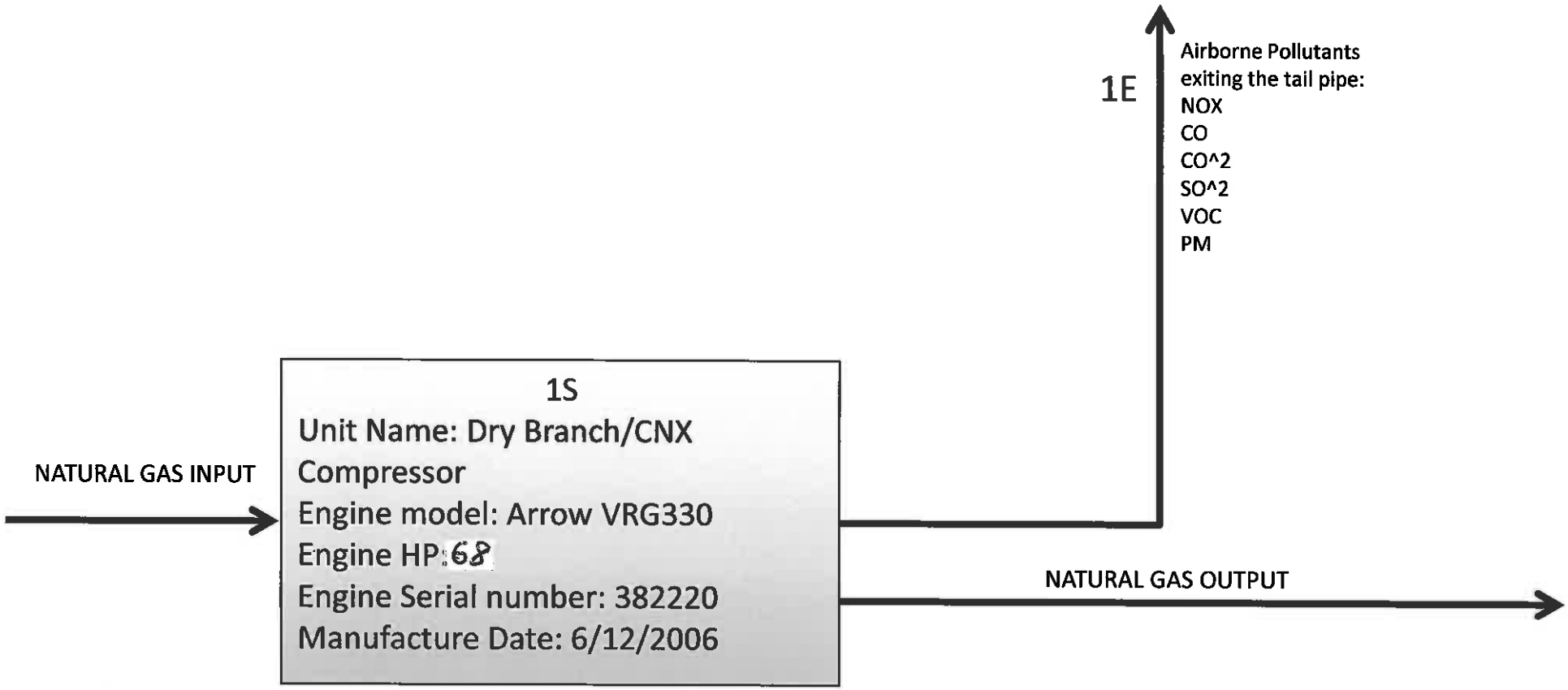
## Jail Alley

Cyclone, WV 24827

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Imagery ©2015 Commonwealth of Virginia, DigitalGlobe, USDA Farm Service Agency, Map data ©2015 Google 1000 ft

# Attachment B


1E
Airborne Pollutants
exiting the tail pipe:
NOX
CO
CO^2
SO^2
VOC
PM
NATURAL GAS INPUT
1S
Unit Name: Dry Branch/CNX
Compressor
Engine model: Arrow VRG330
Engine HP: 68
Engine Serial number: 382220
Manufacture Date: 6/12/2006
NATURAL GAS OUTPUT

# Attachment C

This Engine is used to power a compressor which is then used to compress natural gas to allow Enervest to produce natural gas wells more efficiently.

# Attachment D

# Natural Gas

**Safety Data Sheet**

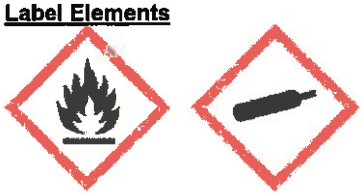
## Section 1: Identification of the substance or mixture and of the supplier

| | |
|---|---|
| **Product Name:** | Natural Gas |
| **SDS Number:** | 724330 |
| **Synonyms/Other Means of Identification:** | Fuel Gas<br>Residue Gas<br>Processed Gas<br>Natural Gas, Dry<br>Compressed Natural Gas |
| **Intended Use:** | Fuel |
| **Manufacturer:** | ConocoPhillips<br>600 N. Dairy Ashford<br>Houston, Texas 77079-1175 |
| **Emergency Health and Safety Number:** | Chemtrec: 800-424-9300 (24 Hours) |
| **SDS Information:** | Phone: 855-244-0762<br>Email: SDS@conocophillips.com<br>URL: www.conocophillips.com |

## Section 2: Hazard(s) Identification

**GHS Classification**
H220 -- Flammable gases -- Category 1
H280 -- Gases under pressure -- Compressed gas

**Label Elements**



**DANGER**
**Extremely flammable gas. (H220)***
**Contains gas under pressure. May explode if heated. (H280)***
**Gas may reduce oxygen in confined spaces.**

**Precautionary Statement(s):**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)*
Leaking gas fire: Do not extinguish, unless leak can be stopped safely. (P377)*
Eliminate all ignition sources if safe to do so. (P381)*
Protect from sunlight. Store in a well ventilated place. (P410+P403)*

** (Applicable GHS hazard code.)*

## Section 3: Composition / Information on Ingredients

| Component | CASRN | Concentration[1] |
|---|---|---|
| Natural gas, dried | 68410-63-9 | 100 |

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## Section 4: First Aid Measures

**Eye Contact:** If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

**Skin Contact:** First aid is not normally required. However, it is good practice to wash any chemical from the skin.

**Inhalation (Breathing):** If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If breathing is difficult, oxygen or artificial respiration should be administered by qualified personnel. If symptoms persist, seek medical attention.

**Ingestion (Swallowing):** This material is a gas under normal atmospheric conditions and ingestion is unlikely.

**Most important symptoms and effects**

**Acute:** Anesthetic effects at high concentrations.

**Delayed:** None known or anticipated. See Section 11 for information on effects from chronic exposure, if any.

**Notes to Physician:** Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

## Section 5: Fire-Fighting Measures

**NFPA 704 Hazard Class**

**Health:** 1 **Flammability:** 4 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**Unusual Fire & Explosion Hazards:** Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire. Contents under pressure.

**Extinguishing Media:** Dry chemical or carbon dioxide is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

**Fire Fighting Instructions:** For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. If this cannot be done, allow fire to burn. Move undamaged containers from immediate hazard area if it can be done safely. Stay away from ends of container. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely.

**Hazardous Combustion Products:** Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

**See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits**

## Section 6: Accidental Release Measures

**Personal Precautions:** Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Beware of accumulation of gas in low areas or contained areas, where explosive concentrations may occur. Prevent from entering drains or any place where accumulation may occur. Ventilate area and allow to evaporate. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

**Environmental Precautions:** Stop spill/release if it can be done safely. Water spray may be useful in minimizing or dispersing vapors. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

**Methods for Containment and Clean-Up:** Notify relevant authorities in accordance with all applicable regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

## Section 7: Handling and Storage

**Precautions for safe handling:** Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Contents under pressure. Gas can accumulate in confined spaces and limit oxygen available for breathing. Use only with adequate ventilation. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Cold burns may occur during filling operations. Containers and delivery lines may become cold enough to present cold burn hazard.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

**Conditions for safe storage:** Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. Avoid exposing any part of a compressed-gas cylinder to temperatures above 125F(51.6C). Gas cylinders should be stored outdoors or in well ventilated storerooms at no lower than ground level and should be quickly removable in an emergency.

## Section 8: Exposure Controls / Personal Protection

| Component | ACGIH | OSHA | Other |
|---|---|---|---|
| Natural gas, dried | 1000 ppm TWA<br>as Aliphatic Hydrocarbons C1-4 | — | — |

**Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.**

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

**Eye/Face Protection:** The use of eye/face protection is not normally required; however, good industrial hygiene practice suggests the use of eye protection that meets or exceeds ANSI Z.87.1 whenever working with chemicals.

**Skin/Hand Protection:** The use of skin protection is not normally required; however, good industrial hygiene practice suggests the use of gloves or other appropriate skin protection whenever working with chemicals.

**Respiratory Protection:** A NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used in situations of oxygen deficiency (oxygen content less than 19.5 percent), unknown exposure concentrations, or situations that are immediately dangerous to life or health (IDLH).

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use.

**Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.**

## Section 9: Physical and Chemical Properties

**Note:** Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

| | |
|---|---|
| **Appearance:** | Colorless |
| **Physical Form:** | Compressed Gas |
| **Odor:** | Slight hydrocarbon |
| **Odor Threshold:** | No data |
| **pH:** | Not applicable |
| **Vapor Density (air=1):** | 0.5 |
| **Initial Boiling Point/Range:** | No data |
| **Melting/Freezing Point:** | No data |
| **Solubility in Water:** | Slight |
| **Partition Coefficient (n-octanol/water) (Kow):** | No data |
| **Percent Volatile:** | 100% |
| **Flammability (solid, gas):** | Extremely Flammable |
| **Evaporation Rate (nBuAc=1):** | No data |
| **Flash Point:** | -299 °F / -184 °C |
| **Test Method:** | (estimate) |
| **Lower Explosive Limits (vol % in air):** | 2.0 |
| **Upper Explosive Limits (vol % in air):** | 10.0 |
| **Auto-ignition Temperature:** | 999 °F / 537 °C |

## Section 10: Stability and Reactivity

**Stability:** Stable under normal ambient and anticipated conditions of use.

**Conditions to Avoid:** Avoid all possible sources of ignition. Heat will increase pressure in the storage tank.

**Materials to Avoid (Incompatible Materials):** Avoid contact with acids, aluminum chloride, chlorine, chlorine dioxide, halogens and oxidizing agents.

**Hazardous Decomposition Products:** Not anticipated under normal conditions of use.

**Hazardous Polymerization:** Not known to occur.

## Section 11: Toxicological Information

**Information on Toxicological Effects of Substance/Mixture**

| Acute Toxicity | Hazard | Additional Information | LC50/LD50 Data |
|---|---|---|---|
| **Inhalation** | Unlikely to be harmful | Asphyxiant. High concentrations in confined spaces may limit oxygen available for breathing. See Signs and Symptoms. | > 20,000 ppm (gas) |
| **Skin Absorption** | Skin absorption is not anticipated | | Not Applicable |
| **Ingestion (Swallowing)** | Ingestion is not anticipated | | Not Applicable |

**Aspiration Hazard:** Not applicable

**Skin Corrosion/Irritation:** Skin exposure is not anticipated.

**Serious Eye Damage/Irritation:** Not expected to be irritating.

**Signs and Symptoms:** Light hydrocarbon gases are simple asphyxiants and can cause anesthetic effects at high concentrations. Symptoms of overexposure, which are reversible if exposure is stopped, can include shortness of breath, drowsiness, headaches, confusion, decreased coordination, visual disturbances and vomiting. Continued exposure can lead to hypoxia (inadequate oxygen), rapid breathing, cyanosis (bluish discoloration of the skin), numbness of the extremities, unconsciousness and death.

**Skin Sensitization:** Skin contact is not anticipated.

**Respiratory Sensitization:** Not expected to be a respiratory sensitizer.

**Specific Target Organ Toxicity (Single Exposure):** Not expected to cause organ effects from single exposure.

**Specific Target Organ Toxicity (Repeated Exposure):** Not expected to cause organ effects from repeated exposure.

**Carcinogenicity:** Not expected to cause cancer. This substance is not listed as a carcinogen by IARC, NTP or OSHA.

**Germ Cell Mutagenicity:** Not expected to cause heritable genetic effects.

**Reproductive Toxicity:** Not expected to cause reproductive toxicity.

**Other Comments:** High concentrations may reduce the amount of oxygen available for breathing, especially in confined spaces. Hypoxia (inadequate oxygen) during pregnancy may have adverse effects on the developing fetus.

## Section 12: Ecological Information

**Toxicity:** Petroleum gases will readily evaporate from the surface and would not be expected to have significant adverse effects in the aquatic environment. Classification: No classified hazards.

**Persistence and Degradability:** The hydrocarbons in this material are expected to be inherently biodegradable. In practice, hydrocarbon gases are not likely to remain in solution long enough for biodegradation to be a significant loss process. Hydrogen sulfide, if present in refinery gas streams, will be rapidly oxidized in water and insoluble sulfides precipitated from water when metallic radicals are present.

**Bioaccumulative Potential:** Since the log Kow values measured for refinery gas constituents are below 3, they are not regarded as having the potential to bioaccumulate.

**Mobility in Soil:** Due to the extreme volatility of petroleum gases, air is the only environmental compartment in which they will be found. In air, these hydrocarbons undergo photodegradation by reaction with hydroxyl radicals with half-lives ranging from 3.2 days for n-butane to 7 days for propane.

**Other Adverse Effects:** None anticipated.

## Section 13: Disposal Considerations

This material is a gas and would not typically be managed as a waste.

## Section 14: Transport Information

**U.S. Department of Transportation (DOT)**

| | |
|---|---|
| **Shipping Description:** | UN1971, Natural gas, compressed, 2.1 |
| **Non-Bulk Package Marking:** | Natural gas, compressed, UN1971 |
| **Non-Bulk Package Labeling:** | Flammable gas |
| **Bulk Package/Placard Marking:** | Flammable gas / 1971 |
| **Packaging - References:** | 49 CFR 173.306; 173.302; 173.302 ***(Exceptions; Non-bulk; Bulk)*** |
| **Hazardous Substance:** | None |
| **Emergency Response Guide:** | 115 |

**Note:** ***Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:*** *Not applicable*

**International Maritime Dangerous Goods (IMDG)**

| | |
|---|---|
| **Shipping Description:** | UN1971, Natural gas, compressed, 2.1 |
| **Non-Bulk Package Marking:** | Natural gas, compressed, UN1971 |
| **Labels:** | Flammable gas |
| **Placards/Marking (Bulk):** | Flammable gas / 1971 |
| **Packaging - Non-Bulk:** | P200 |
| **EMS:** | F-D, S-U |

**International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)**

| | |
|---|---|
| **UN/ID #:** | UN1971 |
| **Proper Shipping Name:** | Natural gas, compressed |
| **Hazard Class/Division:** | 2.1 |
| **Subsidiary risk:** | None |
| **Packing Group:** | None |
| **Non-Bulk Package Marking:** | Natural gas, compressed, UN1971 |
| **Labels:** | Flammable gas , Cargo Aircraft Only |
| **ERG Code:** | 10L |

| | LTD. QTY | Passenger Aircraft | Cargo Aircraft Only |
|---|---|---|---|
| **Packaging Instruction #:** | *Forbidden* | *Forbidden* | 200 |
| **Max. Net Qty. Per Package:** | *Forbidden* | *Forbidden* | 150 kg |

## Section 15: Regulatory Information

**CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):**
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

**CERCLA/SARA - Section 311/312 (Title III Hazard Categories)**

| | |
|---|---|
| **Acute Health:** | Yes |
| **Chronic Health:** | No |
| **Fire Hazard:** | Yes |
| **Pressure Hazard:** | Yes |
| **Reactive Hazard:** | No |

**CERCLA/SARA - Section 313 and 40 CFR 372:**
This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

**EPA (CERCLA) Reportable Quantity (in pounds):**
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

**California Proposition 65:**
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

**International Hazard Classification**

**Canada:**
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

**WHMIS Hazard Class:**
A - Compressed Gas
B1 - Flammable Gases

**National Chemical Inventories**
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
All components are either on the DSL, or are exempt from DSL listing requirements

**U.S. Export Control Classification Number:** EAR99

## Section 16: Other Information

| | |
|---|---|
| **Date of Issue:** | 02-Apr-2012 |
| **Status:** | FINAL |
| **Previous Issue Date:** | 09-Feb-2012 |
| **Revised Sections or Basis for Revision:** | Identified Hazards (Section 2)<br>Precautionary Statement(s) (Section 2)<br>First Aid (Section 4)<br>Shipping information (Section 14)<br>Regulatory information (Section 15) |
| **SDS Number:** | 724330 |

**Guide to Abbreviations:**
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

**Disclaimer of Expressed and implied Warranties:**
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

# Attachment E

| Rich Burn Engines 4 Stroke AP 42 Table 3.2-1 | | | | | |
|---|---|---|---|---|---|
| Emissions Unit ID: | Dry Branch CS | BHP | 68 | BTU Content of Gas: | 1000 |
| Fuel Usage in MMBTU/hr: | 0.547 | Fuel Consumption BTU/BHP-hr | 8038 | Date of manufacture: | pre 6/12/06 |
| Make: | Arrow | Model: | VRG 330 | Serial number: | 382220 |
| Pollutants | | Emission Factor | lbs./hr | Tons Year | G/bhp-hr |
| SOX ton/yr | | 0.000588 | 0.000 | 0.001 | 0.002 |
| VOC | | 0.029600 | 0.016 | 0.071 | 0.108 |
| PM10 (filterable) | | 0.009500 | 0.005 | 0.023 | 0.035 |
| PM Condensable | | 0.009910 | 0.005 | 0.024 | 0.036 |
| Formaldehyde(CH2O) | | 0.020500 | 0.011 | 0.049 | 0.075 |
| 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 | 68 | 12.951 | 880.7 | 1.942 | 8.504 |
| CO | 68 | 1.104 | 75.1 | 0.166 | 0.725 |
| 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 |
| 68 | 8038 | 0.547 | 1000 | 546584 | 4788075840 |
| | | (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 |
| 0.546584 | 0.546584 | 546.584 | 4788075.84 | 4788.07584 | 4.78807584 |
| | SCF-HR/1000 | TBtu HR/ Btu Content | SCF-HR*8760 | SCF-YR/1000 | SCF-YR/1,000,000 |

Jul 16, 2015

Kelsey Watkins
Exterran
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Houston, TX 77060

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Re: Engine Pedigree for Exterran Compressor Unit 401234, Engine Serial Number 382220

In order to better assist your company with any of its state and federal permitting needs, Exterran submits the following information in regards to the engine of the above-referenced compressor unit, which Exterran is currently utilizing to provide your company contract compression services. This letter should provide information necessary to answer questions pertaining to, but not limited to, the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines, Subpart JJJJ. This information is current as of Jul 16, 2015.

| | |
|---|---|
| **Engine Make:** | ARROW |
| **Engine Model:** | VRG330 |
| **Engine Serial Number:** | 382220 |
| **Engine Type:** | 4 Stroke RB |
| **Engine Category:** | Existing |
| **Engine Subcategory:** | Non Certified |
| **Engine NSPS Status*:** | Exempt |
| **Exemption Justification*:** | Overhauls since 6/12/06 have not triggered recon./modif. |
| **Engine Speed:** | 1800.00 |
| **OEM Rated HP:** | 68.00 |
| **Engine Manufacture Date:** | Pre June 12, 2006 |
| **Customer:** | ENERVEST |
| **Business Unit:** | Northeast |
| **Exterran Unit Number:** | 401234 |
| **Customer Lease Name:** | DRY BRANCH/CNX |

Please contact Kyle Poycker with any questions at or kyle.poycker@exterran.com.

* The "Engine NSPS Status" and "Exemption Justification" entries herein are based on Exterran's present knowledge of the engine in question and its reading of U.S. EPA's regulations and guidance pursuant to 40 C.F.R. Part 60, Subpart JJJJ. Any change in law or in the federal, state, or local interpretation of existing law could result in this engine being subject to additional or different legal requirements. These conclusions are Exterran's and are not offered as legal opinions or advice to your company. Additionally, any reconstruction or modification respecting this engine (as those terms are defined in the applicable regulations) could result in the applicability of Subpart JJJJ or other legal requirements to this engine and create legal compliance responsibilities for your company.

Arrow Engine Company is pleased to confirm the observed emission levels for the Arrow VRG 220 and VRG 330 spark ignited engines as follows:

| Model | VRG 330TA | VRG 330HC | VRG 330/220 |
|---|---|---|---|
| $NO_x$ | 10.084 | 12.077 | 12.951 |
| CO | 1.587 | 1.314 | 1.104 |
| NMHC | .022 | .053 | .050 |

## Rated HP

VRG 330TA rated at 100 Bhp at 1800 RPM.
VRG 330HC rated at 68 Bhp at 1800 RPM.
VRG 330 rated at 68 Bhp at 1800 RPM.
VRG 220 rated at 45 Bhp at 1800 RPM.

## Brake HP Specific Fuel Rates

VRG 330TA rated at 7307 (Btu/Hp-hr).
VRG 330HC rated at 7312 (Btu/Hp-hr).
VRG 330 rated at 8038 (Btu/Hp-hr).

- Units for all values, grams/HP-hr.
- Values represent emissions at 100% loads.
- All tests based on pipeline quality Natural Gas of 900 Btu/$ft^3$ (LHV).
- Actual readings may vary based on site conditions and fuel consumption.
- Engines tested tuned for best economy.

ARROW ENGINE COMPANY - 2301 EAST INDEPENDENCE - TULSA, OKLAHOMA, USA 74110
TELEPHONE: 918-388-3236 - FAX: 918-388-3203 - EMAIL: rtrainor@arrowengine.com