

# Air Permit to Construct - New

version 1.2

(Submission #: HQD-D55Z-4RQXS, version 1)

Digitally signed by:  
CERIS-ND  
Date: 2025.06.16 18:14:00 -05:00  
Reason: Submission Data  
Location: State of North Dakota

## Details

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**Submission ID** HQD-D55Z-4RQXS

## Form Input

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### Form Instructions

#### General Process for all Pre-Construction Permitting

NOTE: At the very minimum, an application should include the following items:

1. A written description of the proposed project and the facility including site diagrams (if a physical change is proposed) and applicable process descriptions and technical specifications.
2. A summary of Hazardous Air Pollutant emissions and compliance with the Air Toxics Policy.
3. A written section addressing Title V and PSD applicability.
4. A summary of state and federal rule applicability including a listing of any New Source Performance Standards (NSPS, see 40 CFR 60) and National Emission Standards for Hazardous Air Pollutants (NESHAP, see 40 CFR 63) subparts that apply.
5. A statement addressing any dispersion modeling requirements for Criteria Pollutants or Air Toxics and the inclusion of any required modeling analysis with a complete method description in accordance with the State Air Quality Analysis Guide or Department guidance.
6. All Applicable Air Quality Permit Application forms.
7. The \$325 Permit to Construct filing fee payment per NDAC 33.1-15-23-02.  
[Additional Pre-Construction Permitting Information](#)

### Section A - Applicant Information

#### Applicant

<b>First Name</b>	<b>Last Name</b>	
Eric	Hammond	
<b>Title</b>		
Engineering Manager		
<b>Phone Type</b>	<b>Number</b>	<b>Extension</b>
Business	720-636-9688	
<b>Email</b>		
ehammond@flatironsfs.com		

### Section B - Source Information

#### Permit Application for Air Contaminant Sources

Follow link to complete form SFN 8516 and upload below. If this form is already included in your application package, please upload complete application in Section D instead of this Section.

[Link to SFN 8516 - Permit Application for Air Contaminant Sources](#)

## Upload form SFN 8516

2025.06\_Springbrook Engine Additions - SFN8516.pdf - 06/16/2025 06:05 PM

### Comment

NONE PROVIDED

## Section C - Source Location

### Facility Name

Springbrook Gas Plant

### Facility Location:

48.22972400,-103.5185580

## Section D - File Upload

### File Upload

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Select and upload applicable SFN permit forms, from the list below, to detail information provided in Section D of SFN 8516.

DO NOT ADD CONFIDENTIAL INFORMATION to this form. If you have Confidential Information see NDAC 33.1-15-14-01-16.

[NDAC 33.1-15-14-01-16](#)

**Please also remember to upload all additional documents necessary to meet Steps 1-5 of the Form Instructions Section.**

### Additional Forms

NONE PROVIDED

### Attachments

2025.06\_Springbrook Gas Plant Permit Mod - signed.pdf - 06/16/2025 06:10 PM

### Comment

NONE PROVIDED

## Springbrook Gas Plant

## Construction Permit Application

Williams County, North Dakota

June 2025

PREPARED FOR:

**1804, Ltd.**

Westminster, Colorado



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Flatirons Field Services  
10385 Westmoor Dr  
Westminster, CO 80021  
Phone: 720.291.3232

June 12, 2025

North Dakota Department of Environmental Quality  
Division of Air Quality  
4201 Normandy Street, 2<sup>nd</sup> Floor  
Bismarck, ND 58503-1324

**RE: Notification of Permit Modification – Engine Additions**  
**Springbrook Gas Plant AOP – 28416 v1.1**  
**SE ¼ SE ¼ Section 22, T155N, R100W**  
**Williams County, North Dakota**

Dear Sir / Madam,

Flatirons Field Services (Flatirons), on behalf of 1804 Ltd., would like to request a Permit Modification as detailed in the attached permit application for the Springbrook Gas Plant, AOP – 28416 V1.1. This modification request is to add two (2) Caterpillar G3516B LE rotary screw compressor engines and remove one Caterpillar G3608 A4 (C-2710) at the gas plant.

If you should have any questions I can be reached at the contact information below. If you need any additional information, or have any specific questions related to this submittal, please contact EJ Lachendro with Spirit Environmental LLC at (303) 578-2635 or [elachendro@spiritenv.com](mailto:elachendro@spiritenv.com).

Sincerely,

Eric Hammond  
Engineering Manager  
1804, Ltd.  
Office: (720) 636-9688  
[ehammond@flatironsfs.com](mailto:ehammond@flatironsfs.com)

# 1.0 Introduction

Flatirons Field Services (Flatirons), on behalf of 1804 Ltd., is submitting this application to add two (2) rotary screw Engines, 100C and 100D (Caterpillar G3516B LE) and remove one Caterpillar G3608 A4 (C-2710) at the Springbrook Gas Plant (Springbrook). Flatirons is requesting a modification to the existing Permit to Operate No. AOP-28416 v1.1 to allow for construction of two Caterpillar G3516 rotary screw compressor engines. A facility location map is presented in Figure 1 and a plot plan is presented in Figure 2 (Appendix A). Emissions calculations are presented in Appendices B; permit application forms and vendor data are presented in Appendix C.

## Modeling:

This project is not subject to the Prevention of Significant Deterioration of Air Quality (PSD) requirements. Per the NDDEQ Criteria Pollutant Modeling Requirements for a permit to Construct Memo dated October 6, 2014, projects which are not subject to the PSD rules, as a general rule, are not required to conduct emission modeling if the emissions remain below the following thresholds. The emissions at Springbrook will remain under these thresholds, and hence, emission modeling was not completed.

Pollutant	All emissions vent from stacks with height $\geq 1.5$ times nearby bldg. height	Some emissions vent from stacks with height $< 1.5$ times nearby bldg. height
Nitrogen Oxides	100 tons/year	40 tons/year
Sulfur Dioxide	100 tons/year	40 tons/year
PM <sub>10</sub>	40 tons/year	15 tons/year
PM <sub>2.5</sub>	25 tons/year	10 tons/year

## Name and address of owner and operator:

1804 Ltd.  
10385 Westmoor Dr  
Westminster, CO 80021

## Address of affected sources:

Section 22, Township 155 North, Range 100 West in Williams County

An emissions summary is presented in Table B-1. The Springbrook designations will be as follows:

- Major source of air pollutants under Title V, and
- Major source for Hazardous Air Pollutants (HAPs)
- Synthetic Minor source for criteria pollutants under Prevention of Significant Deterioration (PSD).

## 2.0 Process Description

Springbrook is a natural gas processing plant with a capacity of 70 million standard cubic feet per day. The function of the facility is to process field natural gas, produce Natural Gas Liquids (“NGLs”) and maintain pressure in the pipeline transporting treated natural gas. Equipment at the facility includes:

- 1) Three (3) inlet compressors (C-2711, C-2712, C-2713),
- 2) Five (5) refrigeration or lift gas compressors (C-300A, C-300B, C-4711, C-5701, C-5702),
- 3) Two (2) generators (GEN1 and GEN2),
- 4) Two new (2) reciprocating compressor engines (100C and 100D)
- 5) Three (3) hot oil heaters (B-940, B-941, H-951),
- 6) One (1) emergency and process flare (FL-8501),
- 7) One (1) oily water storage tanks (TK-1),
- 8) Compressor blowdown emissions (COMPBD) controlled by the Flare (FL-8501),
- 9) NGL loadout (LOAD1),
- 10) Facility pigging receiver (PIG1),
- 11) EG still vent & flash drum (T-510/V-520),
- 12) Oily water tank unloading (LOAD3),
- 13) Condensate unloading (LOAD2), and
- 14) Facility fugitive emissions (FUG).

## 3.0 Applicable Regulations

This section summarizes the applicable air quality regulations for Springbrook.

**Table 3-1 Summary of State and Federal Regulations Applicability**

Summary of State and Federal Regulations Applicability		
Program/Standard	Code	Applicability
NORTH DAKOTA AIR POLLUTION CONTROL RULES	NDAC 33.1-15	Yes
General Provisions	NDAC 33.1-15-01	Yes
Ambient Air Quality Standards	NDAC 33.1-15-02	Yes
Restriction of Emission of Visible Air Contaminants	NDAC 33.1-15-03	Yes
Open Burning Restrictions	NDAC 33.1-15-04	No
Emissions of Particulate Matter Restricted	NDAC 33.1-15-05	Yes
Emissions of Sulfur Compounds Restricted	NDAC 33.1-15-06	No
Control of Organic Compounds Emissions	NDAC 33.1-15-07	Yes
And Other Internal Combustion Engines	NDAC 33.1-15-08	Yes
Control of Pesticides	NDAC 33.1-15-10	No
Prevention of Air Pollution Emergency Episodes	NDAC 33.1-15-11	Yes
Standards of Performance for New Stationary Sources	NDAC 33.1-15-12	Yes
Emission Standards for Hazardous Air Pollutants	NDAC 33.1-15-13	Yes
Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate	NDAC 33.1-15-14	Yes
Prevention of Significant Deterioration ("PSD") of Air Quality	NDAC 33.1-15-15	No
Restriction of Odorous Air Contaminants	NDAC 33.1-15-16	Yes
Restriction of Fugitive Emissions	NDAC 33.1-15-17	Yes
Stack Heights	NDAC 33.1-15-18	Yes
Visibility Protection	NDAC 33.1-15-19	Yes
Control of Emissions from Oil and Gas Well Production Facilities	NDAC 33.1-15-20	No
Acid Rain Program	NDAC 33.1-15-21	No
Emissions Standards for HAP for Source Categories	NDAC 33.1-15-22	Yes
Fees	NDAC 33.1-15-23	Yes
Standards for Lead-Based Paint Activities	NDAC 33.1-15-24	No
Regional Haze Requirements	NDAC 33.1-15-25	Yes
National Ambient Air Quality Standards (NAAQS)	40 CFR 50	Yes
New Source Review	40 CFR 52	Yes
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (NSPS)	40 CFR 60	Yes
SUBPART A - General Provisions	40 CFR 60	Yes
SUBPART Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (60.40c-60.48c)	40 CFR 60	No

SUBPART Dc - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (60.40c-60.48c)	40 CFR 60	Yes
SUBPART Kb - Standards of Performance for Volatile Organic Liquid (VOL) Storage Vessels (Including Petroleum Liquid Storage Vessels) row which Construction, Reconstruction, or Modification Commenced after July 23, 1984 (60.110a - 60.115a)	40 CFR 60	No
SUBPART JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines	40 CFR 60	Yes
SUBPART OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.	40 CFR 60	Yes
SUBPART OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015.	40 CFR 60	Yes
SUBPART OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022.	40 CFR 60	Yes
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs) FOR SOURCE CATEGORIES	40 CFR 63	Yes
SUBPART A - General Provisions	40 CFR 63	Yes
SUBPART HH – National Emission standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities	40 CFR 63	Yes
SUBPART ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines	40 CFR 63	Yes
Title V Operating Permit	40 CFR 70	Yes
Mandatory Greenhouse Gas Reporting	40 CFR 98	Yes

### 3.1 STATE OF NORTH DAKOTA AIR QUALITY RULES

Springbrook is a “designated air contaminant source” under North Dakota Administrative Code (“NDAC”) 33.1-15-14-01; therefore, it is subject to the permitting requirements and emission limitations for new stationary source of air contaminants subject to regulation, also known as “criteria pollutants” or “regulated NSR pollutants.”

Based on the PTE of regulated NSR pollutants from Springbrook, the facility qualifies as a Major Source as defined in NDAC 33.1-15-14-06.

The remaining section details the applicability to Springbrook of the State of North Dakota Air Pollution Control Rules codified in NDAC Chapters 33.1-15-01 through 33.1-15-25.

### *General Provisions (33.1-15-01)*

The general provisions of chapter -15-01 address the following: entry onto premises, authority, variances, circumvention, severability, land use plans and zoning regulations, measurement of air contaminants, shutdown and malfunction of an installation - requirement for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Ambient Air Quality Standards (33.1-15-02)*

NDDEQ has adopted in NDAC 33.1-15-02, as mandated by North Dakota Century Code 23-25-03.2 and 23-25-03-3. Ambient Air Quality Standards affecting gas plants are equal to NAAQS under the CAA. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Restriction of Emission of Visible Air Contaminants (33.1-15-03)*

This chapter prohibits new emission sources from producing visible emissions of greater than 20% opacity, with the exception that 40% opacity is permissible for not more than one (1) six-minute period per hour. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Open Burning Restrictions (33.1-15-04)*

This chapter states that no person may cause, conduct, or permit open burning of refuse, trade waste, or other combustible material, except as provided for in section 33.1-15-04-02 or 33.1-15-10-02, and no person may conduct, cause, or permit the conduct of a salvage operation by open burning. 1804/Flatirons will not conduct open burning as outlined in this chapter and will not be subject to the provisions of this chapter.

### *Emissions of Particulate Matter Restricted (33.1-15-05)*

Section 33.1-15-05-01 regulates particulate matter from “any operation, process, or activity from which particulate matter is emitted except the burning of fuel for indirect heating in which the products of combustion do not come into direct contact with process materials.” Each of the compressor and generator engines are operated in compliance with the maximum allowable rates of emission as outlined in the provisions of this chapter. The particulate matter (“PM”) emissions of all engines and generators are less than the smallest lb/hr allowable emission rate (“E”) of Table 3 of this subpart.

Section 33.1-15-05-02 regulates particulate matter from indirect heating equipment in which “fuel, including any products or byproducts of the manufacturing process, is burned for the primary purpose of producing steam, hot water, hot air, or other indirect heating of liquids, gases, or solids and, in the course of doing so, the products of combustion do not come into direct contact with process material.” This section exempts fuel burning equipment in which gaseous fuel is burned, and as such, the heaters at Springbrook are exempted from this section since they operate on natural gas.

### *Emissions of Sulfur Compounds Restricted (33.1-15-06)*

This chapter applies to any installation in which fuel is burned, in which the SO<sub>2</sub> emissions are substantial due to the sulfur content of the fuel consumed, and in which the fuel is burned primarily to produce heat. All applicable units at the facility apply to sulfur dioxide emission limits under NSPS Subpart Dc which is listed under chapter 33.1-15-12 and, therefore, are not subject to this subpart.

### *Control of Organic Compounds Emissions (33.1-15-07)*

This chapter establishes requirements for the construction of facilities that generate organic compounds and vapors and the manner of organic compounds disposal. Springbrook will emit organic compounds and has employed a closed vent system, submerged fill pipes, and submerged fill loading at the facility. Additionally, all pumps and compressors handling organic compounds are equipped and operated with adequately maintained seals.

### *And Other Internal Combustion Engines (33.1-15-08)*

The provisions of this chapter prohibit the operation of an internal combustion engine from any source which emits “any unreasonable and excessive smoke, obnoxious or noxious gases, fumes or vapor.” 1804/Flatirons will not intentionally remove, alter or otherwise render inoperative any control device at the facility.

### *Control of Pesticides (33.1-15-10)*

The provisions of this chapter restrict the use and disposal of pesticides, surplus, and containers. 1804/Flatirons will not use pesticides and is therefore not subject to the provisions of this chapter.

### *Prevention of Air Pollution Emergency Episodes (33.1-15-11)*

When NDDEQ declares an air pollution emergency episode, 1804/Flatirons will comply with the provisions of the chapter.

### *Standards of Performance for New Stationary Sources (33.1-15-12)*

The North Dakota Standards of Performance for New Stationary Sources adopt in whole or in part the Federal NSPS regulations in 40 CFR 60. NDAC 33.1-15-12 identifies the applicable requirements of the Federal NSPS regulations adopted by the State. Springbrook is subject and complies with the following provisions of the NSPS:

- Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines.
- Subpart OOOO – New Source Performance Standards for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.

- Subpart OOOOa – New Source Performance Standards for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced September 18, 2015.

### *Emissions Standards for Hazardous Air Pollutants (33.1-15-13)*

The North Dakota Emission Standards of Hazardous Air Pollutants adopt in whole or in part the Federal NESHAPs in 40 CFR 61. NDAC 33.1-15-13 identifies the applicable requirements of the Federal NESHAP regulations adopted by the State. Springbrook is subject to MACT ZZZZ and will comply with the provisions outlined in this chapter.

### *Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate (33.1-15-14)*

Springbrook is a “designated air contaminant source” under NDAC 33.1-15-14-01; therefore, a Title V PTO for a new stationary source of air contaminants is required. Major sources are defined by Section 112 of the Federal Clean Air Act as those with Potential to Emit (“PTE”) any air contaminant subject to regulation more than 100 TPY, or any single HAP more than 10 TPY or combined HAPs more than 25 TPY.

In accordance with the allowable provisions of 33.1-15-14 and based on the PTE of regulated NSR pollutants from Springbrook, under its physical and operational design and including the effect of add-on air pollution control equipment, 1804/Flatirons has a Title V PTO for Springbrook, as required.

### *Prevention of Significant Deterioration of Air Quality (33.1-15-15)*

The North Dakota Prevention of Significant Deterioration (“PSD”) regulations adopted in whole or in part the Federal PSD regulations. NDAC 35-15-15 identifies the applicable requirements of the Federal PSD regulations adopted by the State. The provisions of the PSD program apply to Major Sources. Springbrook is not a source type included in the 26 specific facility types that are considered major stationary sources if their PTE of any regulated NSR is 100 TPY or more. Based on the estimated PTE of all regulated NSR pollutants being less than the 250 TPY threshold, Springbrook is not applicable to the PSD program.

### *Restriction of Odorous Air Contaminants (33.1-15-16)*

This chapter states “a person may not discharge into the ambient air any objectionable odorous air contaminant that measures seven (7) odor concentration units or higher outside the property boundary where the discharge is occurring.” 1804/Flatirons will be subject to the provisions of this chapter and will not emit odorous air contaminants greater than seven (7) odor concentration units at any point beyond 0.5 miles from the facility boundary.

### *Restriction of Fugitive Emissions (33.1-15-17)*

This chapter restricts fugitive emissions from any source without taking reasonable precautions to prevent such discharges from causing air pollution. 1804/Flatirons has quantified emissions from fugitive sources

at Springbrook and is complying with federal fugitive emission standards outlined in NSPS Subpart 0000/0000a.

### *Stack Heights (33.1-15-18)*

The general provisions of this chapter restrict the use of stack heights above good engineering practices (“GEP”) as well as other dispersion techniques to affect the concentration of a pollutant in the ambient air. Stack heights at Springbrook either currently meet or will meet good engineering practice standards.

### *Visibility Protection (33.1-15-19)*

New major sources as defined in Chapter 33.1-15-15 are required to demonstrate to NDDEQ that the actual emissions of visibility-impairing pollutants from the source, including fugitive emissions, will not cause or contribute to an adverse impact on visibility within any federal Class I area if such pollutants are emitted in significant quantities. Springbrook is located more than 50 miles away from any Class I area in North Dakota, and the facility complies with sections 33.1-15-12, 33.1-15-14, and 33.1-15-15. The facility will continue to maintain compliance with these rules. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Control of Emissions from Oil and Gas Well Production Facilities (33.1-15-20)*

Springbrook does not possess any gas wells, as defined in Chapter 33.1-15-20-01, and therefore does not meet the definition of a ‘gas well facility’ and is not subject to the requirements of this section.

### *Acid Rain Program (33.1-15-21)*

Springbrook is not subject to the Acid Rain Program provisions of 40 CFR Part 72-28, and consequently, not subject to the requirements of North Dakota’s Acid Rain Program.

### *Emission Standards for Hazardous Air Pollutants for Source Categories (33.1-15-22)*

The North Dakota Emission Standards for Hazardous Air Pollutants for Source Categories adopt in whole or in part the Federal MACT regulations in 40 CFR 63. NDAC 33.1-15-17 identifies the applicable requirements of the Federal MACT regulations adopted by the State. Springbrook is requesting to change from a Major source to an Area source for HAPs with this application, thereby making Springbrook not subject to any MACT requirements.

### *Fees (33.1-15-23)*

1804/Flatirons is responsible for any filing fee assessed by the NDDEQ for operation permit applications, plus any additional charges based on actual processing costs.

### *Standards for Lead-Based Paint Activities (33.1-15-24)*

Springbrook is not subject to the Lead-Based Paint provisions of 40 CFR Part 745, and consequently, is not subject to the requirements of North Dakota’s Standards for Lead-Based Paint Activities.

### *Regional Haze Requirements (33.1-15-25)*

Springbrook does not contain any equipment subject to Best Available Retrofit Technology (“BART”) and therefore not subject to the requirements of this chapter.

## 3.2 Code of Federal Regulations

### *National Ambient Air Quality Standards*

As part of the PSD analysis, major sources or modifications of air pollution are required to demonstrate compliance with NAAQS for pollutants emitted in a significant amount. Springbrook emissions of the NAAQS pollutants do not exceed PSD significance levels making further analysis unnecessary.

### *New Source Performance Standards (40 CFR 60)*

An NSPS applies to specific categories of affected facilities that are constructed, modified, or reconstructed and that meet other applicability criteria on or after a compliance date upon which a relevant subpart applies. The following sections provide a summary of NSPS applicability and emission limits for potentially affected facilities at Springbrook.

#### ***Subpart A – General Provisions***

If an individual NSPS subpart applies to a project, the general provisions of NSPS Subpart A also apply.

#### ***Subpart Db – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units***

Subpart Db applies to steam generating units that have a heat input capacity of greater than 100 MMBtu/hr. There are no steam generating units that have a heat input capacity of greater than 100 MMBtu/hr. Therefore, this subpart does not apply to Springbrook.

#### ***Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units***

Subpart Dc applies to steam generating units for which construction is commenced after June 9, 1989, and that have a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr. One (1) Hot Oil Heater is greater than or equal to the 10 MMBtu/hr design capacity and is thus applicable to NSPS Dc 60.40c(a). The Springbrook Gas Plant is complying with the provisions of the chapter demonstrated below by documenting the following:

- *Recordkeeping according to 60.48c(g)(1)-(3), (i), and*
- *Reporting according to 60.48c(a), (j)*

***Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction or Modification Commenced After July 23, 1984.***

The storage tanks at this facility are less than 75 cubic meters. Therefore, this subpart does not apply to Springbrook §60.110b(d)(4).

***Subpart JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines***

Subpart JJJJ applies to manufacturers, owners, and operators of stationary spark ignition (“SI”) internal combustion engines (“ICE”). Applicable engines are the following: engines that commence construction (ordered from the manufacturer) after June 12, 2006, and are manufactured after July 1, 2007, and are greater than or equal to 500 hp or manufactured after July 1, 2008, and are less than 500 hp, and engines that are modified or reconstructed after June 12, 2006. All internal combustion engines at Springbrook are greater than 500 hp and constructed after 2007. Springbrook is and will continue to comply with the recordkeeping/reporting/testing requirements outlined below.

- Maintain records of the hours of operation of the engines as required by §60.4245(c); and
- Conduct performance testing initially and every three years or 8,760 hours operated (whichever comes first) as required by §60.4243(a)(2)(iii)

***Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.***

Subpart OOOO applies to affected facilities that commence construction, reconstruction, or modification after August 23, 2011, and on or before September 18, 2015. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, fugitive equipment components, and sweetening units at onshore natural gas processing plants.

- *Storage Vessel Affected Facility:* The produced water tanks at this facility have less than six (6) tpy per tank emissions. Storage vessel affected facility is not applicable to Springbrook.
- *Pneumatic Controllers and Pumps Affected Facility:* All facility pneumatic controllers and pumps operate on compressed air and are not applicable to Springbrook.
- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *Fugitive Emissions Affected Facility:* The fugitive components at the Springbrook are located at an onshore natural gas processing plant, and, therefore, are subject to this subpart.

***Subpart OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015.***

Subpart OOOOa applies to affected facilities that commence construction, reconstruction, or modification after September 18, 2015. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, collection of fugitive emissions components, and sweetening units at onshore natural gas processing plants.

- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Perform maintenance as required,*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*

***Subpart OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022.***

Subpart OOOOb applies to affected facilities that commence construction, reconstruction, or modification after December 6, 2022. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, collection of fugitive emissions components, and sweetening units at onshore natural gas processing plants.

- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Perform maintenance as required,*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*
- *Collection of Fugitive Emissions Components Affected Facility:* A compressor is being installed at Springbrook, and, therefore, the collection of fugitive emissions components is an affected facility and will comply with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Conduct quarterly OGI monitoring of fugitive components affected facility*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*

## ***National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR 63)***

40 CFR 63 establishes national emission standards for source categories that emit HAPs above major source thresholds. 40 CFR 63 is also known as Maximum Achievable Control Technology (MACT) standards for Major Sources. The following sections provide a summary of MACT applicability and emission limits for potentially affected facilities at Springbrook.

### ***Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities***

Subpart HH applies to glycol dehydration units, storage vessels with the potential for flashing, and fugitive equipment at major sources of HAP emissions. The facility dehydrator meets the definition of a small glycol dehydration unit at a major source of HAPs. Springbrook is and will continue to comply with the recordkeeping/reporting requirements of this rule.

### ***Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines***

Subpart ZZZZ applies to existing, new and reconstructed engines greater than 500 hp at major sources of HAP emissions, new and reconstructed engines less than 500 hp at major sources of HAP emissions, and new or reconstructed engines at area sources of HAP emissions. This facility is a major source of HAP emissions as of September 6, 2022. Springbrook will be in full compliance with the recordkeeping/reporting/testing requirements by September 6, 2025.

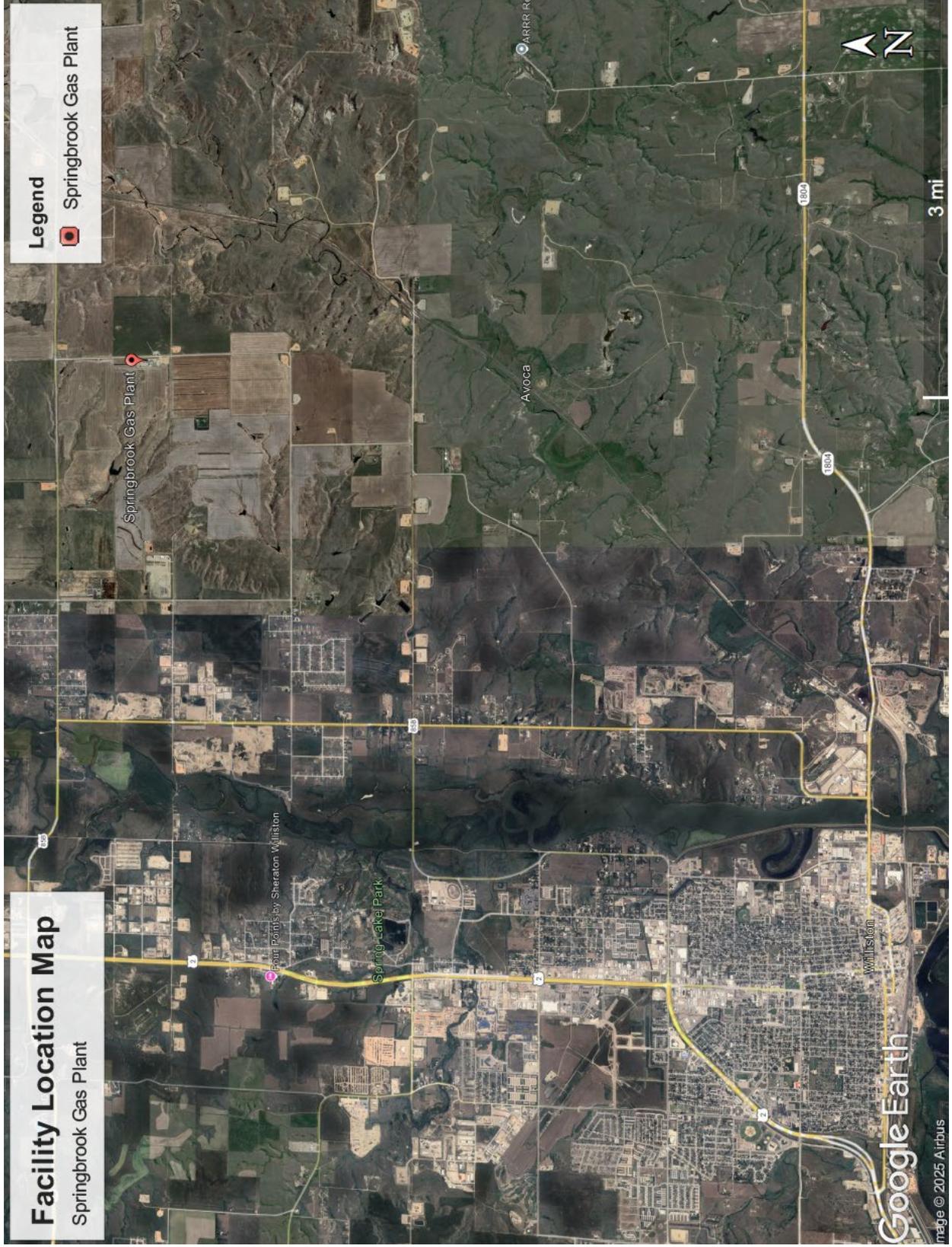
## Appendix A: Figures

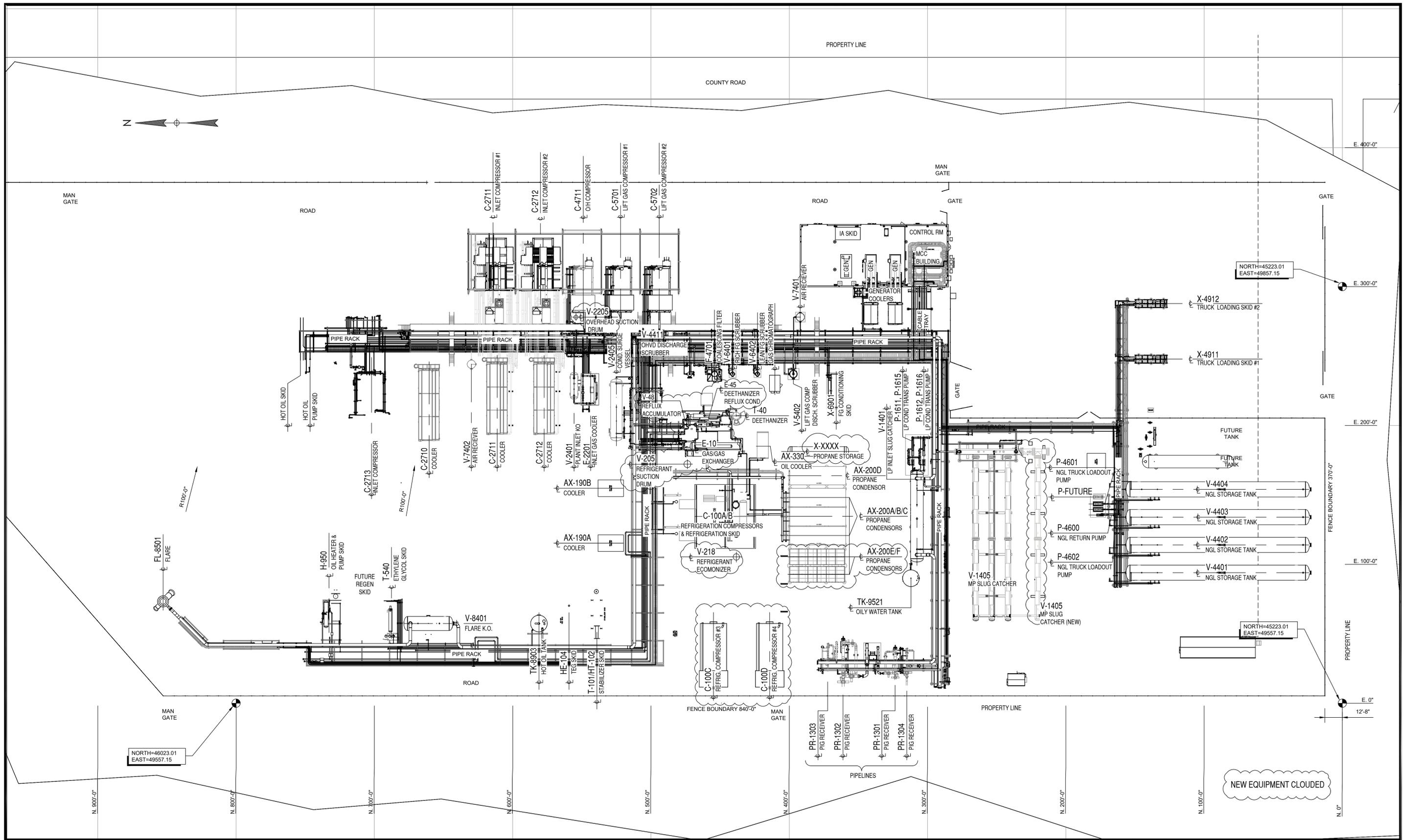
# Facility Location Map

Springbrook Gas Plant

## Legend

-  Springbrook Gas Plant





NORTH=46023.01  
EAST=49557.15

NEW EQUIPMENT CLOUDED

**NOTE:**  
 1. PLANT GRID BASED OF SURVEY INFORMATION PROVIDED K.L.J.  
 HORIZONTAL DATUM  
 NAD-83 (2011)  
 THE AZIMUTHS SHOWN ARE GRID, BASED UPON GEODETIC NORTH DERIVED FROM GPS MEASUREMENTS AT THE CENTER OF THE PROJECT ORIGIN LOCATED AT THE NE CORNER OF SECTION 22, T. 155 N., R. 100 W., 5TH P.M. LATITUDE 48°14'28.666" NORTH; LONGITUDE 103°31'04.788" WEST. AZIMUTHS REPRESENT THE CALCULATED VALUE FROM THE CENTRAL MERIDIAN USING THE FORWARD BEARING.  
 VERTICAL DATUM  
 NAVD 88  
 BASED ON ELEVATION DERIVED FROM OPUS SOLUTION ON CP\*KLJ 1 (IRON REBAR) LOCATED A DISTANCE OF 49.62' ON AN AZIMUTH OF 293°31'45" FROM THE EAST 1/4 CORNER OF SECTION 22 T.155N., R.100W., 5TH P.M. BEING AT 2125.00' ELEVATION MSL.



REFERENCE DRAWINGS	No	REVISIONS	BY	CHKD	PM	DATE
	7A	ISSUED FOR REVIEW	MCM	REH	REH	6/11/25
	6	REVISED PROPERTY LINE BOUNDARY	MCM	GH	DC	4/8/2015
	4	ADDED EQUIPMENT TAGS, REV'D NGL TANKS	KEP	BCP	DC	9/25/2014
	4	REVISED TRUCK LOADOUT	KEP	RWG	DC	7/28/2014
	4	REVISED EQUIPMENT LOCATIONS	RLG	MCM	DC	6/6/2014
	2	REVISED EQUIPMENT LAYOUT	RWG	MCM	DC	5/22/2014
	1	ADDES LOCAL COORDINATE SYSTEM	RLG	SMT	DC	5/13/2014
	0	ISSUED FOR CONSTRUCTION	RWG	MCM	DC	4/30/2014



Flatirons Field Services LLC.  
 WILLISTON NORTH DAKOTA  
 SPRINGBROOK PLANT  
 PIPING

45 MMSCFD PLOT PLAN

FILE NUMBER	DRAWING NUMBER	SCALE	REVISION
SRP-PP-3000		1"=30'-0"	7

## Appendix B: Emissions Calculations

**Table 1**  
**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Criteria Pollutant	PM <sub>10</sub> (TPY)	PM <sub>2.5</sub> (TPY)	NO <sub>x</sub> (TPY)	SO <sub>2</sub> (TPY)	CO (TPY)	VOC (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
C-2711	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.42	14.40
C-2712	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.42	14.40
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.00	4.59
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.00	4.59
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.00	4.59
C-5701	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.00	4.59
C-5702	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.00	4.59
C-2713	Compressor Engine Caterpillar G3606 A4	0.00	0.00	9.04	0.03	2.89	4.54
GEN1	Genset 1 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	3.07	5.75
GEN2	Genset 2 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	3.07	5.75
B-940	Hot Oil Heater	0.31	0.31	4.07	0.02	3.42	0.22
B-941	Hot Oil Heater	0.08	0.08	1.01	0.01	0.85	0.06
H-951	Glycol Heat Medium	0.05	0.05	0.61	0.00	0.51	0.03
TK-1	Oily Water Tank	---	---	---	---	---	5.73
FL-8501	Facility Emergency and Process Flare	---	---	39.65	0.00	180.76	36.11
LOAD1	NGL Loadout	---	---	---	---	---	1.05
LOAD2	Condensate Loadout	---	---	---	---	---	8.05
LOAD3	Oily Water Tank Loadout	---	---	---	---	---	0.32
PIG1	Pig Receiving	---	---	0.00	---	0.00	13.91
LIFTBD	Lift Compressor Blowdown	---	---	---	---	---	0.01
COMPBD	Compressor Blowdown	---	---	---	---	---	0.12
T-510/V-520	EG Still Vent and Flash Drum	---	---	---	---	---	0.14
FUG	Fugitive	---	---	---	---	---	21.95
<b>TOTAL REQUESTED</b>		1.56	1.56	150.22	0.38	217.88	164.01
Proposed modifications							

**Table 1**  
**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Hazardous Air Pollutant	HAP (TPY)	n-Hexane (TPY)	Benzene (TPY)	Toluene (TPY)	E-benzene (TPY)	Xylenes (TPY)	MeOH (TPY)	224-TMP (TPY)	Acetaldehyde (TPY)	Acrolein (TPY)	CH <sub>2</sub> O (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
C-2711	Compressor Engine Caterpillar G3608 LE	2.008	---	0.016	---	---	---	0.088	---	0.295	0.182	1.427
C-2712	Compressor Engine Caterpillar G3608 LE	2.008	---	0.016	---	---	---	0.088	---	0.295	0.182	1.427
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	1.349	---	0.007	---	---	---	0.041	---	0.138	0.085	1.078
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	1.349	---	0.007	---	---	---	0.041	---	0.138	0.085	1.078
C-5701	Lift Compressor Engine Caterpillar G3512B LE	1.349	---	0.007	---	---	---	0.041	---	0.138	0.085	1.078
C-5702	Lift Compressor Engine Caterpillar G3512B LE	1.349	---	0.007	---	---	---	0.041	---	0.138	0.085	1.078
C-2713	Compressor Engine Caterpillar G3606 A4	1.328	---	0.012	---	---	---	0.070	---	0.234	0.144	0.868
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	1.349	---	0.007	---	---	---	0.041	---	0.138	0.085	1.078
GEN1	Genset 1 Engine Caterpillar G3516B LE	1.939	---	0.012	---	---	---	0.071	---	0.237	0.146	1.473
GEN2	Genset 2 Engine Caterpillar G3516B LE	1.939	---	0.012	---	---	---	0.071	---	0.237	0.146	1.473
B-940	Hot Oil Heater	0.012	0.009	0.000	0.000	---	---	---	---	---	---	0.003
B-941	Hot Oil Heater	0.003	0.002	0.000	0.000	---	---	---	---	---	---	0.001
H-951	Glycol Heat Medium	0.002	0.001	0.000	0.000	---	---	---	---	---	---	0.000
TK-1	Oily Water Tank	1.136	0.988	0.020	0.020	0.003	0.006	---	0.100	---	---	---
FL-8501	Facility Emergency and Process Flare	0.007	0.006	0.001	0.000	0.000	0.000	---	0.000	---	---	---
LOAD1	NGL Loadout	0.018	0.016	0.001	0.001	0.000	0.000	---	---	---	---	---
LOAD2	Condensate Loadout	0.090	0.077	0.005	0.002	0.000	0.001	---	0.005	---	---	---
LOAD3	Oily Water Tank Loadout	0.072	0.000	0.059	0.011	0.002	0.000	---	0.000	---	---	---
PIG1	Pig Receiving	0.488	0.457	0.020	0.007	0.000	0.004	---	---	---	---	---
LIFTBD	Lift Compressor Blowdown	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
COMPBD	Compressor Blowdown	0.004	0.004	0.000	0.000	0.000	0.000	---	---	---	---	---
T-510/V-520	EG Still Vent and Flash Drum	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
FUG	Fugitive	0.172	0.149	0.007	0.003	0.001	0.001	---	0.004	---	---	---
<b>TOTAL REQUESTED</b>		<b>20.271</b>	<b>1.711</b>	<b>0.240</b>	<b>0.044</b>	<b>0.005</b>	<b>0.012</b>	<b>0.731</b>	<b>0.110</b>	<b>2.445</b>	<b>1.503</b>	<b>13.463</b>

Proposed modifications

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	100C	
Type	Caterpillar G3516	
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC	
Maximum Horsepower	1,340	hp
Site Rated Horsepower	1,340	hp
Annual Hours of Operation	8,760	hrs
Fuel Consumption	9,348	Btu/hp-hr      12.53 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF
Annual Fuel Consumption	101,134	Mscf      101.13 MMscf
Fuel Use Rate	11,545	scf/hr

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.118	0.500	1.476	---	6.464	0.118	0.500	1.476	---	6.464	0%
CO <sup>a, h</sup>	0.834	3.540	10.448	---	45.764	0.041	0.173	0.512	---	2.242	95.1%
VOC <sup>a, h</sup>	0.101	0.430	1.269	---	5.559	0.077	0.328	0.968	---	4.241	23.7%
Formaldehyde <sup>a, h</sup>	0.061	0.260	0.767	6,722	3.361	0.013	0.054	0.160	1,398	0.699	79.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.007	---	0.032	5.88E-04	0.002	0.007	---	0.032	0%
PM <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
PM <sub>10</sub> (filterable) <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
PM <sub>2.5</sub> (filterable) <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.035	0.105	917	0.459	8.36E-03	0.018	0.052	459	0.229	50%
Acrolein <sup>b</sup>	5.14E-03	0.022	0.064	564	0.282	5.14E-03	0.011	0.032	282	0.141	50%
Benzene <sup>b</sup>	4.40E-04	0.002	0.006	48	0.024	4.40E-04	0.001	0.003	24	0.012	50%
Methanol <sup>u</sup>	2.50E-03	0.011	0.031	274	0.137	2.50E-03	0.005	0.016	137	0.069	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mTpy)
CO <sub>2</sub>	53.02	495.63	1464.17	6413.05	1	6413.05	5817.82
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.60	3.27
CH <sub>4</sub>	0.001	0.01	0.03	0.12	25	3.02	2.74
<b>Total</b>			1,465.68			6,419.67	5823.83

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	100D	
Type	Caterpillar G3516	
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC	
Maximum Horsepower	1,340 hp	
Site Rated Horsepower	1,340 hp	
Annual Hours of Operation	8,760 hrs	
Fuel Consumption	9,348 Btu/hp-hr	12.53 MMBtu/hr
Fuel Heat Content	1,085 Btu/SCF	
Annual Fuel Consumption	101,134 Mscf	101.13 MMscf
Fuel Use Rate	11,545 scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.118	0.500	1.476	---	6.464	0.118	0.500	1.476	---	6.464	0%
CO <sup>a, h</sup>	0.834	3.540	10.448	---	45.764	0.041	0.173	0.512	---	2.242	95.1%
VOC <sup>a, h</sup>	0.101	0.430	1.269	---	5.559	0.077	0.328	0.968	---	4.241	23.7%
Formaldehyde <sup>a, h</sup>	0.061	0.260	0.767	6,722	3.361	0.013	0.054	0.160	1,398	0.699	79.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.007	---	0.032	5.88E-04	0.002	0.007	---	0.032	0%
PM <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
PM <sub>10</sub> (filterable) <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
PM <sub>2.5</sub> (filterable) <sup>b, c</sup>	9.99E-03	0.042	0.125	---	0.548	9.99E-03	0.042	0.125	---	0.548	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.035	0.105	917	0.459	8.36E-03	0.018	0.052	459	0.229	50%
Acrolein <sup>b</sup>	5.14E-03	0.022	0.064	564	0.282	5.14E-03	0.011	0.032	282	0.141	50%
Benzene <sup>b</sup>	4.40E-04	0.002	0.006	48	0.024	4.40E-04	0.001	0.003	24	0.012	50%
Methanol <sup>u</sup>	2.50E-03	0.011	0.031	274	0.137	2.50E-03	0.005	0.016	137	0.069	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mTpy)
CO <sub>2</sub>	53.02	495.63	1464.17	6413.05	1	6413.05	5817.82
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.60	3.27
CH <sub>4</sub>	0.001	0.01	0.03	0.12	25	3.02	2.74
<b>Total</b>			1,465.68			6,419.67	5823.83

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

# Appendix C: Facility and Equipment Forms



**PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES**  
 NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8516 (9-2021)

**SECTION A - FACILITY INFORMATION**

Name of Firm or Organization 1804, Ltd.				
Applicant's Name Edward Aabak				
Title Managing Director		Telephone Number (720) 636-9691		E-mail Address eaabak@flatironsfs.com
Contact Person for Air Pollution Matters Eric Hammond				
Title Engineering Manager		Telephone Number (720) 636-9688		E-mail Address ehammond@flatironsfs.com
Mailing Address (Street & No.) 10385 Westmoor Drive, Suite 225				
City Westminster		State CO		ZIP Code 80021
Facility Name Springbrook Gas Plant				
Facility Address (Street & No.) 5621 131st Avenue				
City Williston		State ND		ZIP Code 58801
County <b>Williams</b>		Coordinates NAD 83 in Decimal Degrees (to fourth decimal degree)		
		Latitude 48.22972400	Longitude -103.51855800	
Legal Description of Facility Site				
Quarter SE	Quarter SE	Section 22	Township 155N	Range 100W
Land Area at Facility Site _____ Acres (or) _____ Sq. Ft.		MSL Elevation at Facility		

**SECTION B – GENERAL NATURE OF BUSINESS**

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Gas Processing Plant	221210	1311
Natural Gas Extraction	211130	1321

**SECTION C – GENERAL PERMIT INFORMATION**

Type of Permit? <input checked="" type="checkbox"/> Permit to Construct (PTC) <input type="checkbox"/> Permit to Operate (PTO)	
If application is for a Permit to Construct, please provide the following data:	
Planned Start Construction Date 09/2025	Planned End Construction Date 12/2025

**SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION**

Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	Permit to Construct				Minor Source Permit to Operate						
		New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
100C	Rotary Screw Compressor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100D	Rotary Screw Compressor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add additional pages if necessary

**SECTION D2 – APPLICABLE REGULATIONS**

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	See attached

**SECTION E – TOTAL POTENTIAL EMISSIONS**

Pollutant	Amount (Tons Per Year)
NO <sub>x</sub>	150.2
CO	217.9
PM	1.56

Pollutant	Amount (Tons Per Year)
PM <sub>10</sub> (filterable and condensable)	1.56
PM <sub>2.5</sub> (filterable and condensable)	1.56
SO <sub>2</sub>	0.38
VOC	164.0
GHG (as CO <sub>2</sub> e)	143,452
Largest Single HAP	13.46
Total HAPS	20.27

\*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

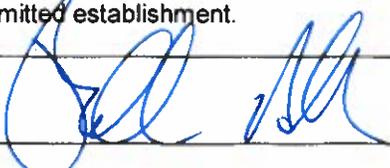
**SECTION F1 – ADDITIONAL FORMS**

Indicate which of the following forms are attached and made part of the application	
<input checked="" type="checkbox"/> Air Pollution Control Equipment (SFN 8532) <input type="checkbox"/> Construct/Operate Incinerators (SFN 8522) <input type="checkbox"/> Natural Gas Processing Plants (SFN 11408) <input type="checkbox"/> Glycol Dehydration Units (SFN 58923) <input type="checkbox"/> Flares (SFN 59652) <input type="checkbox"/> Grain, Feed, and Fertilizer Operations (SFN 8524)	<input type="checkbox"/> Fuel Burning Equipment Used for Indirect Heating (SFN 8518) <input type="checkbox"/> Hazardous Air Pollutant (HAP) Sources (SFN 8329) <input type="checkbox"/> Manufacturing or Processing Equipment (SFN 8520) <input type="checkbox"/> Volatile Organic Compounds Storage Tank (SFN 8535) <input checked="" type="checkbox"/> Internal Combustion Engines and Turbines (SFN 8891) <input type="checkbox"/> Oil/Gas Production Facility Registration (SFN 14334)

**SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION**

1. Process Description	4. Permit Application Forms
2. Facility Emission Summary	5. Emission Calculations
3. Regulatory Review Summary	6.

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature 	Date 4/16/25
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# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
--	--

## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-100C		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: Rotary Screw Compressor Engine	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3516	Date of Manufacture 04/04/2006	
Reciprocating Internal Combustion Engine			
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn	
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn	
Maximum Rating (BHP @ rpm) 1,340 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,340 bhp @ 1,400 rpm		
Engine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart IIII			
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ			
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ			
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)			
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)			
Turbine			
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency
Turbine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK			

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 101.13	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number 100C	Stack Height Above Ground Level (feet) 20.8		
Stack Diameter (feet at top) 1.33	Gas Discharged (SCFM) 9,477	Exit Temp (°F) 971	Gas Velocity (FPS) 113.1

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Complete and attach form SFN 8532
--

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.48	6.46	Manufacturer Specifications
CO	0.51	2.24	Manufacturer Specifications
PM	0.13	0.55	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.13	0.55	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.13	0.55	AP-42 Table 3.2-2
SO <sub>2</sub>	0.007	0.032	AP-42 Table 3.2-2
VOC	0.97	4.24	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,465	6,420	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.70	Manufacturer Specifications
Total HAPS	1.07	4.69	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- **Must also include forms SFN 8516 or SFN 52858**

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-100C	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3516	Date to Be Installed 09/2025		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	95.1	50	79.2	23.7
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550-1250	971
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	3.54
	VOC	g/hp-hr	0.43
	HCHO	g/hp-hr	0.26
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
7.1 Clean			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-100D		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: Rotary Screw Compressor Engine	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3516	Date of Manufacture 04/06/2006	
Reciprocating Internal Combustion Engine			
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn	
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn	
Maximum Rating (BHP @ rpm) 1,340 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,340 bhp @ 1,400 rpm		
Engine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart IIII			
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ			
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ			
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)			
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)			
Turbine			
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency
Turbine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK			

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 101.13	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number 100D		Stack Height Above Ground Level (feet) 20.8		
Stack Diameter (feet at top) 1.33	Gas Discharged (SCFM) 9,477	Exit Temp (°F) 971	Gas Velocity (FPS) 113.1	

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Complete and attach form SFN 8532
--

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.48	6.46	Manufacturer Specifications
CO	0.51	2.24	Manufacturer Specifications
PM	0.13	0.55	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.13	0.55	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.13	0.55	AP-42 Table 3.2-2
SO <sub>2</sub>	0.007	0.032	AP-42 Table 3.2-2
VOC	0.97	4.24	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,465	6,420	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.70	Manufacturer Specifications
Total HAPS	1.07	4.69	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

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 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-100D	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3516	Date to Be Installed 09/2025		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	95.1	50	79.2	23.7
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550-1250	971
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	3.54
	VOC	g/hp-hr	0.43
	HCHO	g/hp-hr	0.26
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O) 7.1 Clean			

GAS COMPRESSION APPLICATION

ENGINE SPEED (rpm):	1400	RATING STRATEGY:	LOW NOX UPGRADE
COMPRESSION RATIO:	8	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	HPG IMPCO
AFTERCOOLER - STAGE 1/STAGE 2 INLET (°F):	201 / 130		WITH AIR FUEL RATIO CONTROL
JACKET WATER OUTLET (°F):	210	<b>SITE CONDITIONS:</b>	
ASPIRATION:	TA	FUEL:	flatirons fed - Lean Fuel 6901 Run 5
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL PRESSURE RANGE(psig): (See note 1)	40.0-45.0
CONTROL SYSTEM:	ADEM3	FUEL METHANE NUMBER:	71.1
EXHAUST MANIFOLD:	ASWC	FUEL LHV (Btu/scf):	967
COMBUSTION:	LOW EMISSION	ALTITUDE(ft):	2500
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1340 bhp@1400rpm
SET POINT TIMING:	30		

RATING	NOTES	LOAD	MAX RATING			
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(2)	bhp	1340	1340	1005	670
INLET AIR TEMPERATURE		°F	100	100	100	100

ENGINE DATA							
FUEL CONSUMPTION (LHV)	(3)	Btu/bhp-hr	8450	8450	8804	9157	
FUEL CONSUMPTION (HHV)	(3)	Btu/bhp-hr	9348	9348	9739	10129	
AIR FLOW (@inlet air temp, 14.7 psia)	(4)(5)	ft3/min	3433	3433	2664	1793	(WET)
AIR FLOW	(4)(5)	lb/hr	14595	14595	11328	7625	(WET)
FUEL FLOW (60°F, 14.7 psia)		scfm	195	195	152	106	
INLET MANIFOLD PRESSURE	(6)	psi(abs)	37.6	37.6	30.7	21.1	
EXHAUST TEMPERATURE - ENGINE OUTLET	(7)	°F	971	971	976	977	
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(5)(8)	ft3/min	9477	9477	7384	4984	(WET)
EXHAUST GAS MASS FLOW	(5)(8)	lb/hr	15174	15174	11780	7939	(WET)

EMISSIONS DATA - EXHAUST OUT							
NOx (as NO2)	(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50	
CO	(9)(10)	g/bhp-hr	3.54	3.54	3.57	3.48	
NMHC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	1.11	1.11	1.22	1.28	
NMNEHC (VOCs) (mol. wt. of 15.84)	(9)(10)(11)	g/bhp-hr	0.43	0.43	0.48	0.50	
HCHO (Formaldehyde)	(9)(10)	g/bhp-hr	0.26	0.26	0.51	0.54	
CH4 (mol. wt. of 16.04)	(9)(12)	g/bhp-hr	2.71	2.71	2.99	3.12	(NOMINAL)
CO2	(9)(12)	g/bhp-hr	509	509	530	552	(NOMINAL)
EXHAUST OXYGEN	(9)(13)	% DRY	8.4	8.4	8.3	7.9	(NOMINAL)

HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)	(14)	Btu/min	42734	42734	36438	28596	
HEAT REJ. TO ATMOSPHERE	(14)	Btu/min	5313	5313	4428	3543	
HEAT REJ. TO LUBE OIL (OC)	(14)	Btu/min	6373	6373	5434	4265	
HEAT REJ. TO A/C - STAGE 1 (1AC)	(14)(15)	Btu/min	12535	12535	7062	2008	
HEAT REJ. TO A/C - STAGE 2 (2AC)	(14)(15)	Btu/min	4759	4759	3726	2500	

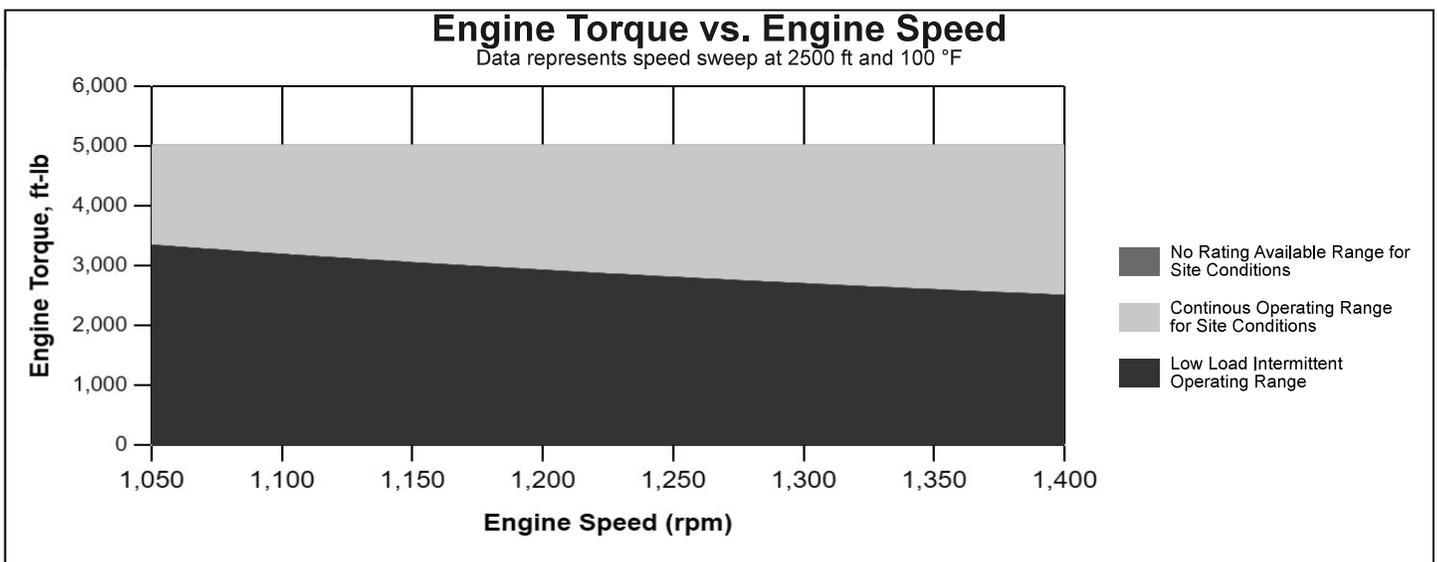
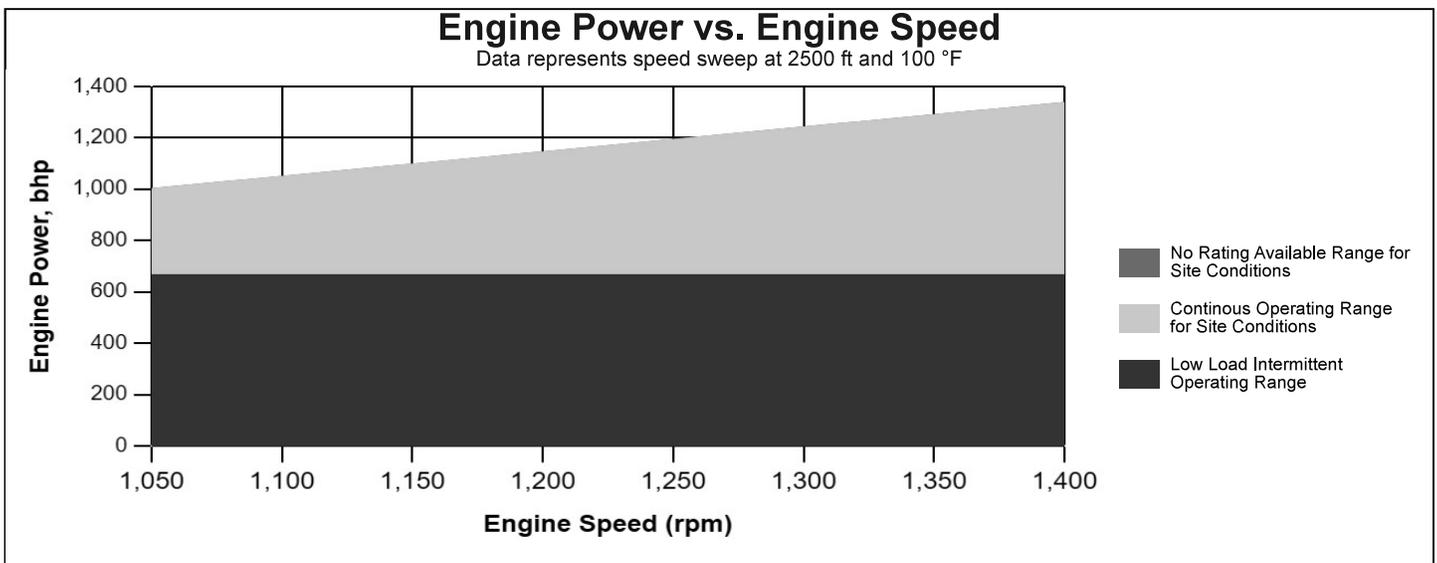
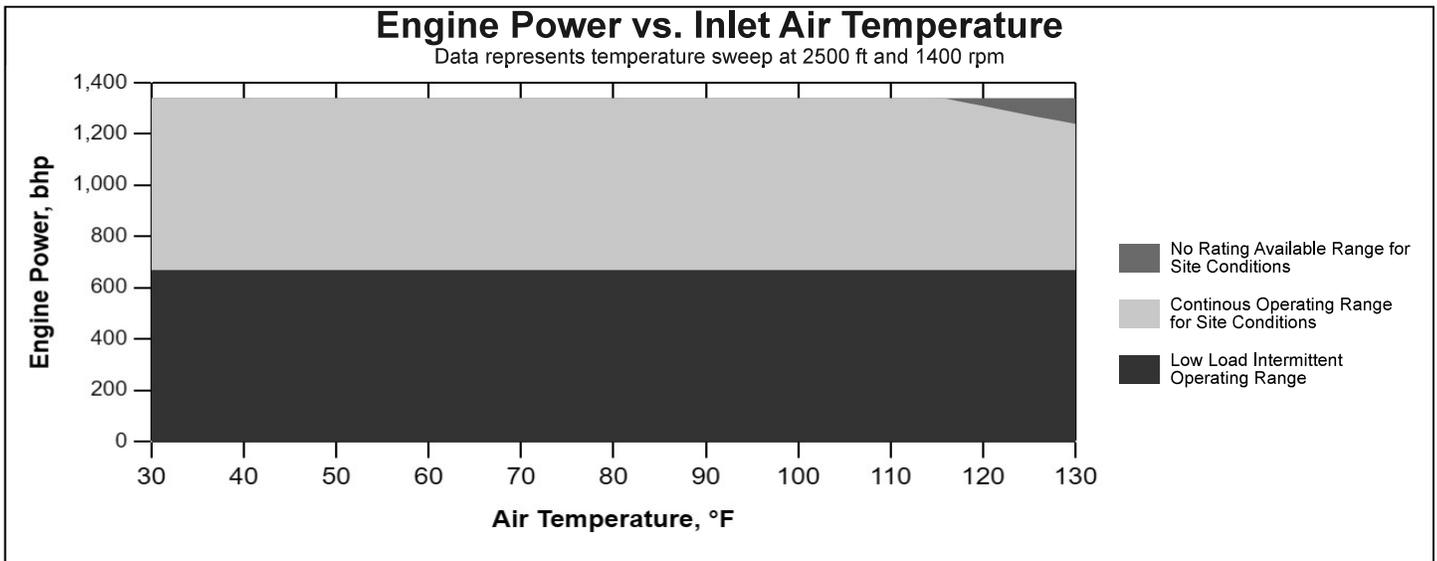
COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(15)(16)	Btu/min	67817
TOTAL AFTERCOOLER CIRCUIT (2AC)	(15)(16)	Btu/min	4997

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

**CONDITIONS AND DEFINITIONS**

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.



**Note:** At site conditions of 2500 ft and 100°F inlet air temp., constant torque can be maintained down to 1245 rpm. The minimum speed for loading at these conditions is 1050 rpm.

**NOTES:**

1. Fuel pressure range specified is to the engine fuel pressure regulator. Additional fuel train components should be considered in pressure and flow calculations.
2. Engine rating is with two engine driven water pumps. Tolerance is  $\pm 3\%$  of full load.
3. Fuel consumption tolerance is  $\pm 3.0\%$  of full load data.
4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of  $\pm 5\%$ .
5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.
6. Inlet manifold pressure is a nominal value with a tolerance of  $\pm 5\%$ .
7. Exhaust temperature is a nominal value with a tolerance of  $(+63^{\circ}\text{F}, -54^{\circ}\text{F})$ .
8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of  $\pm 6\%$ .
9. Emissions data is at engine exhaust flange prior to any after treatment.
10. CO, NMHC, NMNEHC, and HCHO emission values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than  $\pm 3$ . NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.
11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
12. CO<sub>2</sub> tolerance is  $\pm 3.0\%$ . CH<sub>4</sub> tolerance is  $\pm 26.0\%$ . Fuel methane number cannot vary more than  $\pm 3$ .
13. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NO<sub>x</sub> level. Tolerance is  $\pm 0.5$ .
14. Heat rejection values are nominal. Tolerances, based on treated water, are  $\pm 10\%$  for jacket water circuit,  $\pm 50\%$  for radiation,  $\pm 20\%$  for lube oil circuit, and  $\pm 5\%$  for aftercooler circuit.
15. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.
16. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	81.2130	81.2130
Ethane	C2H6	13.3370	13.3370
Propane	C3H8	0.4102	0.4102
Isobutane	iso-C4H10	0.0037	0.0037
Norbutane	nor-C4H10	0.0059	0.0059
Isopentane	iso-C5H12	0.0003	0.0003
Norpentane	nor-C5H12	0.0004	0.0004
Hexane	C6H14	0.0015	0.0015
Heptane	C7H16	0.0033	0.0033
Nitrogen	N2	3.8614	3.8614
Carbon Dioxide	CO2	1.1588	1.1588
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0031	0.0031
Nonane	C9H20	0.0014	0.0014
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup: flatirons fed - Lean Fuel 6901 Run 5  
Unit of Measure: English

**Calculated Fuel Properties:**

Caterpillar Methane Number:	71.1
Lower Heating Value (Btu/scf):	967
Higher Heating Value (Btu/scf):	1070
WOBBE Index (BTU/scfm):	1200
THC: Free Inert Ratio:	18.92
Total % Inerts (% N2,CO2,He):	5.02%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.07
Stoich A/F Ratio (Mass/Mass):	15.49
Specific Gravity (Relative to Air):	0.650
Fuel Specific Heat Ratio (K):	1.299

**CONDITIONS AND DEFINITIONS**

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

**FUEL LIQUIDS**

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

## Equipment Specification

<b>Proposal Information</b>	Proposal Number: RJM-25-003973	Date: <b>5/21/2025</b>
	Project Reference: Flatirons 3516 - (2) new units TBD	

<b>Engine Information</b>	Engine Make: Caterpillar	Power Output: 1,340 bhp
	Engine Model: G3516	Exhaust Flow Rate: 15,174 lb/hr
	Rated Speed: 1400 RPM	Exhaust Temperature: 971 ° F
	Fuel Description: Natural Gas	Fuel Consumption:
	Hours Of Operation: 8760 Hours per year	O <sub>2</sub> : 8.4%
	Load: 100%	H <sub>2</sub> O: 17%
	Propane: 0.41%	

Emission Data (100% Load)	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	Emission	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	
CO	3.54	45.81	406	860	4.747	10.47	0.18	2.26	20	43	0.235	0.52	95.1%
NMNEHC*	0.43	5.56	86	182	0.577	1.27	0.33	4.24	66	139	0.44	0.97	23.7%
CH <sub>2</sub> O	0.26	3.36	28	59	0.349	0.77	0.05	0.7	6	12	0.073	0.16	79.2%

<b>Replacement Element</b>	<b><u>Oxidation System (MCC3-G4-16C3)</u></b>	
	Housing Model Number:	MCC3-G4-16C3
	Element Model Number:	APX3-OX-SQ-1550-2475-350
	Number of Catalyst Elements per Engine:	2
	Number of Spare Catalyst Tracks:	2
	Design Exhaust Flow Rate:	15,174 lb/hr
	Design Exhaust Temperature:	971° F
	Exhaust Temperature Limits**:	550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
	System Pressure Loss:	7.1 inH <sub>2</sub> O (Clean)

\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.



**PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES**  
 NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8516 (9-2021)

**SECTION A - FACILITY INFORMATION**

Name of Firm or Organization 1804, Ltd.				
Applicant's Name Edward Aabak				
Title Managing Director		Telephone Number (720) 636-9691		E-mail Address eaabak@flatironsfs.com
Contact Person for Air Pollution Matters Eric Hammond				
Title Engineering Manager		Telephone Number (720) 636-9688		E-mail Address ehammond@flatironsfs.com
Mailing Address (Street & No.) 10385 Westmoor Drive, Suite 225				
City Westminster		State CO		ZIP Code 80021
Facility Name Springbrook Gas Plant				
Facility Address (Street & No.) 5621 131st Avenue				
City Williston		State ND		ZIP Code 58801
County <b>Williams</b>		Coordinates NAD 83 in Decimal Degrees (to fourth decimal degree)		
		Latitude 48.22972400	Longitude -103.51855800	
Legal Description of Facility Site				
Quarter SE	Quarter SE	Section 22	Township 155N	Range 100W
Land Area at Facility Site _____ Acres (or) _____ Sq. Ft.		MSL Elevation at Facility		

**SECTION B – GENERAL NATURE OF BUSINESS**

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Gas Processing Plant	221210	1311
Natural Gas Extraction	211130	1321

**SECTION C – GENERAL PERMIT INFORMATION**

Type of Permit? <input checked="" type="checkbox"/> Permit to Construct (PTC) <input type="checkbox"/> Permit to Operate (PTO)	
If application is for a Permit to Construct, please provide the following data:	
Planned Start Construction Date 09/2025	Planned End Construction Date 12/2025

**SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION**

Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	Permit to Construct				Minor Source Permit to Operate						
		New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
100C	Rotary Screw Compressor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100D	Rotary Screw Compressor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add additional pages if necessary

**SECTION D2 – APPLICABLE REGULATIONS**

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	See attached

**SECTION E – TOTAL POTENTIAL EMISSIONS**

Pollutant	Amount (Tons Per Year)
NO <sub>x</sub>	150.2
CO	217.9
PM	1.56

Pollutant	Amount (Tons Per Year)
PM <sub>10</sub> (filterable and condensable)	1.56
PM <sub>2.5</sub> (filterable and condensable)	1.56
SO <sub>2</sub>	0.38
VOC	164.0
GHG (as CO <sub>2</sub> e)	143,452
Largest Single HAP	13.46
Total HAPS	20.27

\*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

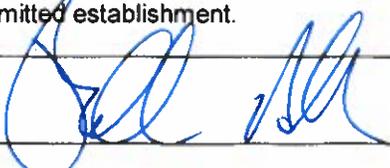
**SECTION F1 – ADDITIONAL FORMS**

Indicate which of the following forms are attached and made part of the application	
<input checked="" type="checkbox"/> Air Pollution Control Equipment (SFN 8532) <input type="checkbox"/> Construct/Operate Incinerators (SFN 8522) <input type="checkbox"/> Natural Gas Processing Plants (SFN 11408) <input type="checkbox"/> Glycol Dehydration Units (SFN 58923) <input type="checkbox"/> Flares (SFN 59652) <input type="checkbox"/> Grain, Feed, and Fertilizer Operations (SFN 8524)	<input type="checkbox"/> Fuel Burning Equipment Used for Indirect Heating (SFN 8518) <input type="checkbox"/> Hazardous Air Pollutant (HAP) Sources (SFN 8329) <input type="checkbox"/> Manufacturing or Processing Equipment (SFN 8520) <input type="checkbox"/> Volatile Organic Compounds Storage Tank (SFN 8535) <input checked="" type="checkbox"/> Internal Combustion Engines and Turbines (SFN 8891) <input type="checkbox"/> Oil/Gas Production Facility Registration (SFN 14334)

**SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION**

1. Process Description	4. Permit Application Forms
2. Facility Emission Summary	5. Emission Calculations
3. Regulatory Review Summary	6.

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature 	Date 4/16/25
---	--------------

# Air Permit to Construct - New

version 1.2

(Submission #: HQF-6AWQ-VRKMN, version 1)

Digitally signed by:  
CERIS-ND  
Date: 2025.09.11 15:44:05 -05:00  
Reason: Submission Data  
Location: State of North Dakota

## Details

---

**Submission ID** HQF-6AWQ-VRKMN

## Form Input

---

### Form Instructions

#### General Process for all Pre-Construction Permitting

NOTE: At the very minimum, an application should include the following items:

1. A written description of the proposed project and the facility including site diagrams (if a physical change is proposed) and applicable process descriptions and technical specifications.
2. A summary of Hazardous Air Pollutant emissions and compliance with the Air Toxics Policy.
3. A written section addressing Title V and PSD applicability.
4. A summary of state and federal rule applicability including a listing of any New Source Performance Standards (NSPS, see 40 CFR 60) and National Emission Standards for Hazardous Air Pollutants (NESHAP, see 40 CFR 63) subparts that apply.
5. A statement addressing any dispersion modeling requirements for Criteria Pollutants or Air Toxics and the inclusion of any required modeling analysis with a complete method description in accordance with the State Air Quality Analysis Guide or Department guidance.
6. All Applicable Air Quality Permit Application forms.
7. The \$325 Permit to Construct filing fee payment per NDAC 33.1-15-23-02.  
[Additional Pre-Construction Permitting Information](#)

### Section A - Applicant Information

#### Applicant

<b>First Name</b>	<b>Last Name</b>	
Jonathan	Hippe	
<b>Title</b>	Manager of Operations	
<b>Phone Type</b>	<b>Number</b>	<b>Extension</b>
Business	701-651-4975	
<b>Email</b>	jhippe@flatironsfs.com	

### Section B - Source Information

#### Permit Application for Air Contaminant Sources

Follow link to complete form SFN 8516 and upload below. If this form is already included in your application package, please upload complete application in Section D instead of this Section.

[Link to SFN 8516 - Permit Application for Air Contaminant Sources](#)

## Upload form SFN 8516

SFN8516.pdf - 09/11/2025 03:37 PM

### Comment

NONE PROVIDED

## Section C - Source Location

### Facility Name

Springbrook Gas Plant

### Facility Location:

48.2297,-103.5186

## Section D - File Upload

### File Upload

---

Select and upload applicable SFN permit forms, from the list below, to detail information provided in Section D of SFN 8516.

DO NOT ADD CONFIDENTIAL INFORMATION to this form. If you have Confidential Information see NDAC 33.1-15-14-01-16.

[NDAC 33.1-15-14-01-16](#)

**Please also remember to upload all additional documents necessary to meet Steps 1-5 of the Form Instructions Section.**

### Additional Forms

SFN8532 - Air Pollution Control Equipment

SFN8891 - Internal Combustion Engines and Turbines

[Link to SFN8532 - Air Pollution Control Equipment](#)

[Link to SFN8891 - Internal Combustion Engines and Turbines](#)

### Attachments

2025.09\_Springbrook Gas Plant Permit Mod - HAP Reclassification - signed.pdf - 09/11/2025 03:42 PM

### Comment

NONE PROVIDED

## Springbrook Gas Plant

### Construction Permit Application

Williams County, North Dakota

August 2025

PREPARED FOR:

**1804, Ltd.**

Westminster, Colorado



OFFICE: 281-664-2490

FAX: 281-664-2491

20465 State Highway 249, Suite 300

Houston, TX 77070

[spiritenv.com](http://spiritenv.com)

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**Flatirons Field Services**  
10385 Westmoor Dr  
Westminster, CO 80021  
Phone: 720.291.3232

September 11, 2025

North Dakota Department of Environmental Quality  
Division of Air Quality  
4201 Normandy Street, 2<sup>nd</sup> Floor  
Bismarck, ND 58503-1324

**RE: Notification of Permit Modification – Engines Modification**  
**Springbrook Gas Plant AOP – 28416 v1.1**  
**SE ¼ SE ¼ Section 22, T155N, R100W**  
**Williams County, North Dakota**

Dear Sir / Madam,

Flatirons Field Services (Flatirons), on behalf of 1804 Ltd., would like to request a Permit Modification as detailed in the attached permit application for the Springbrook Gas Plant, AOP – 28416 V1.1. This modification request is to update the catalyst information and associated formaldehyde emissions for each engine at the Springbrook Gas Plant. Per §63.1(c)(6), a major source may become an area source at any time upon reducing its emissions of and potential to emit hazardous air pollutants, as defined in this subpart, to below the major source thresholds. Flatirons would like to update the engine catalyst information to reduce the total formaldehyde emissions below the major source thresholds established in §63.2 and thereby only be subject to the area source requirements of Subparts ZZZZ and HH.

Flatirons submitted a permit modification to add two (2) Caterpillar G3516B LE rotary screw compressor engines and remove one Caterpillar G3608 A4 (C-2710) at the Springbrook Gas Plant on 6/16/2025. This permit modification is still pending.

If you should have any questions I can be reached at the contact information below. If you need any additional information, or have any specific questions related to this submittal, please contact EJ Lachendro with Spirit Environmental LLC at (303) 578-2635 or [elachendro@spiritenv.com](mailto:elachendro@spiritenv.com).

Sincerely,

*Jonathan Hippe*

Jonathan Hippe  
Manager of Operations  
1804, Ltd.  
Office: (701) 651-4975  
[jhippe@flatironsfs.com](mailto:jhippe@flatironsfs.com)

# 1.0 Introduction

Flatirons Field Services (Flatirons), on behalf of 1804 Ltd., is submitting this application to update the engine catalyst information to reduce the total formaldehyde emissions below the major source thresholds established in §63.2 at the Springbrook Gas Plant (Springbrook). Per §63.1(c)(6), a major source may become an area source at any time upon reducing its emissions of and potential to emit hazardous air pollutants, as defined in this subpart, to below the major source thresholds. Flatirons is requesting a modification to the existing Permit to Operate No. AOP-28416 v1.1. A facility location map is presented in Figure 1 and a plot plan is presented in Figure 2 (Appendix A). Emissions calculations and the engine/catalyst vendor data are presented in Appendices B; permit application forms are presented in Appendix C.

### Modeling:

This project is not subject to the Prevention of Significant Deterioration of Air Quality (PSD) requirements. Per the NDDEQ Criteria Pollutant Modeling Requirements for a permit to Construct Memo dated October 6, 2014, projects which are not subject to the PSD rules, as a general rule, are not required to conduct emission modeling if the emissions remain below the following thresholds. The emissions at Springbrook will remain under these thresholds, and hence, emission modeling was not completed.

<b>Pollutant</b>	<b>All emissions vent from stacks with height <math>\geq</math> 1.5 times nearby bldg. height</b>	<b>Some emissions vent from stacks with height <math>&lt;</math> 1.5 times nearby bldg. height</b>
Nitrogen Oxides	100 tons/year	40 tons/year
Sulfur Dioxide	100 tons/year	40 tons/year
PM <sub>10</sub>	40 tons/year	15 tons/year
PM <sub>2.5</sub>	25 tons/year	10 tons/year

### Name and address of owner and operator:

1804 Ltd.  
10385 Westmoor Dr  
Westminster, CO 80021

### Address of affected sources:

Section 22, Township 155 North, Range 100 West in Williams County

An emissions summary is presented in Table B-1. The Springbrook designations will be as follows:

- Major source of air pollutants under Title V, and
- Change from a Major source to an Area source for Hazardous Air Pollutants (HAPs)
- Synthetic Minor source for criteria pollutants under Prevention of Significant Deterioration (PSD).

## 2.0 Process Description

Springbrook is a natural gas processing plant with a capacity of 70 million standard cubic feet per day. The function of the facility is to process field natural gas, produce Natural Gas Liquids (“NGLs”) and maintain pressure in the pipeline transporting treated natural gas. Equipment at the facility includes:

- 1) Three (3) inlet compressors (C-2711, C-2712, C-2713),
- 2) Five (5) refrigeration or lift gas compressors (C-300A, C-300B, C-4711, C-5701, C-5702),
- 3) Two (2) generators (GEN1 and GEN2),
- 4) Two new (2) reciprocating compressor engines (100C and 100D)
- 5) Three (3) hot oil heaters (B-940, B-941, H-951),
- 6) One (1) emergency and process flare (FL-8501),
- 7) One (1) oily water storage tanks (TK-1),
- 8) Compressor blowdown emissions (COMPBD) controlled by the Flare (FL-8501),
- 9) NGL loadout (LOAD1),
- 10) Facility pigging receiver (PIG1),
- 11) EG still vent & flash drum (T-510/V-520),
- 12) Oily water tank unloading (LOAD3),
- 13) Condensate unloading (LOAD2), and
- 14) Facility fugitive emissions (FUG).

## 3.0 Applicable Regulations

This section summarizes the applicable air quality regulations for Springbrook.

**Table 3-1 Summary of State and Federal Regulations Applicability**

Summary of State and Federal Regulations Applicability		
Program/Standard	Code	Applicability
NORTH DAKOTA AIR POLLUTION CONTROL RULES	NDAC 33.1-15	Yes
General Provisions	NDAC 33.1-15-01	Yes
Ambient Air Quality Standards	NDAC 33.1-15-02	Yes
Restriction of Emission of Visible Air Contaminants	NDAC 33.1-15-03	Yes
Open Burning Restrictions	NDAC 33.1-15-04	No
Emissions of Particulate Matter Restricted	NDAC 33.1-15-05	Yes
Emissions of Sulfur Compounds Restricted	NDAC 33.1-15-06	No
Control of Organic Compounds Emissions	NDAC 33.1-15-07	Yes
And Other Internal Combustion Engines	NDAC 33.1-15-08	Yes
Control of Pesticides	NDAC 33.1-15-10	No
Prevention of Air Pollution Emergency Episodes	NDAC 33.1-15-11	Yes
Standards of Performance for New Stationary Sources	NDAC 33.1-15-12	Yes
Emission Standards for Hazardous Air Pollutants	NDAC 33.1-15-13	Yes
Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate	NDAC 33.1-15-14	Yes
Prevention of Significant Deterioration ("PSD") of Air Quality	NDAC 33.1-15-15	No
Restriction of Odorous Air Contaminants	NDAC 33.1-15-16	Yes
Restriction of Fugitive Emissions	NDAC 33.1-15-17	Yes
Stack Heights	NDAC 33.1-15-18	Yes
Visibility Protection	NDAC 33.1-15-19	Yes
Control of Emissions from Oil and Gas Well Production Facilities	NDAC 33.1-15-20	No
Acid Rain Program	NDAC 33.1-15-21	No
Emissions Standards for HAP for Source Categories	NDAC 33.1-15-22	Yes
Fees	NDAC 33.1-15-23	Yes
Standards for Lead-Based Paint Activities	NDAC 33.1-15-24	No
Regional Haze Requirements	NDAC 33.1-15-25	Yes
National Ambient Air Quality Standards (NAAQS)	40 CFR 50	Yes
New Source Review	40 CFR 52	Yes
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (NSPS)	40 CFR 60	Yes
SUBPART A - General Provisions	40 CFR 60	Yes
SUBPART Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (60.40c-60.48c)	40 CFR 60	No

SUBPART Dc - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (60.40c-60.48c)	40 CFR 60	Yes
SUBPART Kb - Standards of Performance for Volatile Organic Liquid (VOL) Storage Vessels (Including Petroleum Liquid Storage Vessels) row which Construction, Reconstruction, or Modification Commenced after July 23, 1984 (60.110a - 60.115a)	40 CFR 60	No
SUBPART JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines	40 CFR 60	Yes
SUBPART OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.	40 CFR 60	Yes
SUBPART OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015.	40 CFR 60	Yes
SUBPART OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022.	40 CFR 60	Yes
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs) FOR SOURCE CATEGORIES	40 CFR 63	Yes
SUBPART A - General Provisions	40 CFR 63	Yes
SUBPART HH – National Emission standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities	40 CFR 63	Yes
SUBPART ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines	40 CFR 63	Yes
Title V Operating Permit	40 CFR 70	Yes
Mandatory Greenhouse Gas Reporting	40 CFR 98	Yes

### 3.1 STATE OF NORTH DAKOTA AIR QUALITY RULES

Springbrook is a “designated air contaminant source” under North Dakota Administrative Code (“NDAC”) 33.1-15-14-01; therefore, it is subject to the permitting requirements and emission limitations for new stationary source of air contaminants subject to regulation, also known as “criteria pollutants” or “regulated NSR pollutants.”

Based on the PTE of regulated NSR pollutants from Springbrook, the facility qualifies as a Major Source as defined in NDAC 33.1-15-14-06.

The remaining section details the applicability to Springbrook of the State of North Dakota Air Pollution Control Rules codified in NDAC Chapters 33.1-15-01 through 33.1-15-25.

### *General Provisions (33.1-15-01)*

The general provisions of chapter -15-01 address the following: entry onto premises, authority, variances, circumvention, severability, land use plans and zoning regulations, measurement of air contaminants, shutdown and malfunction of an installation - requirement for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Ambient Air Quality Standards (33.1-15-02)*

NDDEQ has adopted in NDAC 33.1-15-02, as mandated by North Dakota Century Code 23-25-03.2 and 23-25-03-3. Ambient Air Quality Standards affecting gas plants are equal to NAAQS under the CAA. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Restriction of Emission of Visible Air Contaminants (33.1-15-03)*

This chapter prohibits new emission sources from producing visible emissions of greater than 20% opacity, with the exception that 40% opacity is permissible for not more than one (1) six-minute period per hour. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Open Burning Restrictions (33.1-15-04)*

This chapter states that no person may cause, conduct, or permit open burning of refuse, trade waste, or other combustible material, except as provided for in section 33.1-15-04-02 or 33.1-15-10-02, and no person may conduct, cause, or permit the conduct of a salvage operation by open burning. 1804/Flatirons will not conduct open burning as outlined in this chapter and will not be subject to the provisions of this chapter.

### *Emissions of Particulate Matter Restricted (33.1-15-05)*

Section 33.1-15-05-01 regulates particulate matter from “any operation, process, or activity from which particulate matter is emitted except the burning of fuel for indirect heating in which the products of combustion do not come into direct contact with process materials.” Each of the compressor and generator engines are operated in compliance with the maximum allowable rates of emission as outlined in the provisions of this chapter. The particulate matter (“PM”) emissions of all engines and generators are less than the smallest lb/hr allowable emission rate (“E”) of Table 3 of this subpart.

Section 33.1-15-05-02 regulates particulate matter from indirect heating equipment in which “fuel, including any products or byproducts of the manufacturing process, is burned for the primary purpose of producing steam, hot water, hot air, or other indirect heating of liquids, gases, or solids and, in the course of doing so, the products of combustion do not come into direct contact with process material.” This section exempts fuel burning equipment in which gaseous fuel is burned, and as such, the heaters at Springbrook are exempted from this section since they operate on natural gas.

### *Emissions of Sulfur Compounds Restricted (33.1-15-06)*

This chapter applies to any installation in which fuel is burned, in which the SO<sub>2</sub> emissions are substantial due to the sulfur content of the fuel consumed, and in which the fuel is burned primarily to produce heat. All applicable units at the facility apply to sulfur dioxide emission limits under NSPS Subpart Dc which is listed under chapter 33.1-15-12 and, therefore, are not subject to this subpart.

### *Control of Organic Compounds Emissions (33.1-15-07)*

This chapter establishes requirements for the construction of facilities that generate organic compounds and vapors and the manner of organic compounds disposal. Springbrook will emit organic compounds and has employed a closed vent system, submerged fill pipes, and submerged fill loading at the facility. Additionally, all pumps and compressors handling organic compounds are equipped and operated with adequately maintained seals.

### *And Other Internal Combustion Engines (33.1-15-08)*

The provisions of this chapter prohibit the operation of an internal combustion engine from any source which emits “any unreasonable and excessive smoke, obnoxious or noxious gases, fumes or vapor.” 1804/Flatirons will not intentionally remove, alter or otherwise render inoperative any control device at the facility.

### *Control of Pesticides (33.1-15-10)*

The provisions of this chapter restrict the use and disposal of pesticides, surplus, and containers. 1804/Flatirons will not use pesticides and is therefore not subject to the provisions of this chapter.

### *Prevention of Air Pollution Emergency Episodes (33.1-15-11)*

When NDDEQ declares an air pollution emergency episode, 1804/Flatirons will comply with the provisions of the chapter.

### *Standards of Performance for New Stationary Sources (33.1-15-12)*

The North Dakota Standards of Performance for New Stationary Sources adopt in whole or in part the Federal NSPS regulations in 40 CFR 60. NDAC 33.1-15-12 identifies the applicable requirements of the Federal NSPS regulations adopted by the State. Springbrook is subject and complies with the following provisions of the NSPS:

- Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines.
- Subpart OOOO – New Source Performance Standards for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.

- Subpart 0000a – New Source Performance Standards for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced September 18, 2015, and on or before December 6, 2022.
- Subpart 0000b – New Source Performance Standards for Crude Oil and Natural Gas Facilities for Which Construction, Modification or Reconstruction Commenced After December 6, 2022

### *Emissions Standards for Hazardous Air Pollutants (33.1-15-13)*

The North Dakota Emission Standards of Hazardous Air Pollutants adopt in whole or in part the Federal NESHAPs in 40 CFR 61. NDAC 33.1-15-13 identifies the applicable requirements of the Federal NESHAP regulations adopted by the State. Springbrook is subject to MACT ZZZZ and will comply with the provisions outlined in this chapter.

### *Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate (33.1-15-14)*

Springbrook is a “designated air contaminant source” under NDAC 33.1-15-14-01; therefore, a Title V PTO for a new stationary source of air contaminants is required. Major sources are defined by Section 112 of the Federal Clean Air Act as those with Potential to Emit (“PTE”) any air contaminant subject to regulation more than 100 TPY, or any single HAP more than 10 TPY or combined HAPs more than 25 TPY.

In accordance with the allowable provisions of 33.1-15-14 and based on the PTE of regulated NSR pollutants from Springbrook, under its physical and operational design and including the effect of add-on air pollution control equipment, 1804/Flatirons has a Title V PTO for Springbrook, as required.

### *Prevention of Significant Deterioration of Air Quality (33.1-15-15)*

The North Dakota Prevention of Significant Deterioration (“PSD”) regulations adopted in whole or in part the Federal PSD regulations. NDAC 35-15-15 identifies the applicable requirements of the Federal PSD regulations adopted by the State. The provisions of the PSD program apply to Major Sources. Springbrook is not a source type included in the 26 specific facility types that are considered major stationary sources if their PTE of any regulated NSR is 100 TPY or more. Based on the estimated PTE of all regulated NSR pollutants being less than the 250 TPY threshold, Springbrook is not applicable to the PSD program.

### *Restriction of Odorous Air Contaminants (33.1-15-16)*

This chapter states “a person may not discharge into the ambient air any objectionable odorous air contaminant that measures seven (7) odor concentration units or higher outside the property boundary where the discharge is occurring.” 1804/Flatirons will be subject to the provisions of this chapter and will not emit odorous air contaminants greater than seven (7) odor concentration units at any point beyond 0.5 miles from the facility boundary.

### *Restriction of Fugitive Emissions (33.1-15-17)*

This chapter restricts fugitive emissions from any source without taking reasonable precautions to prevent such discharges from causing air pollution. 1804/Flatirons has quantified emissions from fugitive sources at Springbrook and is complying with federal fugitive emission standards outlined in NSPS Subpart 0000/0000a.

### *Stack Heights (33.1-15-18)*

The general provisions of this chapter restrict the use of stack heights above good engineering practices (“GEP”) as well as other dispersion techniques to affect the concentration of a pollutant in the ambient air. Stack heights at Springbrook either currently meet or will meet good engineering practice standards.

### *Visibility Protection (33.1-15-19)*

New major sources as defined in Chapter 33.1-15-15 are required to demonstrate to NDDEQ that the actual emissions of visibility-impairing pollutants from the source, including fugitive emissions, will not cause or contribute to an adverse impact on visibility within any federal Class I area if such pollutants are emitted in significant quantities. Springbrook is located more than 50 miles away from any Class I area in North Dakota, and the facility complies with sections 33.1-15-12, 33.1-15-14, and 33.1-15-15. The facility will continue to maintain compliance with these rules. 1804/Flatirons is subject to the provisions of this chapter and follows the regulations of the section.

### *Control of Emissions from Oil and Gas Well Production Facilities (33.1-15-20)*

Springbrook does not possess any gas wells, as defined in Chapter 33.1-15-20-01, and therefore does not meet the definition of a ‘gas well facility’ and is not subject to the requirements of this section.

### *Acid Rain Program (33.1-15-21)*

Springbrook is not subject to the Acid Rain Program provisions of 40 CFR Part 72-28, and consequently, not subject to the requirements of North Dakota’s Acid Rain Program.

### *Emission Standards for Hazardous Air Pollutants for Source Categories (33.1-15-22)*

The North Dakota Emission Standards for Hazardous Air Pollutants for Source Categories adopt in whole or in part the Federal MACT regulations in 40 CFR 63. NDAC 33.1-15-17 identifies the applicable requirements of the Federal MACT regulations adopted by the State. Springbrook is requesting to change from a Major source to an Area source for HAPs with this application, thereby making Springbrook not subject to any MACT requirements.

### *Fees (33.1-15-23)*

1804/Flatirons is responsible for any filing fee assessed by the NDDEQ for operation permit applications, plus any additional charges based on actual processing costs.

### *Standards for Lead-Based Paint Activities (33.1-15-24)*

Springbrook is not subject to the Lead-Based Paint provisions of 40 CFR Part 745, and consequently, is not subject to the requirements of North Dakota's Standards for Lead-Based Paint Activities.

### *Regional Haze Requirements (33.1-15-25)*

Springbrook does not contain any equipment subject to Best Available Retrofit Technology ("BART") and therefore not subject to the requirements of this chapter.

## 3.2 Code of Federal Regulations

### *National Ambient Air Quality Standards*

As part of the PSD analysis, major sources or modifications of air pollution are required to demonstrate compliance with NAAQS for pollutants emitted in a significant amount. Springbrook emissions of the NAAQS pollutants do not exceed PSD significance levels making further analysis unnecessary.

### *New Source Performance Standards (40 CFR 60)*

An NSPS applies to specific categories of affected facilities that are constructed, modified, or reconstructed and that meet other applicability criteria on or after a compliance date upon which a relevant subpart applies. The following sections provide a summary of NSPS applicability and emission limits for potentially affected facilities at Springbrook.

#### ***Subpart A – General Provisions***

If an individual NSPS subpart applies to a project, the general provisions of NSPS Subpart A also apply.

#### ***Subpart Db – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units***

Subpart Db applies to steam generating units that have a heat input capacity of greater than 100 MMBtu/hr. There are no steam generating units that have a heat input capacity of greater than 100 MMBtu/hr. Therefore, this subpart does not apply to Springbrook.

#### ***Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units***

Subpart Dc applies to steam generating units for which construction is commenced after June 9, 1989, and that have a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr. One (1) Hot Oil Heater is greater than or equal to the 10 MMBtu/hr design capacity and is thus applicable to NSPS Dc 60.40c(a). The Springbrook Gas Plant is complying with the provisions of the chapter demonstrated below by documenting the following:

- *Recordkeeping according to 60.48c(g)(1)-(3), (i), and*
- *Reporting according to 60.48c(a), (j)*

***Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction or Modification Commenced After July 23, 1984.***

The storage tanks at this facility are less than 75 cubic meters. Therefore, this subpart does not apply to Springbrook §60.110b(d)(4).

***Subpart JJJJ – New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines***

Subpart JJJJ applies to manufacturers, owners, and operators of stationary spark ignition (“SI”) internal combustion engines (“ICE”). Applicable engines are the following: engines that commence construction (ordered from the manufacturer) after June 12, 2006, and are manufactured after July 1, 2007, and are greater than or equal to 500 hp or manufactured after July 1, 2008, and are less than 500 hp, and engines that are modified or reconstructed after June 12, 2006. All internal combustion engines at Springbrook are greater than 500 hp and constructed after 2007. Springbrook is and will continue to comply with the recordkeeping/reporting/testing requirements outlined below.

- Maintain records of the hours of operation of the engines as required by §60.4245(c); and
- Conduct performance testing initially and every three years or 8,760 hours operated (whichever comes first) as required by §60.4243(a)(2)(iii)

***Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced August 23, 2011, and on or before September 18, 2015.***

Subpart OOOO applies to affected facilities that commence construction, reconstruction, or modification after August 23, 2011, and on or before September 18, 2015. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, fugitive equipment components, and sweetening units at onshore natural gas processing plants.

- *Storage Vessel Affected Facility:* The produced water tanks at this facility have less than six (6) tpy per tank emissions. Storage vessel affected facility is not applicable to Springbrook.
- *Pneumatic Controllers and Pumps Affected Facility:* All facility pneumatic controllers and pumps operate on compressed air and are not applicable to Springbrook.
- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *Fugitive Emissions Affected Facility:* The fugitive components at the Springbrook are located at an onshore natural gas processing plant, and, therefore, are subject to this subpart.

***Subpart 0000a – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015.***

Subpart 0000a applies to affected facilities that commence construction, reconstruction, or modification after September 18, 2015. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, collection of fugitive emissions components, and sweetening units at onshore natural gas processing plants.

- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Perform maintenance as required,*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*

***Subpart 0000b – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022.***

Subpart 0000b applies to affected facilities that commence construction, reconstruction, or modification after December 6, 2022. Affected facilities include hydraulically fractured natural gas and oil wells, compressors, continuous bleed pneumatic controllers, pneumatic pumps, storage vessels, collection of fugitive emissions components, and sweetening units at onshore natural gas processing plants.

- *Centrifugal/Reciprocal Compressor Affected Facility:* All applicable centrifugal or reciprocal compressors at Springbrook are not located at a well site (as defined in this rule), and, therefore, are affected facilities in compliance with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Perform maintenance as required,*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*
- *Collection of Fugitive Emissions Components Affected Facility:* A compressor is being installed at Springbrook, and, therefore, the collection of fugitive emissions components is an affected facility and will comply with the requirements of this subpart as outlined below.
- *The following records, reports, and documents will be maintained as required:*
  - *Conduct quarterly OGI monitoring of fugitive components affected facility*
  - *Submit initial and annual reports as required, and*
  - *Maintain records as required.*

## ***National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR 63)***

40 CFR 63 establishes national emission standards for source categories that emit HAPs above major source thresholds. 40 CFR 63 is also known as Maximum Achievable Control Technology (MACT) standards for Major Sources. The following sections provide a summary of MACT applicability and emission limits for potentially affected facilities at Springbrook.

### ***Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities***

Subpart HH applies to glycol dehydration units, storage vessels with the potential for flashing, and fugitive equipment at major sources of HAP emissions and triethylene glycol dehydration units at area sources of HAP emissions. The potentially applicable unit at this facility is the facility dehydrator. The dehydrator is an ethylene glycol unit located at an area source of HAPs; therefore, the unit is not an affected source per paragraph 63.760(b)(2).

### ***Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines***

Subpart ZZZZ applies to existing, new and reconstructed engines greater than 500 hp at major sources of HAP emissions, new and reconstructed engines less than 500 hp at major sources of HAP emissions, and new or reconstructed engines at area sources of HAP emissions. This facility is an area source of HAP emissions. Compliance with Subpart ZZZZ is demonstrated by maintaining compliance with 40 CFR 60, Subpart JJJJ.

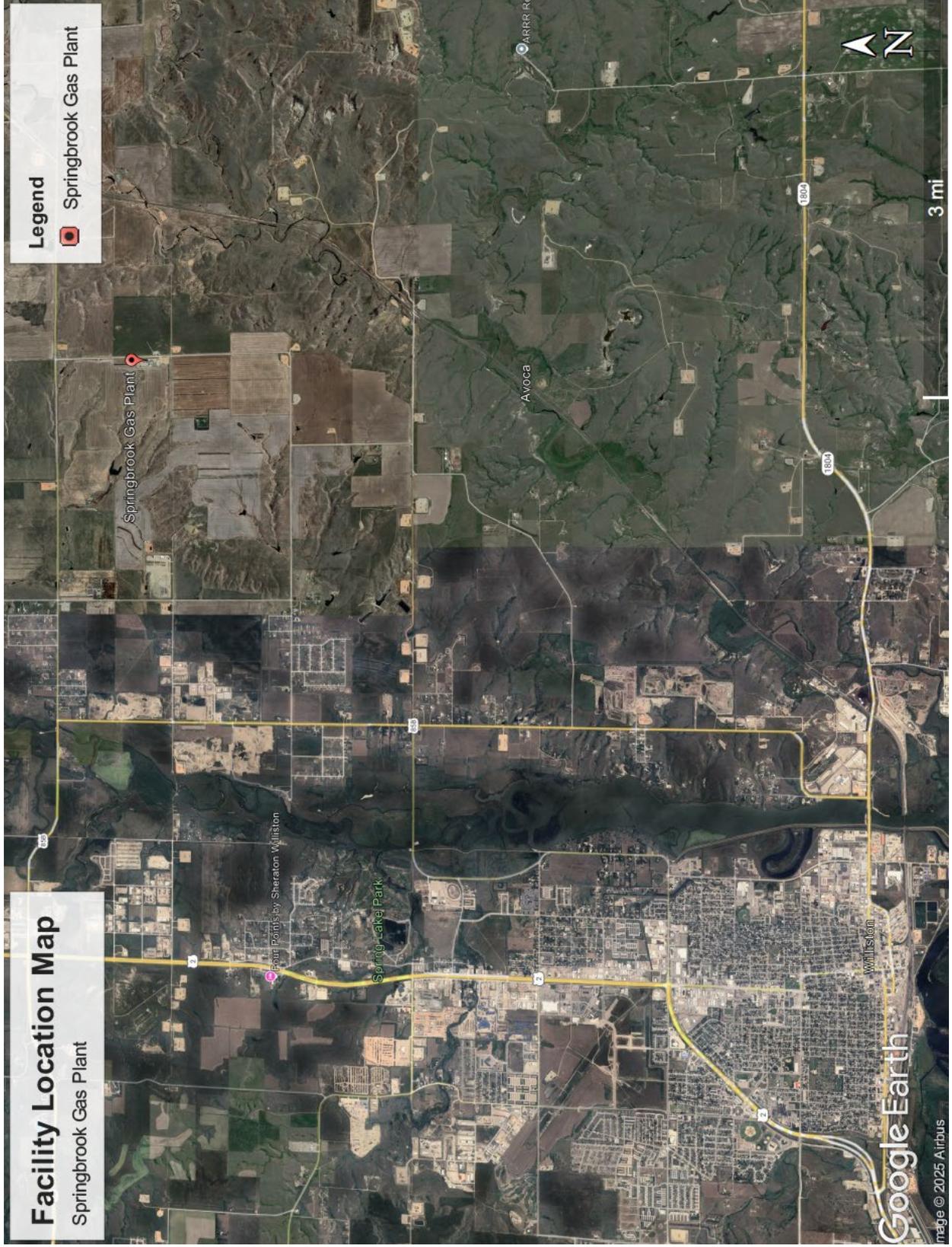
## Appendix A: Figures

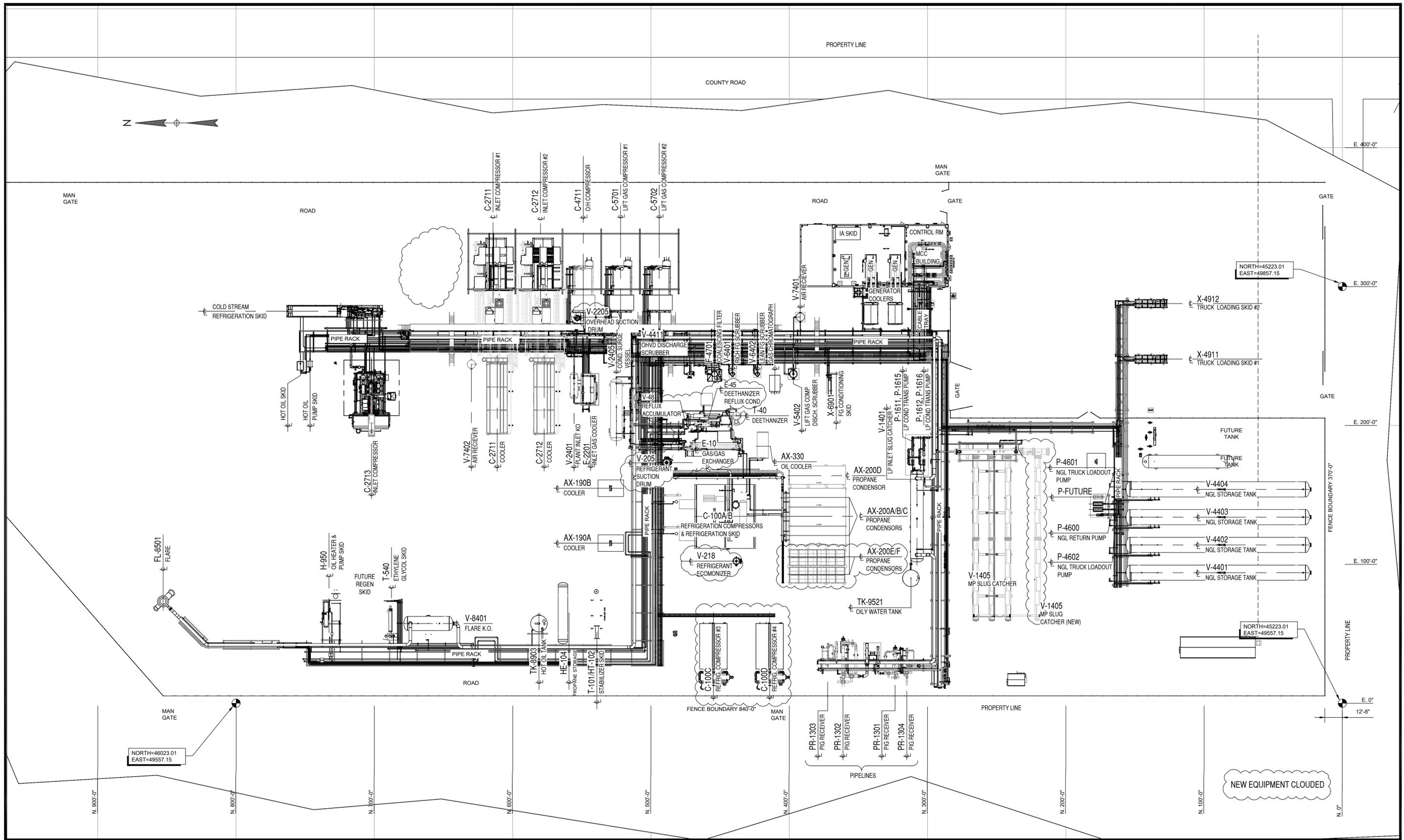
# Facility Location Map

Springbrook Gas Plant

## Legend

-  Springbrook Gas Plant





NORTH=46023.01  
EAST=49557.15

NEW EQUIPMENT CLOUDED

**NOTE:**  
 1. PLANT GRID BASED OF SURVEY INFORMATION PROVIDED K.L.J.  
**HORIZONTAL DATUM**  
 NAD-83 (2011)  
 THE AZIMUTHS SHOWN ARE GRID, BASED UPON GEODETIC NORTH DERIVED FROM GPS MEASUREMENTS AT THE CENTER OF THE PROJECT ORIGIN LOCATED AT THE NE CORNER OF SECTION 22, T. 155 N., R. 100 W., 5TH P.M. LATITUDE 48°14'28.666" NORTH; LONGITUDE 103°31'04.788" WEST. AZIMUTHS REPRESENT THE CALCULATED VALUE FROM THE CENTRAL MERIDIAN USING THE FORWARD BEARING.  
**VERTICAL DATUM**  
 NAVD 88  
 BASED ON ELEVATION DERIVED FROM OPUS SOLUTION ON CP\*KLJ 1 (IRON REBAR) LOCATED A DISTANCE OF 49.62' ON AN AZIMUTH OF 293°3'45" FROM THE EAST 1/4 CORNER OF SECTION 22 T.155N., R.100W., 5TH P.M. BEING AT 2125.00' ELEVATION MSL.

**STV | GWD**  
 621 17th St, Denver, CO | 303-951-9300

REFERENCE DRAWINGS	No	REVISIONS	BY	CHKD	PM	DATE
	7	ISSUED FOR CONSTRUCTION	MCM	REH	REH	9/10/25
	6	REVISED PROPERTY LINE BOUNDARY	MCM	GH	DC	4/8/2015
	5	ADDED EQUIPMENT TAGS, REV'D NGL TANKS	KEP	BCP	DC	9/25/2014
	4	REVISED TRUCK LOADOUT	KEP	RWG	DC	7/28/2014
	3	REVISED EQUIPMENT LOCATIONS	RLG	MCM	DC	6/6/2014
	2	REVISED EQUIPMENT LAYOUT	RWG	MCM	DC	5/22/2014
	1	ADDES LOCAL COORDINATE SYSTEM	RLG	SMT	DC	5/13/2014
	0	ISSUED FOR CONSTRUCTION	RWG	MCM	DC	4/30/2014



**Flatirons Field Services LLC.**  
 WILLISTON NORTH DAKOTA  
**SPRINGBROOK PLANT**  
 PIPING

**45 MMSCFD PLOT PLAN**

FILE NUMBER	DRAWING NUMBER	SCALE	REVISION
SRP-PP-3000		1"=30'-0"	7

## Appendix B: Emissions Calculations

**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Criteria Pollutant	PM <sub>10</sub> (TPY)	PM <sub>2.5</sub> (TPY)	NO <sub>x</sub> (TPY)	SO <sub>2</sub> (TPY)	CO (TPY)	VOC (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
C-2711	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.40	14.40
C-2712	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.40	14.40
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	1.60	2.50
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	1.60	2.50
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-5701	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-5702	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-2713	Compressor Engine Caterpillar G3606 A4	0.00	0.00	9.04	0.03	2.87	4.52
GEN1	Genset 1 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	5.75	6.84
GEN2	Genset 2 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	5.75	6.84
B-940	Hot Oil Heater	0.31	0.31	4.07	0.02	3.42	0.22
B-941	Hot Oil Heater	0.08	0.08	1.01	0.01	0.85	0.06
H-951	Glycol Heat Medium	0.09	0.09	1.21	0.01	1.02	0.07
TK-1	Oily Water Tank	---	---	---	---	---	5.73
FL-8501	Facility Emergency and Process Flare	---	---	39.65	0.00	180.76	36.11
LOAD1	NGL Loadout	---	---	---	---	---	1.05
LOAD2	Condensate Loadout	---	---	---	---	---	8.05
LOAD3	Oily Water Tank Loadout	---	---	---	---	---	0.32
PIG1	Pig Receiving	---	---	0.00	---	0.00	13.91
LIFTBD	Lift Compressor Blowdown	---	---	---	---	---	0.01
COMPBD	Compressor Blowdown	---	---	---	---	---	0.12
T-510/V-520	EG Still Vent and Flash Drum	---	---	---	---	---	0.14
FUG	Fugitive	---	---	---	---	---	21.95
<b>TOTAL REQUESTED</b>		<b>1.61</b>	<b>1.61</b>	<b>150.82</b>	<b>0.38</b>	<b>222.91</b>	<b>162.00</b>

Proposed modifications

**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Hazardous Air Pollutant	HAP (TPY)	n-Hexane (TPY)	Benzene (TPY)	Toluene (TPY)	E-benzene (TPY)	Xylenes (TPY)	MeOH (TPY)	224-TMP (TPY)	Acetaldehyde (TPY)	Acrolein (TPY)	CH <sub>2</sub> O (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
C-2711	Compressor Engine Caterpillar G3608 LE	1.282	---	0.016	---	---	---	0.088	---	0.295	0.182	0.701
C-2712	Compressor Engine Caterpillar G3608 LE	1.282	---	0.016	---	---	---	0.088	---	0.295	0.182	0.701
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	0.912	---	0.007	---	---	---	0.041	---	0.138	0.085	0.642
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	0.912	---	0.007	---	---	---	0.041	---	0.138	0.085	0.642
C-5701	Lift Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
C-5702	Lift Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
C-2713	Compressor Engine Caterpillar G3606 A4	0.959	---	0.012	---	---	---	0.070	---	0.234	0.144	0.499
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
GEN1	Genset 1 Engine Caterpillar G3516B LE	1.168	---	0.012	---	---	---	0.071	---	0.237	0.146	0.702
GEN2	Genset 2 Engine Caterpillar G3516B LE	1.168	---	0.012	---	---	---	0.071	---	0.237	0.146	0.702
B-940	Hot Oil Heater	0.012	0.009	0.000	0.000	---	---	---	---	---	---	0.003
B-941	Hot Oil Heater	0.003	0.002	0.000	0.000	---	---	---	---	---	---	0.001
H-951	Glycol Heat Medium	0.002	0.001	0.000	0.000	---	---	---	---	---	---	0.000
TK-1	Oily Water Tank	1.136	0.988	0.020	0.020	0.003	0.006	---	0.100	---	---	---
FL-8501	Facility Emergency and Process Flare	0.007	0.006	0.001	0.000	0.000	0.000	---	0.000	---	---	---
LOAD1	NGL Loadout	0.018	0.016	0.001	0.001	0.000	0.000	---	---	---	---	---
LOAD2	Condensate Loadout	0.090	0.077	0.005	0.002	0.000	0.001	---	0.005	---	---	---
LOAD3	Oily Water Tank Loadout	0.072	0.000	0.059	0.011	0.002	0.000	---	0.000	---	---	---
PIG1	Pig Receiving	0.488	0.457	0.020	0.007	0.000	0.004	---	---	---	---	---
LIFTBD	Lift Compressor Blowdown	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
COMPBD	Compressor Blowdown	0.004	0.004	0.000	0.000	0.000	0.000	---	---	---	---	---
T-510/V-520	EG Still Vent and Flash Drum	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
FUG	Fugitive	0.172	0.149	0.007	0.003	0.001	0.001	---	0.004	---	---	---
<b>TOTAL REQUESTED</b>		<b>15.048</b>	<b>1.711</b>	<b>0.240</b>	<b>0.044</b>	<b>0.005</b>	<b>0.012</b>	<b>0.731</b>	<b>0.110</b>	<b>2.445</b>	<b>1.503</b>	<b>8.240</b>

Proposed modifications

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-2711 - Inlet Compression		
Type	Caterpillar G3608		
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	2,370	hp	
Site Rated Horsepower	2,370	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	6,806	Btu/hp-hr	16.13 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	130,231	Mscf	130.23 MMscf
Fuel Use Rate	14,867	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.162	0.500	2.610	---	11.432	0.162	0.500	2.610	---	11.432	0%
CO <sup>a, h</sup>	0.890	2.750	14.356	---	62.878	0.062	0.193	1.005	---	4.401	93%
VOC <sup>a, h</sup>	0.204	0.630	3.289	---	14.405	0.204	0.630	3.289	---	14.405	0%
Formaldehyde <sup>a, h</sup>	0.084	0.260	1.357	11,890	5.945	0.010	0.031	0.160	1,403	0.701	88.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.009	---	0.042	5.88E-04	0.002	0.009	---	0.042	0%
PM <sup>b, c</sup>	9.99E-03	0.031	0.161	---	0.706	9.99E-03	0.031	0.161	---	0.706	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.005	7.71E-05	0.000	0.001	---	0.005	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.005	7.71E-05	0.000	0.001	---	0.005	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.026	0.135	1,181	0.591	8.36E-03	0.013	0.067	591	0.295	50%
Acrolein <sup>b</sup>	5.14E-03	0.016	0.083	726	0.363	5.14E-03	0.008	0.041	363	0.182	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.007	62	0.031	4.40E-04	0.001	0.004	31	0.016	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.040	353	0.177	2.50E-03	0.004	0.020	177	0.088	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	360.85	1885.42	8258.12	1	8258.12	7491.64
N <sub>2</sub> O	0.0001	0.00	0.00	0.02	298	4.64	4.21
CH <sub>4</sub>	0.001	0.01	0.04	0.16	25	3.89	3.53
<b>Total</b>			1,887.36			8,266.65	7499.38

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations  
1804, Ltd.  
Springbrook Gas Plant**

**Basis**

Unit(s)	C-2712 - Inlet Compression		
Type	Caterpillar G3608		
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	2,370	hp	
Site Rated Horsepower	2,370	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	6,806	Btu/hp-hr	16.13 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	130,231	Mscf	130.23 MMscf
Fuel Use Rate	14,867	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.162	0.500	2.610	---	11.432	0.162	0.500	2.610	---	11.432	0%
CO <sup>a, h</sup>	0.890	2.750	14.356	---	62.878	0.062	0.193	1.005	---	4.401	93%
VOC <sup>a, h</sup>	0.204	0.630	3.289	---	14.405	0.204	0.630	3.289	---	14.405	0%
Formaldehyde <sup>a, h</sup>	0.084	0.260	1.357	11,890	5.945	0.010	0.031	0.160	1,403	0.701	88.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.009	---	0.042	5.88E-04	0.002	0.009	---	0.042	0%
PM <sup>b, c</sup>	9.99E-03	0.031	0.161	---	0.706	9.99E-03	0.031	0.161	---	0.706	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.005	7.71E-05	0.000	0.001	---	0.005	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.005	7.71E-05	0.000	0.001	---	0.005	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.026	0.135	1,181	0.591	8.36E-03	0.013	0.067	591	0.295	50%
Acrolein <sup>b</sup>	5.14E-03	0.016	0.083	726	0.363	5.14E-03	0.008	0.041	363	0.182	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.007	62	0.031	4.40E-04	0.001	0.004	31	0.016	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.040	353	0.177	2.50E-03	0.004	0.020	177	0.088	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	360.85	1885.42	8258.12	1	8258.12	7491.64
N <sub>2</sub> O	0.0001	0.00	0.00	0.02	298	4.64	4.21
CH <sub>4</sub>	0.001	0.01	0.04	0.16	25	3.89	3.53
<b>Total</b>			1,887.36			8,266.65	7499.38

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-2713 - Inlet Compression		
Type	Caterpillar G3606		
Emission Control	Lean Burn Engine, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,875	hp	
Site Rated Horsepower	1,875	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	6,812	Btu/hp-hr	12.77 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	103,122	Mscf	103.12 MMscf
Fuel Use Rate	11,771.89	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.162	0.500	2.065	---	9.045	0.162	0.500	2.065	---	9.045	0%
CO <sup>a, h</sup>	0.711	2.200	9.086	---	39.796	0.051	0.158	0.654	---	2.865	92.8%
VOC <sup>a, h</sup>	0.094	0.290	1.198	---	5.246	0.081	0.250	1.032	---	4.522	13.8%
Formaldehyde <sup>a, h</sup>	0.065	0.200	0.826	7235.683	3.618	0.009	0.028	0.114	998.524	0.499	86.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.008	---	0.033	5.88E-04	0.002	0.008	---	0.033	0%
PM <sup>b, c</sup>	9.99E-03	0.031	0.128	---	0.559	9.99E-03	0.031	0.128	---	0.559	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.026	0.107	935.376	0.468	8.36E-03	0.013	0.053	467.688	0.234	50%
Acrolein <sup>b</sup>	5.14E-03	0.016	0.066	575.100	0.288	5.14E-03	0.008	0.033	287.550	0.144	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.006	49.230	0.025	4.40E-04	0.001	0.003	24.615	0.012	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.032	279.718	0.140	2.50E-03	0.004	0.016	139.859	0.070	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	361.17	1492.94	6539.08	1	6539.08	5932.15
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.68	3.33
CH <sub>4</sub>	0.001	0.01	0.03	0.12	25	3.08	2.80
<b>Total</b>			1,494.48			6,545.84	5938.29

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-300A - Refrig and Lift Gas Compressors		
Type	Caterpillar G3512B		
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,035	hp	
Site Rated Horsepower	1,035	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	7,260	Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	60,667	Mscf	60.67 MMscf
Fuel Use Rate	6,925	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.049	0.160	0.365	---	1.597	93.8%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.076	0.250	0.570	---	2.496	50.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.019	0.064	0.146	1,283	0.642	88.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			879.21			3,850.94	3493.51

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-300B - Refrig and Lift Gas Compressors	
Type	Caterpillar G3512B	
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC	
Maximum Horsepower	1,035 hp	
Site Rated Horsepower	1,035 hp	
Annual Hours of Operation	8,760 hrs	
Fuel Consumption (LHV)	7,260 Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085 Btu/SCF	
Annual Fuel Consumption	60,667 Mscf	60.67 MMscf
Fuel Use Rate	6,925 scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.049	0.160	0.365	---	1.597	93.8%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.076	0.250	0.570	---	2.496	50.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.019	0.064	0.146	1,283	0.642	88.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>d</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			<b>879.21</b>			<b>3,850.94</b>	<b>3493.51</b>

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-4711 - Refrig and Lift Gas Compressors		
Type	Caterpillar G3512B		
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,035	hp	
Site Rated Horsepower	1,035	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	7,260	Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	60,667	Mscf	60.67 MMscf
Fuel Use Rate	6,925	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.061	0.201	0.459	---	2.009	92.2%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.140	0.460	1.049	---	4.593	8.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.023	0.075	0.171	1,499	0.749	86.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			<b>879.21</b>			<b>3,850.94</b>	<b>3493.51</b>

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-5701 - Refrig and Lift Gas Compressors		
Type	Caterpillar G3512B		
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,035	hp	
Site Rated Horsepower	1,035	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	7,260	Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	60,667	Mscf	60.67 MMscf
Fuel Use Rate	6,925	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.061	0.201	0.459	---	2.009	92.2%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.140	0.460	1.049	---	4.593	8.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.023	0.075	0.171	1,499	0.749	86.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			<b>879.21</b>			<b>3,850.94</b>	<b>3493.51</b>

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-5702 - Refrig and Lift Gas Compressors		
Type	Caterpillar G3512B		
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,035	hp	
Site Rated Horsepower	1,035	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	7,260	Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	60,667	Mscf	60.67 MMscf
Fuel Use Rate	6,925	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.061	0.201	0.459	---	2.009	92.2%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.140	0.460	1.049	---	4.593	8.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.023	0.075	0.171	1,499	0.749	86.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			<b>879.21</b>			<b>3,850.94</b>	<b>3493.51</b>

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	Gen 1 - Generator Set		
Type	Caterpillar G3516B LE		
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,818	hp	
Site Rated Horsepower	1,818	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption	7,122	Btu/hp-hr	12.95 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	104,537	Mscf	104.54 MMscf
Fuel Use Rate	11,933	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.309	1.000	4.004	---	17.539	0.309	1.000	4.004	---	17.539	0%
CO <sup>a, h</sup>	0.866	2.800	11.212	---	49.110	0.101	0.328	1.312	---	5.746	88.3%
VOC <sup>a, h</sup>	0.121	0.390	1.562	---	6.840	0.121	0.390	1.562	---	6.840	0.0%
Formaldehyde <sup>a, h</sup>	0.099	0.320	1.281	11,225	5.613	0.012	0.040	0.160	1,403	0.702	87.5%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.008	---	0.033	5.88E-04	0.002	0.008	---	0.033	0%
PM <sup>b, c</sup>	9.99E-03	0.032	0.129	---	0.566	9.99E-03	0.032	0.129	---	0.566	0%
PM <sub>10</sub> (filterable) <sup>b</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
PM <sub>2.5</sub> (filterable) <sup>b</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.027	0.108	948	0.474	8.36E-03	0.014	0.054	474	0.237	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.067	583	0.291	5.14E-03	0.008	0.033	291	0.146	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.006	50	0.025	4.40E-04	0.001	0.003	25	0.012	50%
Methanol <sup>d</sup>	2.50E-03	0.008	0.032	284	0.142	2.50E-03	0.004	0.016	142	0.071	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mTpy)
CO <sub>2</sub>	53.02	377.61	1513.43	6628.83	1	6628.83	6013.57
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.73	3.38
CH <sub>4</sub>	0.001	0.01	0.03	0.13	25	3.13	2.84
<b>Total</b>			1,514.99			6,635.68	6019.79

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	Gen 2 - Generator Set		
Type	Caterpillar G3516B LE		
Emission Control	Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,818	hp	
Site Rated Horsepower	1,818	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption	7,122	Btu/hp-hr	12.95 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	104,537	Mscf	104.54 MMscf
Fuel Use Rate	11,933	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.309	1.000	4.004	---	17.539	0.309	1.000	4.004	---	17.539	0%
CO <sup>a, h</sup>	0.866	2.800	11.212	---	49.110	0.101	0.328	1.312	---	5.746	88.3%
VOC <sup>a, h</sup>	0.121	0.390	1.562	---	6.840	0.121	0.390	1.562	---	6.840	0.0%
Formaldehyde <sup>a, h</sup>	0.099	0.320	1.281	11,225	5.613	0.012	0.040	0.160	1,403	0.702	87.5%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.008	---	0.033	5.88E-04	0.002	0.008	---	0.033	0%
PM <sup>b, c</sup>	9.99E-03	0.032	0.129	---	0.566	9.99E-03	0.032	0.129	---	0.566	0%
PM <sub>10</sub> (filterable) <sup>b</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
PM <sub>2.5</sub> (filterable) <sup>b</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.027	0.108	948	0.474	8.36E-03	0.014	0.054	474	0.237	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.067	583	0.291	5.14E-03	0.008	0.033	291	0.146	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.006	50	0.025	4.40E-04	0.001	0.003	25	0.012	50%
Methanol <sup>d</sup>	2.50E-03	0.008	0.032	284	0.142	2.50E-03	0.004	0.016	142	0.071	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mTpy)
CO <sub>2</sub>	53.02	377.61	1513.43	6628.83	1	6628.83	6013.57
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.73	3.38
CH <sub>4</sub>	0.001	0.01	0.03	0.13	25	3.13	2.84
<b>Total</b>			1,514.99			6,635.68	6019.79

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

GAS COMPRESSION APPLICATION

ENGINE SPEED (rpm): 1000  
 COMPRESSION RATIO: 9:1  
 AFTERCOOLER TYPE: SCAC  
 AFTERCOOLER WATER INLET (°F): 130  
 JACKET WATER OUTLET (°F): 190  
 ASPIRATION: TA  
 COOLING SYSTEM: JW, OC+AC  
 IGNITION SYSTEM: CIS/ADEM3  
 EXHAUST MANIFOLD: DRY  
 COMBUSTION: Low Emission  
 NOx EMISSION LEVEL (g/bhp-hr NOx): 0.5

FUEL SYSTEM:

GAV  
WITH AIR FUEL RATIO CONTROL

**SITE CONDITIONS:**

FUEL: Nat Gas  
 FUEL PRESSURE RANGE(psig): 42.8-47.0  
 FUEL METHANE NUMBER: 84.8  
 FUEL LHV (Btu/scf): 905  
 ALTITUDE(ft): 500  
 MAXIMUM INLET AIR TEMPERATURE(°F): 77  
 STANDARD RATED POWER: 2370 bhp@1000rpm

RATING	NOTES	LOAD	MAXIMUM RATING			
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(1)	bhp	2370	2370	1777	1185
INLET AIR TEMPERATURE		°F	77	77	77	77

ENGINE DATA						
FUEL CONSUMPTION (LHV)		Btu/bhp-hr	6791	6791	7083	7785
FUEL CONSUMPTION (HHV)		Btu/bhp-hr	7533	7533	7856	8636
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	ft3/min	6176	6176	4771	3291
AIR FLOW	(WET)	lb/hr	27384	27384	21154	14594
FUEL FLOW (60°F, 14.7 psia)		scfm	296	296	232	170
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	75.2	75.2	57.6	40.9
EXHAUST TEMPERATURE - ENGINE OUTLET	(6)	°F	857	857	897	978
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	ft3/min	16141	16141	12850	9426
EXHAUST GAS MASS FLOW	(WET)	lb/hr	28197	28197	21790	15060

EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)	(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(8)(9)	g/bhp-hr	2.75	2.75	2.75	2.75
THC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	6.31	6.31	6.57	6.81
NMHC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	0.95	0.95	0.99	1.02
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)(10)	g/bhp-hr	0.63	0.63	0.66	0.68
HCHO (Formaldehyde)	(8)(9)	g/bhp-hr	0.26	0.26	0.28	0.31
CO2	(8)(9)	g/bhp-hr	441	441	460	506
EXHAUST OXYGEN	(8)(11)	% DRY	12.0	12.0	11.8	11.4

HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(12)	Btu/min	23910	23910	20824	17290
HEAT REJ. TO ATMOSPHERE	(12)	Btu/min	9389	9389	8813	8457
HEAT REJ. TO LUBE OIL (OC)	(12)	Btu/min	12071	12071	11541	11532
HEAT REJ. TO AFTERCOOLER (AC)	(12)(13)	Btu/min	17633	17633	8274	1670

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW)	(14)	Btu/min	26301
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(13)(14)	Btu/min	33000
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.			

**CONDITIONS AND DEFINITIONS**

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Max. rating is the maximum capability for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

## Equipment Specification

<b>Proposal Information</b>	Proposal Number: RJM-22-000783 Rev(3)	Date: <b>5/15/2025</b>
	Project Reference: Flatirons 3608 C-2711 & C-2712	

<b>Engine Information</b>	Engine Make: Caterpillar	Power Output: 2,370 bhp
	Engine Model: G3608	Exhaust Flow Rate: 28,197 lb/hr
	Rated Speed: 1000 RPM	Exhaust Temperature: 857 ° F
	Fuel Description: Natural Gas	Fuel Consumption:
	Hours Of Operation: 8760 Hours per year	O <sub>2</sub> : 12%
	Load: 100%	H <sub>2</sub> O: 15%
	Propane: 0.5%	

Emission Data (100% Load)	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	Emission	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	
CO	2.75	62.93	412	621	3.688	8.13	0.19	4.42	29	44	0.259	0.57	93%
NMNEHC*	0.63	14.42	165	248	0.845	1.86	0.63	14.42	165	248	0.845	1.86	
CH <sub>2</sub> O	0.26	5.95	36	55	0.349	0.77	0.03	0.7	4	6	0.041	0.09	88.2%

<b>Replacement Element</b>	<b>Catalyst (Replacement Catalyst)</b>
	Element Model Number: APX3-OX-SQ-1550-2475-350
	Number of Catalyst Elements per Engine: 4
	Design Exhaust Flow Rate: 28,197 lb/hr
	Design Exhaust Temperature: 857° F
	Dimensions: 15.5 in x 24.75 in
	Exhaust Temperature Limits**: 550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
	System Pressure Loss: 3.0 inH <sub>2</sub> O (Clean)

\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

ENGINE SPEED (rpm):	1000	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	7.6	APPLICATION:	GAS COMPRESSION
AFTERCOOLER TYPE:	SCAC	RATING LEVEL:	CONTINUOUS
AFTERCOOLER - STAGE 2 INLET (°F):	130	FUEL:	NAT GAS
AFTERCOOLER - STAGE 1 INLET (°F):	174	FUEL SYSTEM:	GAV
JACKET WATER OUTLET (°F):	190		WITH AIR FUEL RATIO CONTROL
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL METHANE NUMBER:	85
CONTROL SYSTEM:	ADEM4	FUEL LHV (Btu/scf):	905
EXHAUST MANIFOLD:	DRY	ALTITUDE CAPABILITY AT 100°F INLET AIR TEMP. (ft):	8265
COMBUSTION:	LOW EMISSION		
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5		

RATING	NOTES	LOAD	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(2)	bhp	1875	1406	938
ENGINE EFFICIENCY (ISO 3046/1)	(3)	%	38.3	36.8	34.0
ENGINE EFFICIENCY (NOMINAL)	(3)	%	37.4	35.9	33.2

ENGINE DATA						
FUEL CONSUMPTION (ISO 3046/1)	(4)	Btu/bhp-hr	6649	6920	7485	
FUEL CONSUMPTION (NOMINAL)	(4)	Btu/bhp-hr	6811	7089	7668	
AIR FLOW (77°F, 14.7 psia) (WET)	(5) (6)	ft <sup>3</sup> /min	4586	3474	2389	
AIR FLOW (WET)	(5) (6)	lb/hr	20336	15405	10594	
FUEL FLOW (60°F, 14.7 psia)		scfm	235	184	132	
COMPRESSOR OUT PRESSURE		in Hg(abs)	100.3	76.9	57.0	
COMPRESSOR OUT TEMPERATURE		°F	371	300	224	
AFTERCOOLER AIR OUT TEMPERATURE		°F	134	134	136	
INLET MAN. PRESSURE	(7)	in Hg(abs)	100.0	76.7	54.9	
INLET MAN. TEMPERATURE (MEASURED IN PLENUM)	(8)	°F	134	134	136	
TIMING	(9)	°BTDC	18	17	16	
EXHAUST TEMPERATURE - ENGINE OUTLET	(10)	°F	835	907	990	
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) (WET)	(11) (6)	ft <sup>3</sup> /min	11822	9468	6922	
EXHAUST GAS MASS FLOW (WET)	(11) (6)	lb/hr	20981	15908	10957	

EMISSIONS DATA - ENGINE OUT						
NOx (as NO <sub>2</sub> )	(12)(13)	g/bhp-hr	0.50	0.50	0.50	
CO	(12)(14)	g/bhp-hr	2.20	2.20	2.20	
THC (mol. wt. of 15.84)	(12)(14)	g/bhp-hr	4.61	4.82	5.09	
NMHC (mol. wt. of 15.84)	(12)(14)	g/bhp-hr	0.43	0.45	0.47	
NMNEHC (VOCs) (mol. wt. of 15.84)	(12)(14)(15)	g/bhp-hr	0.29	0.30	0.32	
HCHO (Formaldehyde)	(12)(14)	g/bhp-hr	0.20	0.21	0.24	
CO <sub>2</sub>	(12)(14)	g/bhp-hr	434	448	485	
EXHAUST OXYGEN	(12)(16)	% DRY	10.9	10.7	10.3	
LAMBDA	(12)(16)		1.99	1.93	1.84	

ENERGY BALANCE DATA						
LHV INPUT	(17)	Btu/min	212829	166119	119839	
HEAT REJECTION TO JACKET WATER (JW)	(18)(26)	Btu/min	21987	17923	14590	
HEAT REJECTION TO ATMOSPHERE	(19)	Btu/min	5575	5480	5300	
HEAT REJECTION TO LUBE OIL (OC)	(20)(27)	Btu/min	11709	10800	9347	
HEAT REJECTION TO EXHAUST (LHV TO 77°F)	(21)(22)	Btu/min	71578	59024	44095	
HEAT REJECTION TO EXHAUST (LHV TO 350°F)	(21)	Btu/min	45019	39428	31411	
HEAT REJECTION TO A/C - STAGE 1 (1AC)	(23)(26)	Btu/min	12970	6256	1714	
HEAT REJECTION TO A/C - STAGE 2 (2AC)	(24)(27)	Btu/min	6550	4051	2070	
PUMP POWER	(25)	Btu/min	2957	2957	2957	

### CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.60 in Hg barometric pressure.) No overload permitted at rating shown. Consult the altitude deration factor chart for applications that exceed the rated altitude or temperature.

Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3.

For notes information consult page three.

## Equipment Specification

<b>Proposal Information</b>	Proposal Number: RJM-22-000912 Rev(5) Project Reference: Flatirons ND 3606	Date: <b>6/9/2025</b>
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<b>Engine Information</b>	Engine Make: Caterpillar Engine Model: G3606 Rated Speed: 1000 RPM Fuel Description: Natural Gas Hours Of Operation: 8760 Hours per year Load: 100% Propane: 0.5%	Power Output: 1,875 bhp Exhaust Flow Rate: 20,981 lb/hr Exhaust Temperature: 835 ° F Fuel Consumption: O <sub>2</sub> : 10.9% H <sub>2</sub> O: 17%
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Emission Data (100% Load)	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	Emission	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	
CO	2.2	39.83	319	541	2.95	6.5	0.16	2.88	23	39	0.213	0.47	92.8%
NMNEHC*	0.29	5.25	73	125	0.389	0.86	0.25	4.53	63	107	0.335	0.74	13.8%
CH <sub>2</sub> O	0.2	3.62	27	46	0.268	0.59	0.03	0.5	4	6	0.037	0.08	86.2%

<b>Replacement Element</b>	<b><u>Catalyst (Replacement Catalyst)</u></b> Element Model Number: APX3-OX-SQ-1500-3600-350 Number of Catalyst Elements per Engine: 2 Design Exhaust Flow Rate: 20,981 lb/hr Design Exhaust Temperature: 835° F Dimensions: 15 in x 36 in Exhaust Temperature Limits**: 550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet) System Pressure Loss: 3.0 inH <sub>2</sub> O (Clean)
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\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

GAS COMPRESSION APPLICATION					
ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD		
COMPRESSION RATIO:	8	RATING LEVEL:	CONTINUOUS		
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	CAT WIDE RANGE		
AFTERCOOLER - STAGE 1/STAGE 2 INLET (°F):	201 / 149		WITH AIR FUEL RATIO CONTROL		
JACKET WATER OUTLET (°F):	203	<b>SITE CONDITIONS:</b>			
ASPIRATION:	TA	FUEL:	Gas Analysis		
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL PRESSURE RANGE(psig): (See note 1)	7.0-40.0		
CONTROL SYSTEM:	ADEM3	FUEL METHANE NUMBER:	66.3		
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	1018		
COMBUSTION:	LOW EMISSION	ALTITUDE(ft):	2799		
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1035 bhp@1400rpm		
SET POINT TIMING:	30				

RATING	NOTES	LOAD	MAX RATING			
			100%	100%	75%	54%
ENGINE POWER (WITHOUT FAN)	(2)	bhp	1006	966	724	517
INLET AIR TEMPERATURE		°F	77	99	99	99

ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	7168	7218	7578	8077
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7919	7975	8373	8923
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	2243	2254	1758	1284
AIR FLOW	(WET)	(4)(5)	lb/hr	9946	9601	7486	5471
FUEL FLOW (60°F, 14.7 psia)			scfm	118	114	90	68
INLET MANIFOLD PRESSURE		(6)	psi(abs)	43.7	42.4	34.1	25.6
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	991	991	999	1020
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(5)(8)	ft3/min	6517	6294	4938	3669
EXHAUST GAS MASS FLOW	(WET)	(5)(8)	lb/hr	10307	9949	7761	5679

EMISSIONS DATA - EXHAUST OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(9)(10)	g/bhp-hr	2.56	2.58	2.66	2.65
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	1.72	1.71	1.63	1.62
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.51	0.50	0.48	0.48
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.53	0.54	0.57	0.63
CH4 (mol. wt. of 16.04)	(NOMINAL)	(9)(12)	g/bhp-hr	2.81	2.78	2.66	2.65
CO2	(NOMINAL)	(9)(12)	g/bhp-hr	421	425	449	470
EXHAUST OXYGEN	(NOMINAL)	(9)(13)	% DRY	9.7	9.6	9.4	9.0

HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(14)	Btu/min	14639	14347	12537	12133
HEAT REJ. TO ATMOSPHERE		(14)	Btu/min	4578	4456	3731	3110
HEAT REJ. TO LUBE OIL (OC)		(14)	Btu/min	3925	3870	3509	3135
HEAT REJ. TO A/C - STAGE 1 (1AC)		(14)(15)	Btu/min	7813	7813	5301	2246
HEAT REJ. TO A/C - STAGE 2 (2AC)		(14)(15)	Btu/min	3477	3477	2628	1708

COOLING SYSTEM SIZING CRITERIA				
TOTAL JACKET WATER CIRCUIT (JW+1AC)	(15)(16)	Btu/min	24306	
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)	(15)(16)	Btu/min	8361	

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

**CONDITIONS AND DEFINITIONS**  
 Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.

## Equipment Specification

### Proposal Information

Proposal Number: RJM-25-004806 Rev(3)      Date: **8/8/2025**  
 Project Reference: Flatirons ND 3512 100/300 A&B New MCC

### Engine Information

Engine Make:	Caterpillar	Power Output:	966 bhp
Engine Model:	3512B	Exhaust Flow Rate:	9,949 lb/hr
Rated Speed:	1400 RPM	Exhaust Temperature:	991 ° F
Fuel Description:	Natural Gas	Fuel Consumption:	
Hours Of Operation:	8760 Hours per year	O <sub>2</sub> :	9.6%
Load:	100%	H <sub>2</sub> O:	17%
Propane:	1.61%		

### Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	
CO	2.58	24.07	360	689	3.46	7.63	0.16	1.49	22	43	0.215	0.47	93.8%
NMNEHC*	0.5	4.66	122	233	0.671	1.48	0.25	2.33	61	117	0.335	0.74	50%
CH <sub>2</sub> O	0.54	5.04	70	135	0.724	1.6	0.06	0.6	8	16	0.086	0.19	88.1%

### System Specifications

#### **Oxidation (MCC4-G4-12S1-25060119)**

Housing Model Number:	MCC4-G4-12S1-25060119
Element Model Number:	APX3-OX-SQ-1550-2475-350
Number of Catalyst Elements per Engine:	2
Design Exhaust Flow Rate:	10,220 lb/hr
Design Exhaust Temperature:	979° F
Exhaust Temperature Limits**:	550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
System Pressure Loss:	8 inH <sub>2</sub> O (Clean)

\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

## Equipment Specification

<b>Proposal Information</b>	Proposal Number:	RJM-21-008623 Rev(5)	Date:	<b>8/6/2025</b>
	Project Reference:	Flatirons 3512B units C4711, C5701, C5702		

<b>Engine Information</b>	Engine Make:	Caterpillar	Power Output:	966 bhp
	Engine Model:	3512B	Exhaust Flow Rate:	9,949 lb/hr
	Rated Speed:	1400 RPM	Exhaust Temperature:	991 ° F
	Fuel Description:	Natural Gas	Fuel Consumption:	
	Hours Of Operation:	8760 Hours per year	O <sub>2</sub> :	9.6%
	Load:	100%	H <sub>2</sub> O:	18%
	Propane:	1.61%		

Emission Data (100% Load)	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	Emission	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	
CO	2.58	24.07	364	698	3.46	7.63	0.2	1.87	28	54	0.268	0.59	92.2%
NMNEHC*	0.5	4.66	123	236	0.671	1.48	0.46	4.29	113	217	0.617	1.36	8%
CH <sub>2</sub> O	0.54	5.04	71	136	0.724	1.6	0.08	0.7	10	19	0.101	0.22	86.1%

<b>Replacement Element</b>	<b><u>Catalyst (Replacement Catalyst)</u></b>	
	Element Model Number:	APX3-OX-SQ-1550-2475-350
	Number of Catalyst Elements per Engine:	2
	Design Exhaust Flow Rate:	9,949 lb/hr
	Design Exhaust Temperature:	991° F
	Dimensions:	15.5 in x 24.75 in
	Exhaust Temperature Limits**:	550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
System Pressure Loss:	3.0 inH <sub>2</sub> O (Clean)	

\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

GENSET - WITHOUT RADIATOR					
ENGINE SPEED (rpm):	1800	RATING STRATEGY:	STANDARD		
COMPRESSION RATIO:	11	FUEL SYSTEM:	CAT LOW PRESSURE		
AFTERCOOLER TYPE:	SCAC		WITH AIR FUEL RATIO CONTROL		
AFTERCOOLER - STAGE 1/STAGE 2 INLET (°F):	187 / 130	<b>SITE CONDITIONS:</b>			
JACKET WATER OUTLET (°F):	198	FUEL:	Gas Analysis		
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	1.5-5.0		
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	66.3		
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1018		
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	2799		
COMBUSTION:	LOW EMISSION	STANDARD RATED POWER:	1818 bhp@1800rpm		
NOx EMISSION LEVEL (g/bhp-hr NOx):	1.0	GENERATOR / VOLTAGE / POWER FACTOR:	Default / 480-2400V / 1.0		
SET POINT TIMING:	21				

RATING	NOTES	LOAD	MAX RATING				SITE RATING AT MAX INLET AIR TEMP			
			100%	100%	75%	53%	100%	100%	75%	53%
GENSET POWER (WITHOUT FAN)	(2)(3)	ekW	1239	1239	930	653	1239	1239	930	653
GENSET POWER (WITHOUT FAN)	(2)(3)	kVA	1239	1239	930	653	1239	1239	930	653
ENGINE POWER (WITHOUT FAN)	(3)	bhp	1711	1711	1287	909	1711	1711	1287	909
INLET AIR TEMPERATURE		°F	99	99	99	99	99	99	99	99
GENERATOR EFFICIENCY	(2)	%	97.2	97.2	96.9	96.3	97.2	97.2	96.9	96.3
GENSET EFFICIENCY (ISO 3046/1)	(4)	%	35.1	35.1	33.8	31.3	35.1	35.1	33.8	31.3
THERMAL EFFICIENCY	(5)	%	51.1	51.1	52.3	54.9	51.1	51.1	52.3	54.9
TOTAL EFFICIENCY	(6)	%	86.2	86.2	86.1	86.2	86.2	86.2	86.1	86.2

ENGINE DATA							
GENSET FUEL CONSUMPTION (ISO 3046/1)	(7)	Btu/ekW-hr	9720	9720	10088	10905	
GENSET FUEL CONSUMPTION (NOMINAL)	(7)	Btu/ekW-hr	9908	9908	10284	11117	
ENGINE FUEL CONSUMPTION (NOMINAL)	(7)	Btu/bhp-hr	7178	7178	7429	7979	
AIR FLOW (@inlet air temp, 14.7 psia)	(8)	ft3/min	3805	3805	2929	2136	
AIR FLOW (WET)	(8)	lb/hr	16206	16206	12474	9097	
FUEL FLOW (60°F, 14.7 psia)		scfm	201	201	157	119	
INLET MANIFOLD PRESSURE	(9)	psi(abs)	34.5	34.5	27.2	20.1	
EXHAUST TEMPERATURE - ENGINE OUTLET	(10)	°F	995	995	1004	1028	
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(11)	ft3/min	10663	10663	8264	6139	
EXHAUST GAS MASS FLOW (WET)	(11)	lb/hr	16823	16823	12955	9462	
MAX INLET RESTRICTION	(12)	in H2O	9.56	9.56	6.86	3.61	
MAX EXHAUST RESTRICTION	(12)	in H2O	18.27	18.27	13.55	5.65	

EMISSIONS DATA - EXHAUST OUT							
NOx (as NO2) (NOMINAL)	(13)(14)	g/bhp-hr	1.00	1.00	1.00	1.00	
CO	(13)(14)	g/bhp-hr	2.80	2.80	2.88	3.33	
NMHC (mol. wt. of 15.84)	(13)(14)	g/bhp-hr	1.34	1.34	1.46	1.59	
NMNEHC (VOCs) (mol. wt. of 15.84)	(13)(14)(15)	g/bhp-hr	0.39	0.39	0.43	0.47	
HCHO (Formaldehyde)	(13)(14)	g/bhp-hr	0.32	0.32	0.35	0.39	
CH4 (mol. wt. of 16.04) (NOMINAL)	(13)(16)	g/bhp-hr	2.18	2.18	2.38	2.59	
CO2 (NOMINAL)	(13)(16)	g/bhp-hr	408	408	426	442	
EXHAUST OXYGEN (NOMINAL)	(13)(17)	% DRY	9.5	9.5	9.4	9.2	

HEAT REJECTION							
LHV INPUT	(18)	Btu/min	204672	204672	159316	120912	
HEAT REJ. TO JACKET WATER (JW)	(19)	Btu/min	31325	31325	26464	24098	
HEAT REJ. TO ATMOSPHERE (INCLUDES GENERATOR)	(19)	Btu/min	9140	9140	7636	6357	
HEAT REJ. TO LUBE OIL (OC)	(19)	Btu/min	7261	7261	6639	5966	
HEAT REJECTION TO EXHAUST (LHV TO 248°F)	(19)	Btu/min	56660	56660	44209	33431	
HEAT REJ. TO A/C - STAGE 1 (1AC)	(19)(21)	Btu/min	6642	6642	3683	1030	
HEAT REJ. TO A/C - STAGE 2 (2AC)	(19)(21)	Btu/min	6144	6144	4285	2625	
PUMP POWER	(20)	Btu/min	977	977	977	977	

COOLING SYSTEM SIZING CRITERIA					
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(22)	Btu/min	53327	53327	
TOTAL AFTERCOOLER CIRCUIT (2AC)	(22)	Btu/min	7434	7434	
HEAT REJECTION TO EXHAUST (LHV TO 248°F)	(22)	Btu/min	62326	62326	

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

MINIMUM HEAT RECOVERY					
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(23)	Btu/min	40311	40311	
TOTAL AFTERCOOLER CIRCUIT (2AC)	(23)	Btu/min	5837	5837	
HEAT REJECTION TO EXHAUST (LHV TO 248°F)	(23)	Btu/min	47229	47229	

**CONDITIONS AND DEFINITIONS**  
 Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.

## Equipment Specification

<b>Proposal Information</b>	Proposal Number: RJM-22-000804 Rev(4)	Date: <b>8/21/2025</b>
	Project Reference: Flatirons 3516B Gen 1 & Gen 2	

<b>Engine Information</b>	Engine Make: Caterpillar	Power Output: 1,818 bhp
	Engine Model: 3516B	Exhaust Flow Rate: 16,823 lb/hr
	Rated Speed: 1800 RPM	Exhaust Temperature: 995 ° F
	Fuel Description: Natural Gas	Fuel Consumption:
	Hours Of Operation: 8760 Hours per year	O <sub>2</sub> : 9.5%
	Load: 100%	H <sub>2</sub> O: 17%
	Propane: 1.61%	

Emission Data (100% Load)	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	Emission	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O <sub>2</sub>	ppmvd	g/kW-hr	
CO	2.8	49.15	431	833	3.755	8.28	0.33	5.76	50	98	0.44	0.97	88.3%
NMNEHC*	0.39	6.85	105	203	0.523	1.15	0.46	8.08	124	239	0.617	1.36	
CH <sub>2</sub> O	0.32	5.62	46	89	0.429	0.95	0.04	0.7	6	11	0.053	0.12	87.5%

<b>Replacement Element</b>	<b><u>Catalyst (Replacement Catalyst)</u></b>
	Element Model Number: APX3-OX-SQ-1550-2475-350
	Number of Catalyst Elements per Engine: 4
	Design Exhaust Flow Rate: 16,823 lb/hr
	Design Exhaust Temperature: 995° F
	Dimensions: 15.5 in x 24.75 in
	Exhaust Temperature Limits**: 550° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
	System Pressure Loss: 2.0 inH <sub>2</sub> O (Clean)

\* MW referenced as CH<sub>4</sub>. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

\*\* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

# Appendix C: Facility and Equipment Forms



**PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES**  
 NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8516 (9-2021)

**SECTION A - FACILITY INFORMATION**

Name of Firm or Organization 1804, Ltd.				
Applicant's Name Edward Aabak				
Title Managing Director		Telephone Number (720) 636-9691		E-mail Address eaabak@flatironsfs.com
Contact Person for Air Pollution Matters Eric Hammond				
Title Engineering Manager		Telephone Number (720) 636-9688		E-mail Address ehammond@flatironsfs.com
Mailing Address (Street & No.) 10385 Westmoor Drive, Suite 225				
City Westminster		State CO		ZIP Code 80021
Facility Name Springbrook Gas Plant				
Facility Address (Street & No.) 5621 131st Avenue				
City Williston		State ND		ZIP Code 58801
County <b>Williams</b>		Coordinates NAD 83 in Decimal Degrees (to fourth decimal degree)		
		Latitude 48.22972400	Longitude -103.51855800	
Legal Description of Facility Site				
Quarter SE	Quarter SE	Section 22	Township 155N	Range 100W
Land Area at Facility Site _____ Acres (or) _____ Sq. Ft.		MSL Elevation at Facility		

**SECTION B - GENERAL NATURE OF BUSINESS**

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Gas Processing Plant	221210	1311
Natural Gas Extraction	211130	1321

**SECTION C - GENERAL PERMIT INFORMATION**

Type of Permit? <input checked="" type="checkbox"/> Permit to Construct (PTC) <input type="checkbox"/> Permit to Operate (PTO)	
If application is for a Permit to Construct, please provide the following data:	
Planned Start Construction Date	Planned End Construction Date

**SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION**

Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	Permit to Construct				Minor Source Permit to Operate						
		New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
C-2711	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-2712	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-300A	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-300B	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-4711	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-5701	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-5702	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-2713	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GEN-1	Generator Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add additional pages if necessary

**SECTION D2 – APPLICABLE REGULATIONS**

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	See attached

**SECTION E – TOTAL POTENTIAL EMISSIONS**

Pollutant	Amount (Tons Per Year)
NO <sub>x</sub>	150.2
CO	222.4
PM	1.56

Pollutant	Amount (Tons Per Year)
PM <sub>10</sub> (filterable and condensable)	1.56
PM <sub>2.5</sub> (filterable and condensable)	1.56
SO <sub>2</sub>	0.38
VOC	162.0
GHG (as CO <sub>2</sub> e)	143,452
Largest Single HAP	8.24
Total HAPS	15.0

\*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

**SECTION F1 – ADDITIONAL FORMS**

Indicate which of the following forms are attached and made part of the application	
<input checked="" type="checkbox"/> Air Pollution Control Equipment (SFN 8532) <input type="checkbox"/> Construct/Operate Incinerators (SFN 8522) <input type="checkbox"/> Natural Gas Processing Plants (SFN 11408) <input type="checkbox"/> Glycol Dehydration Units (SFN 58923) <input type="checkbox"/> Flares (SFN 59652) <input type="checkbox"/> Grain, Feed, and Fertilizer Operations (SFN 8524)	<input type="checkbox"/> Fuel Burning Equipment Used for Indirect Heating (SFN 8518) <input type="checkbox"/> Hazardous Air Pollutant (HAP) Sources (SFN 8329) <input type="checkbox"/> Manufacturing or Processing Equipment (SFN 8520) <input type="checkbox"/> Volatile Organic Compounds Storage Tank (SFN 8535) <input checked="" type="checkbox"/> Internal Combustion Engines and Turbines (SFN 8891) <input type="checkbox"/> Oil/Gas Production Facility Registration (SFN 14334)

**SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION**

1. Process Description	4. Permit Application Forms
2. Facility Emission Summary	5. Emission Calculations
3. Regulatory Review Summary	6.

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature 	Date 9/15/25
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# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-2711		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3608 LE	Date of Manufacture 01/01/2014
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 2,370 bhp @ 1000 rpm	Operating Capacity (BHP @ rpm) 2,370 bhp @ 1000 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 130.2	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-2711	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.66	Gas Discharged (SCFM) 15,854	Exit Temp (°F) 877	Gas Velocity (FPS) 121

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	2.61	11.43	Manufacturer Specifications
CO	1.01	4.40	Manufacturer Specifications
PM	0.16	0.71	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.16	0.71	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.16	0.71	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.04	AP-42 Table 3.2-2
VOC	3.29	14.41	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,887	8,267	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.70	Manufacturer Specifications
Total HAPS	0.29	1.28	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-2711	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3608	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	93%	50%	88.2%	%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.50
	CO	g/hp-hr	2.75
	VOC	g/hp-hr	0.63
	HCHO	g/hp-hr	0.260
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O) 3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-2712		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3608 LE	Date of Manufacture 01/01/2014	
Reciprocating Internal Combustion Engine			
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn	
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn	
Maximum Rating (BHP @ rpm) 2,370 bhp @ 1000 rpm	Operating Capacity (BHP @ rpm) 2,370 bhp @ 1000 rpm		
Engine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart IIII			
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ			
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ			
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)			
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)			
Turbine			
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency
Turbine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK			

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 130.2	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-2712	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.33	Gas Discharged (SCFM) 16,180	Exit Temp (°F) 878	Gas Velocity (FPS) 193

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	2.61	11.43	Manufacturer Specifications
CO	1.01	4.40	Manufacturer Specifications
PM	0.16	0.71	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.16	0.71	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.16	0.71	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.04	AP-42 Table 3.2-2
VOC	3.29	14.41	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,887	8,267	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.70	Manufacturer Specifications
Total HAPS	0.29	1.28	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-2712	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3608	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	93%	50%	88.2%	%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.50
	CO	g/hp-hr	2.75
	VOC	g/hp-hr	0.63
	HCHO	g/hp-hr	0.26
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-2713		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3606 A4	Date of Manufacture 01/01/2019
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,875 bhp @ 1,000 rpm	Operating Capacity (BHP @ rpm) 1,875 bhp @ 1,000 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 103.1	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-2713	Stack Height Above Ground Level (feet) 28.6		
Stack Diameter (feet at top) 1.66	Gas Discharged (SCFM) 11,991	Exit Temp (°F) 813	Gas Velocity (FPS) 92

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	2.07	9.05	Manufacturer Specifications
CO	0.65	2.87	Manufacturer Specifications
PM	0.13	0.56	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.13	0.56	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.13	0.56	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.03	AP-42 Table 3.2-2
VOC	1.03	4.52	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,495	6,545	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.12	0.50	Manufacturer Specifications
Total HAPS	0.22	0.96	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-2713	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3606 A4	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	92.8%	50%	86.2%	13.8%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.50
	CO	g/hp-hr	2.20
	VOC	g/hp-hr	0.29
	HCHO	g/hp-hr	0.20
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) 300A		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3512B LE	Date of Manufacture 01/01/2013
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,035 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,035 bhp @ 1,400 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 60.67	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number 300A	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.0	Gas Discharged (SCFM) 6,517	Exit Temp (°F) 1,012	Gas Velocity (FPS) 138.29

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.14	4.99	Manufacturer Specifications
CO	0.37	1.60	Manufacturer Specifications
PM	0.08	0.33	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.02	AP-42 Table 3.2-2
VOC	0.57	2.50	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	879	3,851	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.15	0.64	Manufacturer Specifications
Total HAPS	0.21	0.91	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled 300A	

## SECTION B – EQUIPMENT

Type: <input type="checkbox"/> Cyclone <input type="checkbox"/> Multiclone <input type="checkbox"/> Baghouse <input type="checkbox"/> Electrostatic Precipitator				
<input type="checkbox"/> Wet Scrubber <input type="checkbox"/> Spray Dryer <input type="checkbox"/> Flare/Combustor				
<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC				
Name of Manufacturer Caterpillar		Model Number G3512B LE		Date to Be Installed currently operating
Application: <input type="checkbox"/> Boiler <input type="checkbox"/> Kiln <input checked="" type="checkbox"/> Engine <input type="checkbox"/> Other – Specify:				
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	93.8%	50%	88.1%	50%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	2.58
	VOC	g/hp-hr	0.50
	HCHO	g/hp-hr	0.54
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) 300B		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3516B LE	Date of Manufacture 01/01/2013	
Reciprocating Internal Combustion Engine			
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn	
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn	
Maximum Rating (BHP @ rpm) 1,035 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,035 bhp @ 1,400 rpm		
Engine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart IIII			
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ			
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ			
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)			
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)			
Turbine			
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency
Turbine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK			

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 60.67	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number 300B	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.0	Gas Discharged (SCFM) 6,545	Exit Temp (°F) 1,012	Gas Velocity (FPS) 138.89

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Complete and attach form SFN 8532
--

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.14	4.99	Manufacturer Specifications
CO	0.37	1.60	Manufacturer Specifications
PM	0.08	0.33	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.02	AP-42 Table 3.2-2
VOC	0.57	2.50	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	879	3,851	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.15	0.64	Manufacturer Specifications
Total HAPS	0.21	0.91	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled 300B	

## SECTION B – EQUIPMENT

Type: <input type="checkbox"/> Cyclone <input type="checkbox"/> Multiclone <input type="checkbox"/> Baghouse <input type="checkbox"/> Electrostatic Precipitator				
<input type="checkbox"/> Wet Scrubber <input type="checkbox"/> Spray Dryer <input type="checkbox"/> Flare/Combustor				
<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC				
Name of Manufacturer Caterpillar	Model Number G3516		Date to Be Installed currently operating	
Application: <input type="checkbox"/> Boiler <input type="checkbox"/> Kiln <input checked="" type="checkbox"/> Engine <input type="checkbox"/> Other – Specify:				
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	88%	50%	69%	60%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)		3,433	9,477
Gas Temperature (°F)		450	971
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	3.54
	VOC	g/hp-hr	0.43
	HCHO	g/hp-hr	0.26
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-4711		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3512B LE	Date of Manufacture 01/01/2014	
Reciprocating Internal Combustion Engine			
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn	
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn	
Maximum Rating (BHP @ rpm) 1,035 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,035 bhp @ 1,400 rpm		
Engine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart IIII			
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ			
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ			
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)			
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)			
Turbine			
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency
Turbine Subject to:			
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK			

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 60.7	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-4711		Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 0.92	Gas Discharged (SCFM) 6,681	Exit Temp (°F) 992	Gas Velocity (FPS) 169	

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Complete and attach form SFN 8532
--

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.14	4.99	Manufacturer Specifications
CO	0.50	2.01	Manufacturer Specifications
PM	0.08	0.33	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.02	AP-42 Table 3.2-2
VOC	1.05	4.59	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	879	3,851	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.17	0.75	Manufacturer Specifications
Total HAPS	0.23	1.02	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-4711	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3512B LE	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	92.2%	50%	86.1%	8.0
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.50
	CO	g/hp-hr	2.58
	VOC	g/hp-hr	0.50
	HCHO	g/hp-hr	0.54
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-5701		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3512B LE	Date of Manufacture 01/01/2014
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,035 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,035 bhp @ 1,400 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 60.7	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-5701	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 0.92	Gas Discharged (SCFM) 6,675	Exit Temp (°F) 992	Gas Velocity (FPS) 169

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.14	4.99	Manufacturer Specifications
CO	0.46	2.01	Manufacturer Specifications
PM	0.08	0.33	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.02	AP-42 Table 3.2-2
VOC	1.05	4.59	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	879	3,851	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.17	0.75	Manufacturer Specifications
Total HAPS	0.23	1.02	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-5701	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3512B LE	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	
Design Efficiency (%)	92.3%	50%	82.1%	
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	2.86
	VOC	g/hp-hr	0.46
	HCHO	g/hp-hr	0.45
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) C-5702		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Compressor Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3512B LE	Date of Manufacture 01/01/2014
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,035 bhp @ 1,400 rpm	Operating Capacity (BHP @ rpm) 1,035 bhp @ 1,400 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 60.7	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number C-5702	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 0.92	Gas Discharged (SCFM) 6,665	Exit Temp (°F) 999	Gas Velocity (FPS) 169

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	1.14	4.99	Manufacturer Specifications
CO	0.46	2.01	Manufacturer Specifications
PM	0.08	0.33	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.08	0.33	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.02	AP-42 Table 3.2-2
VOC	1.05	4.59	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	879	3,851	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.17	0.75	Manufacturer Specifications
Total HAPS	0.23	1.02	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled C-5702	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3512B LE	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	
Design Efficiency (%)	92.3%	50%	82.1%	
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	0.5
	CO	g/hp-hr	2.86
	VOC	g/hp-hr	0.46
	HCHO	g/hp-hr	0.45
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
3.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) GEN-1		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Generator Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3516B LE	Date of Manufacture 01/01/2014
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,818 bhp @ 1,800 rpm	Operating Capacity (BHP @ rpm) 1,818 bhp @ 1,800 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 104.5	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number GEN-1	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.33	Gas Discharged (SCFM) 12,064	Exit Temp (°F) 990	Gas Velocity (FPS) 144

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit?  
 No       Yes – Complete and attach form SFN 8532

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	4.00	17.54	Manufacturer Specifications
CO	1.31	5.75	Manufacturer Specifications
PM	0.13	0.57	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.13	0.57	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.13	0.57	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.03	AP-42 Table 3.2-2
VOC	1.56	6.84	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,515	6,636	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.70	Manufacturer Specifications
Total HAPS	0.27	1.17	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  
 YES       NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled GEN-1	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3516B LE	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	88.3%	50%	87.5%	%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	1.0
	CO	g/hp-hr	2.80
	VOC	g/hp-hr	0.39
	HCHO	g/hp-hr	0.32
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O) 2.0			



# PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF AIR QUALITY  
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.  
- Must include SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
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## SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516) GEN-2		
Type of Unit (check all that apply)	<input checked="" type="checkbox"/> Stationary Natural Gas-Fired Engine	<input type="checkbox"/> Emergency Use Only
	<input type="checkbox"/> Stationary Diesel and Dual Fuel Engine	<input checked="" type="checkbox"/> Non-Emergency Use
	<input type="checkbox"/> Stationary Gasoline Engine	<input type="checkbox"/> Peaking
	<input type="checkbox"/> Stationary Natural Gas-Fired Turbine	<input type="checkbox"/> Demand Response
	<input checked="" type="checkbox"/> Other – Specify: <b>Generator Engine</b>	

## SECTION C – MANUFACTURER DATA

Make Caterpillar	Model G3516B LE	Date of Manufacture 01/01/2014
Reciprocating Internal Combustion Engine		
<input checked="" type="checkbox"/> Spark Ignition	<input type="checkbox"/> Compression Ignition	<input checked="" type="checkbox"/> Lean Burn
<input checked="" type="checkbox"/> 4 Stroke	<input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn
Maximum Rating (BHP @ rpm) 1,818 bhp @ 1,800 rpm	Operating Capacity (BHP @ rpm) 1,818 bhp @ 1,800 rpm	
Engine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart IIII		
<input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ		
<input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ		
<input type="checkbox"/> 40 CFR 60, Subpart OOOO (for compressors)		
<input type="checkbox"/> 40 CFR 60, Subpart OOOOa (for compressors)		
Turbine		
Dry Low Emissions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)
		Efficiency
Turbine Subject to:		
<input type="checkbox"/> 40 CFR 60, Subpart GG <input type="checkbox"/> 40 CFR 60, Subpart KKKK		

## SECTION D – FUELS USED

Natural Gas (10 <sup>6</sup> cu ft/year) 104.5	Percent Sulfur N/A	Percent H <sub>2</sub> S N/A
Oil (gal/year) N/A	Percent Sulfur N/A	Grade No. N/A
LP Gas (gal/year) N/A	Other – Specify:	

## SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day 24	Days Per Week 7	Weeks Per Year 52	Hours Per Year 8760	Peak Production Season (if any) N/A
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## SECTION F – STACK PARAMETERS

Emission Point ID Number GEN-2	Stack Height Above Ground Level (feet) 46.5		
Stack Diameter (feet at top) 1.33	Gas Discharged (SCFM) 12,064	Exit Temp (°F) 990	Gas Velocity (FPS) 144

**SECTION G – EMISSION CONTROL EQUIPMENT**

Is any emission control equipment installed on this unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Complete and attach form SFN 8532
--

**SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED**

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO <sub>x</sub>	4.00	17.54	Manufacturer Specifications
CO	1.32	5.79	Manufacturer Specifications
PM	0.13	0.57	AP-42 Table 3.2-2
PM <sub>10</sub> (filterable and condensable)	0.13	0.57	AP-42 Table 3.2-2
PM <sub>2.5</sub> (filterable and condensable)	0.13	0.57	AP-42 Table 3.2-2
SO <sub>2</sub>	0.01	0.03	AP-42 Table 3.2-2
VOC	1.31	5.75	Manufacturer Specifications
GHG (as CO <sub>2e</sub> )	1,515	6,636	40 CFR 98, Subpart C, Table C-1 & C-2
Largest Single HAP	0.16	0.72	Manufacturer Specifications
Total HAPS	0.27	1.19	AP-42 Table 3.2-2

\* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

**SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:**

North Dakota Department of Environmental Quality  
 Division of Air Quality  
 4201 Normandy Street, 2<sup>nd</sup> Floor  
 Bismarck, ND 58503-1324  
 (701) 328-5188



# PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.

- Must also include forms SFN 8516 or SFN 52858

## SECTION A – GENERAL INFORMATION

Name of Firm or Organization 1804, Ltd.	Facility Name Springbrook Gas Plant
Source ID No. of Equipment being Controlled GEN-2	

## SECTION B – EQUIPMENT

Type:	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator
	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer	<input type="checkbox"/> Flare/Combustor	
	<input checked="" type="checkbox"/> Other – Specify: Oxidation Catalyst & AFRC			
Name of Manufacturer Caterpillar	Model Number G3516B LE	Date to Be Installed currently operating		
Application:	<input type="checkbox"/> Boiler	<input type="checkbox"/> Kiln	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Other – Specify:
Pollutants Removed	CO	HAPs	HCHO	VOC
Design Efficiency (%)	88.3%	50%	87.5%	%
Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

## SECTION CD – GAS CONDITIONS

Gas Conditions		Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			
Gas Temperature (°F)		550	1,250
Gas Pressure (in. H <sub>2</sub> O)			
Gas Velocity (ft/sec)			
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration	
	NOx	g/hp-hr	1.0
	CO	g/hp-hr	2.80
	VOC	g/hp-hr	0.39
	HCHO	g/hp-hr	0.32
Pressure Drop Through Gas Cleaning Device (in. H <sub>2</sub> O)			
2.0			



**PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES**  
 NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DIVISION OF AIR QUALITY  
 SFN 8516 (9-2021)

**SECTION A - FACILITY INFORMATION**

Name of Firm or Organization 1804, Ltd.				
Applicant's Name Edward Aabak				
Title Managing Director		Telephone Number (720) 636-9691		E-mail Address eaabak@flatironsfs.com
Contact Person for Air Pollution Matters Eric Hammond				
Title Engineering Manager		Telephone Number (720) 636-9688		E-mail Address ehammond@flatironsfs.com
Mailing Address (Street & No.) 10385 Westmoor Drive, Suite 225				
City Westminster		State CO		ZIP Code 80021
Facility Name Springbrook Gas Plant				
Facility Address (Street & No.) 5621 131st Avenue				
City Williston		State ND		ZIP Code 58801
County <b>Williams</b>		Coordinates NAD 83 in Decimal Degrees (to fourth decimal degree)		
		Latitude 48.22972400	Longitude -103.51855800	
Legal Description of Facility Site				
Quarter SE	Quarter SE	Section 22	Township 155N	Range 100W
Land Area at Facility Site _____ Acres (or) _____ Sq. Ft.		MSL Elevation at Facility		

**SECTION B – GENERAL NATURE OF BUSINESS**

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Gas Processing Plant	221210	1311
Natural Gas Extraction	211130	1321

**SECTION C – GENERAL PERMIT INFORMATION**

Type of Permit? <input checked="" type="checkbox"/> Permit to Construct (PTC) <input type="checkbox"/> Permit to Operate (PTO)	
If application is for a Permit to Construct, please provide the following data:	
Planned Start Construction Date	Planned End Construction Date

**SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION**

Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	Permit to Construct				Minor Source Permit to Operate						
		New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
C-2711	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-2712	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-300A	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-300B	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-4711	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-5701	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-5702	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C-2713	Compressor Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GEN-1	Generator Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add additional pages if necessary

**SECTION D2 – APPLICABLE REGULATIONS**

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	See attached

**SECTION E – TOTAL POTENTIAL EMISSIONS**

Pollutant	Amount (Tons Per Year)
NO <sub>x</sub>	150.2
CO	222.4
PM	1.56

Pollutant	Amount (Tons Per Year)
PM <sub>10</sub> (filterable and condensable)	1.56
PM <sub>2.5</sub> (filterable and condensable)	1.56
SO <sub>2</sub>	0.38
VOC	162.0
GHG (as CO <sub>2</sub> e)	143,452
Largest Single HAP	8.24
Total HAPS	15.0

\*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

**SECTION F1 – ADDITIONAL FORMS**

Indicate which of the following forms are attached and made part of the application	
<input checked="" type="checkbox"/> Air Pollution Control Equipment (SFN 8532) <input type="checkbox"/> Construct/Operate Incinerators (SFN 8522) <input type="checkbox"/> Natural Gas Processing Plants (SFN 11408) <input type="checkbox"/> Glycol Dehydration Units (SFN 58923) <input type="checkbox"/> Flares (SFN 59652) <input type="checkbox"/> Grain, Feed, and Fertilizer Operations (SFN 8524)	<input type="checkbox"/> Fuel Burning Equipment Used for Indirect Heating (SFN 8518) <input type="checkbox"/> Hazardous Air Pollutant (HAP) Sources (SFN 8329) <input type="checkbox"/> Manufacturing or Processing Equipment (SFN 8520) <input type="checkbox"/> Volatile Organic Compounds Storage Tank (SFN 8535) <input checked="" type="checkbox"/> Internal Combustion Engines and Turbines (SFN 8891) <input type="checkbox"/> Oil/Gas Production Facility Registration (SFN 14334)

**SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION**

1. Process Description	4. Permit Application Forms
2. Facility Emission Summary	5. Emission Calculations
3. Regulatory Review Summary	6.

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature 	Date 9/15/25
---	-----------------

## Thorsteinson, Kari M.

---

**From:** EJ Lachendro <elachendro@spiritenv.com>  
**Sent:** Tuesday, January 6, 2026 1:46 PM  
**To:** Thorsteinson, Kari M.; Stroh, David E.  
**Cc:** Jon Hippe  
**Subject:** Re: 1804 Ltd Stockyard Creek CS And Springbrook Gas Plant Construction Permit Status  
**Attachments:** 2026.01\_Springbrook Gas Plant Permit Mod - HAP Reclassification update.pdf

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Good afternoon Kari,

Thanks for chatting with me yesterday about the Springbrook Draft permit. As we discussed, we would like to update the proposed VOC emission limits for three of the engines. I've summarized the requested updates below and attached the emissions summaries. Please let me know if you need anything else.

### Unit Specific Emissions Updates:

C-300A VOC emission limit change from 0.25 g/hp-hr to 0.46 g/hp-hr

C-300B VOC emission limit change from 0.25 g/hp-hr to 0.46 g/hp-hr

C-2713 VOC emission limit change from 0.25 g/hp-hr to 0.63 g/hp-hr

### Facility-Wide Emissions Updates:

Total VOC emissions change from 162.00 tpy to 173.07 tpy

The increase in VOC emissions will not change any NDDEQ or Federal NSPS/MACT rule applicability.

In addition to the VOC emission updates, we also have the following questions/comments about the Draft permit and the AQEA.

(pg.2 comment) to clarify, the two new engines (100C and 100D) are rotary screw refrigeration compressors operating on a closed loop refrigeration system and are not subject to OOOOb.

(pg.2 comment) yes, please match the EP numbers to the EU numbers

(pg.2) the engines are incorrectly shown as G2516B L natural gas-fired engines  
- can you please correct them to G3516

(pg.3 &4) why is there a superscript "A" after "Emission Unit Description" in the table headings?  
- superscript A notates insignificant or fugitive emission sources (no specific limit).

In the Facility Wide Emissions Profile of the AQEA, many of the emissions are slightly higher than the emissions submitted with the permit app, is there a reason for this? I believe they're all higher values, so we're fine leaving it, but still wanted to ask.

Thanks,

**EJ Lachendro**

Consultant  
RMR Air Quality & Compliance Services  
**MOBILE** 303-578-2635  
[elachendro@spiritenv.com](mailto:elachendro@spiritenv.com)



1536 Wynkoop St. Suite 210 | Denver, CO 80202  
**MAIN** 720-500-3710 | **FAX** 281-664-2491  
[spiritenv.com](http://spiritenv.com)

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**From:** EJ Lachendro <elachendro@spiritenv.com>  
**Sent:** Monday, December 15, 2025 4:38 PM  
**To:** Thorsteinson, Kari M. <kmThorsteinson@nd.gov>; Stroh, David E. <destroh@nd.gov>  
**Cc:** Jon Hippe <jhippe@flatironsfs.com>  
**Subject:** Re: 1804 Ltd Stockyard Creek CS And Springbrook Gas Plant Construction Permit Status

Good evening Kari,

Thanks for sending these. Eric is no longer with the company. I'll review the Springbrook draft docs this week and get back to you with comments as soon as possible.

Thanks,

**EJ Lachendro**

Consultant  
RMR Air Quality & Compliance Services  
**MOBILE** 303-578-2635  
[elachendro@spiritenv.com](mailto:elachendro@spiritenv.com)



1536 Wynkoop St. Suite 210 | Denver, CO 80202  
**MAIN** 720-500-3710 | **FAX** 281-664-2491  
[spiritenv.com](http://spiritenv.com)

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**From:** Thorsteinson, Kari M. <kmThorsteinson@nd.gov>  
**Sent:** Friday, December 12, 2025 10:40 AM  
**To:** EJ Lachendro <elachendro@spiritenv.com>; Stroh, David E. <deStroh@nd.gov>  
**Cc:** Jon Hippe <jhippe@flatironsfs.com>  
**Subject:** RE: 1804 Ltd Stockyard Creek CS And Springbrook Gas Plant Construction Permit Status

EXTERNAL EMAIL - This email was sent by a person from outside your organization. Exercise caution when clicking links, opening attachments or taking further action, before validating its authenticity.

Good Morning,

The Stockyard Creek permit is being mailed out today. See attached pdf. The Springbrook Gas Plant draft documents were emailed to Jon and Eric on November 11 for company review. I typically send draft documents for review to the company and let them know they can pass it along. I have attached the draft documents for Springbrook here also.

Let me know if you have any more questions.

*Kari Thorsteinson*

North Dakota Department of Environmental Quality  
Division of Air Quality  
701-328-1337 • [kmthorsteinson@nd.gov](mailto:kmthorsteinson@nd.gov)

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**From:** EJ Lachendro <elachendro@spiritenv.com>  
**Sent:** Friday, December 12, 2025 6:59 AM  
**To:** Thorsteinson, Kari M. <kmThorsteinson@nd.gov>; Stroh, David E. <deStroh@nd.gov>  
**Cc:** Jon Hippe <jhippe@flatironsfs.com>  
**Subject:** 1804 Ltd Stockyard Creek CS And Springbrook Gas Plant Construction Permit Status

\*\*\*\*\* **CAUTION:** This email originated from an outside source. Do not click links or open attachments unless you know they are safe. \*\*\*\*\*

Good morning Kari and David,

We wanted to check-in on the status of the Stockyard and Springbrook construction permits. I believe the last update for Stockyard was that it needed to be prepared for public comment. The permitting fee was paid via CERIS-ND and we reviewed the draft permit and responded to Kari's email. The last update for Springbrook was that it was in the final review stage and that we should receive the draft permit soon.

Can you please provide a quick update? Feel free to call me if it's easier to discuss.

Thanks,

**EJ Lachendro**

Consultant  
RMR Air Quality & Compliance Services  
**MOBILE** 303-578-2635  
[elachendro@spiritenv.com](mailto:elachendro@spiritenv.com)



1536 Wynkoop St. Suite 210 | Denver, CO 80202  
**MAIN** 720-500-3710 | **FAX** 281-664-2491  
[spiritenv.com](http://spiritenv.com)

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**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Criteria Pollutant	PM <sub>10</sub> (TPY)	PM <sub>2.5</sub> (TPY)	NO <sub>x</sub> (TPY)	SO <sub>2</sub> (TPY)	CO (TPY)	VOC (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B L	0.55	0.55	6.46	0.03	2.24	4.24
C-2711	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.40	14.40
C-2712	Compressor Engine Caterpillar G3608 LE	0.01	0.01	11.43	0.04	4.40	14.40
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	1.60	4.59
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	1.60	4.59
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-5701	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-5702	Lift Compressor Engine Caterpillar G3512B LE	0.00	0.00	4.99	0.02	2.01	4.59
C-2713	Compressor Engine Caterpillar G3606 A4	0.00	0.00	9.04	0.03	2.87	11.40
GEN1	Genset 1 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	5.75	6.84
GEN2	Genset 2 Engine Caterpillar G3516B LE	0.00	0.00	17.54	0.03	5.75	6.84
B-940	Hot Oil Heater	0.31	0.31	4.07	0.02	3.42	0.22
B-941	Hot Oil Heater	0.08	0.08	1.01	0.01	0.85	0.06
H-951	Glycol Heat Medium	0.09	0.09	1.21	0.01	1.02	0.07
TK-1	Oily Water Tank	---	---	---	---	---	5.73
FL-8501	Facility Emergency and Process Flare	---	---	39.65	0.00	180.76	36.11
LOAD1	NGL Loadout	---	---	---	---	---	1.05
LOAD2	Condensate Loadout	---	---	---	---	---	8.05
LOAD3	Oily Water Tank Loadout	---	---	---	---	---	0.32
PIG1	Pig Receiving	---	---	0.00	---	0.00	13.91
LIFTBD	Lift Compressor Blowdown	---	---	---	---	---	0.01
COMPBD	Compressor Blowdown	---	---	---	---	---	0.12
T-510/V-520	EG Still Vent and Flash Drum	---	---	---	---	---	0.14
FUG	Fugitive	---	---	---	---	---	21.95
<b>TOTAL REQUESTED</b>		<b>1.61</b>	<b>1.61</b>	<b>150.82</b>	<b>0.38</b>	<b>222.91</b>	<b>173.07</b>

Proposed modifications

**Emissions Summary**  
**1804, Ltd.**  
**Springbrook Gas Plant**

Emission Unit (EU) ID	Hazardous Air Pollutant	HAP (TPY)	n-Hexane (TPY)	Benzene (TPY)	Toluene (TPY)	E-benzene (TPY)	Xylenes (TPY)	MeOH (TPY)	224-TMP (TPY)	Acetaldehyde (TPY)	Acrolein (TPY)	CH <sub>2</sub> O (TPY)
100C	Rotary Screw Compressor 1 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
100D	Rotary Screw Compressor 2 Engine Caterpillar G3516B LE	1.150	---	0.012	---	---	---	0.069	---	0.229	0.141	0.699
C-2711	Compressor Engine Caterpillar G3608 LE	1.282	---	0.016	---	---	---	0.088	---	0.295	0.182	0.701
C-2712	Compressor Engine Caterpillar G3608 LE	1.282	---	0.016	---	---	---	0.088	---	0.295	0.182	0.701
C-300A	Refrigeration Compressor Engine Caterpillar G3512B LE	0.912	---	0.007	---	---	---	0.041	---	0.138	0.085	0.642
C-300B	Refrigeration Compressor Engine Caterpillar G3512B LE	0.912	---	0.007	---	---	---	0.041	---	0.138	0.085	0.642
C-5701	Lift Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
C-5702	Lift Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
C-2713	Compressor Engine Caterpillar G3606 A4	0.959	---	0.012	---	---	---	0.070	---	0.234	0.144	0.499
C-4711	Overhead Compressor Engine Caterpillar G3512B LE	1.020	---	0.007	---	---	---	0.041	---	0.138	0.085	0.749
GEN1	Genset 1 Engine Caterpillar G3516B LE	1.168	---	0.012	---	---	---	0.071	---	0.237	0.146	0.702
GEN2	Genset 2 Engine Caterpillar G3516B LE	1.168	---	0.012	---	---	---	0.071	---	0.237	0.146	0.702
B-940	Hot Oil Heater	0.012	0.009	0.000	0.000	---	---	---	---	---	---	0.003
B-941	Hot Oil Heater	0.003	0.002	0.000	0.000	---	---	---	---	---	---	0.001
H-951	Glycol Heat Medium	0.002	0.001	0.000	0.000	---	---	---	---	---	---	0.000
TK-1	Oily Water Tank	1.136	0.988	0.020	0.020	0.003	0.006	---	0.100	---	---	---
FL-8501	Facility Emergency and Process Flare	0.007	0.006	0.001	0.000	0.000	0.000	---	0.000	---	---	---
LOAD1	NGL Loadout	0.018	0.016	0.001	0.001	0.000	0.000	---	---	---	---	---
LOAD2	Condensate Loadout	0.090	0.077	0.005	0.002	0.000	0.001	---	0.005	---	---	---
LOAD3	Oily Water Tank Loadout	0.072	0.000	0.059	0.011	0.002	0.000	---	0.000	---	---	---
PIG1	Pig Receiving	0.488	0.457	0.020	0.007	0.000	0.004	---	---	---	---	---
LIFTBD	Lift Compressor Blowdown	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
COMPBD	Compressor Blowdown	0.004	0.004	0.000	0.000	0.000	0.000	---	---	---	---	---
T-510/V-520	EG Still Vent and Flash Drum	0.000	0.000	0.000	0.000	0.000	0.000	---	---	---	---	---
FUG	Fugitive	0.172	0.149	0.007	0.003	0.001	0.001	---	0.004	---	---	---
<b>TOTAL REQUESTED</b>		<b>15.048</b>	<b>1.711</b>	<b>0.240</b>	<b>0.044</b>	<b>0.005</b>	<b>0.012</b>	<b>0.731</b>	<b>0.110</b>	<b>2.445</b>	<b>1.503</b>	<b>8.240</b>

Proposed modifications

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-300A - Refrig and Lift Gas Compressors		
Type	Caterpillar G3512B		
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,035	hp	
Site Rated Horsepower	1,035	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	7,260	Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	60,667	Mscf	60.67 MMscf
Fuel Use Rate	6,925	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.049	0.160	0.365	---	1.597	93.8%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.140	0.460	1.049	---	4.593	8.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.019	0.064	0.146	1,283	0.642	88.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			<b>879.21</b>			<b>3,850.94</b>	<b>3493.51</b>

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-300B - Refrig and Lift Gas Compressors	
Type	Caterpillar G3512B	
Emission Control	Ultra Lean Burn Engines, Oxidation Catalyst with AFRC	
Maximum Horsepower	1,035 hp	
Site Rated Horsepower	1,035 hp	
Annual Hours of Operation	8,760 hrs	
Fuel Consumption (LHV)	7,260 Btu/hp-hr	7.51 MMBtu/hr
Fuel Heat Content	1,085 Btu/SCF	
Annual Fuel Consumption	60,667 Mscf	60.67 MMscf
Fuel Use Rate	6,925 scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.152	0.500	1.140	---	4.993	0%
CO <sup>a, h</sup>	0.783	2.580	5.882	---	25.76	0.049	0.160	0.365	---	1.597	93.8%
VOC <sup>a, h</sup>	0.152	0.500	1.140	---	4.99	0.140	0.460	1.049	---	4.593	8.0%
Formaldehyde <sup>a, h</sup>	0.164	0.540	1.231	10,784	5.39	0.019	0.064	0.146	1,283	0.642	88.1%
SO <sub>2</sub> <sup>d</sup>	5.88E-04	0.002	0.004	---	0.02	5.88E-04	0.002	0.004	---	0.019	0%
PM <sup>b, c</sup>	9.99E-03	0.033	0.075	---	0.33	9.99E-03	0.033	0.075	---	0.329	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.00	7.71E-05	0.000	0.001	---	0.003	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.028	0.063	550	0.28	8.36E-03	0.014	0.031	275	0.138	50%
Acrolein <sup>b</sup>	5.14E-03	0.017	0.039	338	0.17	5.14E-03	0.008	0.019	169	0.085	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.003	29	0.01	4.40E-04	0.001	0.002	14	0.007	50%
Methanol <sup>d</sup>	2.50E-03	0.008	0.019	165	0.08	2.50E-03	0.004	0.009	82	0.041	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	384.93	878.30	3846.96	1	3846.96	3489.90
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	2.16	1.96
CH <sub>4</sub>	0.001	0.01	0.02	0.07	25	1.81	1.65
<b>Total</b>			879.21			3,850.94	3493.51

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C

**Engine Emission Calculations**  
**1804, Ltd.**  
**Springbrook Gas Plant**

**Basis**

Unit(s)	C-2713 - Inlet Compression		
Type	Caterpillar G3606		
Emission Control	Lean Burn Engine, Oxidation Catalyst with AFRC		
Maximum Horsepower	1,875	hp	
Site Rated Horsepower	1,875	hp	
Annual Hours of Operation	8,760	hrs	
Fuel Consumption (LHV)	6,812	Btu/hp-hr	12.77 MMBtu/hr
Fuel Heat Content	1,085	Btu/SCF	
Annual Fuel Consumption	103,122	Mscf	103.12 MMscf
Fuel Use Rate	11,771.89	scf/hr	

**Emissions Estimate (per engine)**

Pollutant	Uncontrolled					Controlled					Reduction Efficiency
	Emissions Factor		Emissions			Emissions Factor		Emissions			
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO <sub>x</sub> <sup>a, h</sup>	0.162	0.500	2.065	---	9.045	0.162	0.500	2.065	---	9.045	0%
CO <sup>a, h</sup>	0.711	2.200	9.086	---	39.796	0.051	0.158	0.654	---	2.865	92.8%
VOC <sup>a, h</sup>	0.204	0.630	2.602	---	11.396	0.204	0.630	2.602	---	11.396	0.0%
Formaldehyde <sup>a, h</sup>	0.065	0.200	0.826	7235.683	3.618	0.009	0.028	0.114	998.524	0.499	86.2%
SO <sub>2</sub> <sup>b</sup>	5.88E-04	0.002	0.008	---	0.033	5.88E-04	0.002	0.008	---	0.033	0%
PM <sup>b, c</sup>	9.99E-03	0.031	0.128	---	0.559	9.99E-03	0.031	0.128	---	0.559	0%
PM <sub>10</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
PM <sub>2.5</sub> (filterable) <sup>d</sup>	7.71E-05	0.000	0.001	---	0.004	7.71E-05	0.000	0.001	---	0.004	0%
Acetaldehyde <sup>b</sup>	8.36E-03	0.026	0.107	935.376	0.468	8.36E-03	0.013	0.053	467.688	0.234	50%
Acrolein <sup>b</sup>	5.14E-03	0.016	0.066	575.100	0.288	5.14E-03	0.008	0.033	287.550	0.144	50%
Benzene <sup>b</sup>	4.40E-04	0.001	0.006	49.230	0.025	4.40E-04	0.001	0.003	24.615	0.012	50%
Methanol <sup>u</sup>	2.50E-03	0.008	0.032	279.718	0.140	2.50E-03	0.004	0.016	139.859	0.070	50%

Uncontrolled Emission Factors from <sup>a</sup> Manufacturer's Specifications or <sup>b</sup> AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean Burn Engines

<sup>c</sup> AP-42 PM Emission Factor is Total of Filterable and Condensable

<sup>h</sup> Controlled Emission Factors from Manufacturer's Specifications.

Greenhouse Gas	Emissions Factor <sup>d</sup>		Emissions <sup>e</sup>		GWP <sup>f</sup>	CO <sub>2</sub> e Emissions <sup>g</sup>	
	(kg/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		(tpy)	(mtpy)
CO <sub>2</sub>	53.02	361.17	1492.94	6539.08	1	6539.08	5932.15
N <sub>2</sub> O	0.0001	0.00	0.00	0.01	298	3.68	3.33
CH <sub>4</sub>	0.001	0.01	0.03	0.12	25	3.08	2.80
<b>Total</b>			1,494.48			6,545.84	5938.29

<sup>d</sup>Emission Factors From 40 CFR 98, Subpart C, Table C-1 & C-2

<sup>e</sup>Emissions calculated using Equation C-1, 40 CFR 98 Subpart C

<sup>f</sup>Global Warming Potential From 40 CFR 98, Subpart A, Table A-1

<sup>g</sup>Emissions calculated using Equation A-1, 40 CFR 98 Subpart C