

STATEMENT OF BASIS

To: Reviewers
Through: Lori Bocchino, Operating Permit Program Manager
From: Despina Nikolova, Air Quality Engineer
Subject: Draft Operating Permit 3-2-005, Northwest Pipeline GP
Green River Compressor Station
Date: April 27, 2012

Introduction:

Attached is the draft renewal Wyoming Air Quality Standards and Regulations (WAQSR) Ch 6, Sec 3 operating permit for Northwest Pipeline GP, Green River Compressor Station. This facility functions as a mainline pressure booster station for the Northwest Pipeline natural gas transmission system. The station is designed to compress natural gas for transmission down a bi-directional pipeline. Emission points at the facility include four 1500 hp Cooper Bessemer GMWC-6 compressor engines, one 6130 hp Solar Centaur 50 T-6100S turbine, one 400 hp Caterpillar 3408SI generator engine, one 499 hp Caterpillar 3512SITA generator engine, one 3.35 Million Btu per hour (MMBtu/hr) Sellers C-80-W boiler, 18 miscellaneous catalytic heaters, one Sivalss fuel gas line heater, and fugitive emissions. The Green River Compressor Station is a major source of Hazardous Air Pollutants (HAPs).

Permitting History:

The four 1500 hp Cooper Bessemer GMWC-6 compressor engines were built in 1955, pre-dating WAQSR Ch 6, Sec 2 permitting requirements.

There are no remaining applicable requirements from the permits listed in this paragraph. They are listed for permitting history only. CT-154 (7/10/78); was issued for the construction of one 2,596 hp natural gas turbine compressor. OP-77 (1/29/81); granted approval for operation of one Model C 304-2D Solar Centrifugal Compressor and one Model T-3002R Solar Centaur Recuperated Turbine. Waiver (8/24/89); was issued for replacement of two 100 HP LeRoi natural gas generator engines (installed in 1956) with two 400 hp Caterpillar 3408SI generator engines. Waiver (2/2/96); approved an increase in hp for the turbine from 2,596 to 2,731. The turbine was permitted under CT-154. MD-427 (12/29/99); allowed for an increase in operating hours for the 3,228 hp Solar Centaur model T-3550 turbine compressor engine, an increase in the NO_x limits for four 1,500 hp Cooper Bessemer compressor engines, removal of one of the existing 400 hp Caterpillar electric generator engines, and allowed the remaining 400 hp Caterpillar electric generator engine to operate continuously at full load. Permit MD-427A, listed below, superseded all previously issued permits and waivers for this facility.

MD-427A (3/31/00); was issued to increase CO emission limits for the compressor engines, replace the existing Solar Centaur T-3002 turbine compressor engine with a new model T-3550, and to update the facility permitting to reflect the current station configuration. Portions of this permit are superseded by MD-863 and MD-1008A2. The applicable requirement remaining from this permit is to follow the preventative maintenance plan for all engines at the facility.

Waiver (7/20/00); allowed for the Caterpillar 3804SI generator engine to be used as backup instead of a full-time power generation unit. This waiver is superseded by MD-1008A2.

MD-863 (3/31/03); was issued for the replacement of the existing turbine with a 6130 hp Solar Centaur 50 T-6100S turbine. Applicable requirements for the turbine include: NO_x and CO emission limits in

units of ppmv @ 15% O₂, and lb/hr for ambient temperatures greater than zero degrees Fahrenheit; recordkeeping of the days the ambient temperature is below zero degrees Fahrenheit; maintain in accordance with the manufacturer's specifications; annual NO_x and CO emissions monitoring; and compliance with 40 CFR Part 60, Subpart GG, including monitoring the sulfur content of the fuel in accordance with Subpart GG. In a letter received August 9, 2004, Northwest Pipeline Corporation informed the Division of intent to comply with the July 8, 2004 revisions to Subpart GG. All conditions of permit MD-427A pertaining to the Solar Centaur T-3550 turbine were superseded by the conditions of this permit.

MD-1008 (6/14/04): was issued for the addition of two 738 hp Caterpillar 3512SITA generator engines at the facility. Only one engine was installed. MD-1008A (8/23/2004): amended permit MD-1008 to reflect a reduction in the site rated horsepower of the Caterpillar 3512SITA generator engine from 738 hp to 499 hp and allowed replacement of the 3.3 MMBtu/hr Kewanee boiler with a 3.35 MMBtu/hr Sellers model C-80-W boiler.

MD-1008A2 (7/29/05): amended permit MD-1008A to increase CO emission for the Caterpillar 3408SI generator engine. Applicable requirements of permit MD-1008A2 include: limit turbine and engine configuration at the facility to four Cooper Bessemer GMWC-6 engines, one Solar Centaur 50 T-6100S turbine, one Caterpillar 3804SI engine, and one Caterpillar 3512SITA engine; limit the Caterpillar 3512SITA engine to 499 hp; limit of 500 operating hours per year and maintain hour meter for the Caterpillar 3408SI engine; emission limits for NO_x and CO in terms of g/hp-hr, lb/hr and TPY for all compressor and generator engines at the facility; annual NO_x and CO emissions monitoring of both Caterpillar 3512SITA generator engines; NSCR and air/fuel ratio controls on the Caterpillar 3408SI engine shall be maintained in accordance with the manufacturer's specifications and conduct NO_x and CO emissions monitoring every two years; and comply with all applicable requirements of 40 CFR Part 60, Subpart ZZZZ. MD-1008A2 supersedes specific conditions of MD-863 and all previously issued Chapter 6, Section 2 waivers and permits, with the exception of one condition in MD-427A.

Division letter (4/19/2012): supersedes and streamlines the reporting requirements from MD-427A, MD-863 and MD-1008A2. Applicable requirements include submitting notifications for scheduled test dates to the Division at least 15 days prior to testing, and submitting test results to the Division within 45 days of completing the tests.

Applicable Requirements:

In addition to the permit requirements listed above, the sources at the facility are subject to the visible emission limits set forth in WAQSR Ch 3, Sec 2. Visible emissions from the Cooper Bessemer GMWC-6 engines and the miscellaneous catalytic heaters are limited to 40 percent opacity and all other units at the facility are limited to visible emissions of 20 percent.

WAQSR Ch 3, Sec 3 limits NO_x emissions from new fuel burning equipment to 0.20 pounds per MMBtu heat input. This limit applies to the Sellers C-80-W boiler and the Sivalls fuel gas line heater. NO_x emissions from the existing fuel burning equipment, miscellaneous catalytic heaters, are limited to 0.23 pounds per MMBtu heat input.

This facility is subject to the requirements of 40 CFR Part 60, Subpart GG, for *Stationary Gas Turbines*. Subpart GG limits the NO_x and SO₂ emissions from the Solar Centaur 50 T-6100S. Permit MD-863 requires a more stringent NO_x emission limit.

The permittee must comply with any applicable requirements from Ch 5, Sec 2 New Source Performance Standards, and 40 CFR Part 60, Subpart JJJJ - *Stationary Spark Ignition Internal Combustion Engines*. (Affected engines are defined at §60.4230 of the subpart). Currently, engines at the facility do not have

any requirements under Subpart JJJJ. However, as required by the temporary engine replacement condition of the operating permit, if an engine is replaced or reconstructed, subpart applicability will need to be reevaluated and a statement regarding applicability submitted to the Division.

This facility is subject to 40 CFR Part 63, Subpart DDDDD, for *Industrial, Commercial and Institutional Boilers and Process Heaters*. The Division is in the process of removing WAQSR Ch 5 Sec 3 Subpart DDDDD, as published in the Federal Register September 13, 2004, from the state regulations. Upon completion of this process, the state rule will no longer apply. However, the permittee is subject to the most recent Part 63 version of Subpart DDDDD. Affected units include the Sivalls Fuel Gas Line heater and the Sellers C-80-W boiler.

The combustion turbine at this facility is subject to the provisions of 40 CFR Part 63, Subpart YYYY, for *Stationary Combustion Turbines*, but has no applicable requirements. Northwest Pipeline Corporation reported that a non-cancelable purchase order was issued to Solar Turbines in September of 2002 for the Solar Centaur 50 T-6100S turbine, thus the turbine is considered existing under the requirements of Subpart YYYY.

40 CFR 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines applies to all non-turbine engines at the facility.

Periodic Monitoring

For periodic monitoring of visible emissions from all sources, the permittee shall monitor the type of fuel used to ensure natural gas is the sole fuel source. Periodic monitoring from the four Cooper Bessemer compressor engines shall consist of quarterly or semiannual NO_x emissions testing and annual CO emissions testing. Periodic monitoring from the Solar Centaur 50 T-6100S turbine and the Caterpillar 3512STA generator engines shall consist of annual NO_x and CO emissions testing. Periodic monitoring from the Caterpillar 3408SI generator engine shall consist of biennial NO_x and CO emissions testing as well as monitoring of the operating hours. For NO_x and CO emissions testing from the compressor and generator engines, the permittee shall use the Division's portable analyzer monitoring protocol or EPA reference methods.

The natural gas fired Sellers C-80-W boiler and the Sivalls fuel gas line heater are limited to 0.20 pounds per MMBtu heat input. The miscellaneous catalytic heaters are limited to 0.23 pounds per MMBtu heat input. These sources are fuel burning equipment as defined in WAQSR Ch 1, emitting less than 5 tons per year (TPY) oxides of nitrogen (NO_x). In the absence of more stringent permit limits for these sources, the NO_x emission limit for fuel burning equipment defaults to 0.20 pounds per million BTUs (lb/MMBtu) for sources constructed after April 9, 1973, and 0.23 pounds per MMBtu for existing sources, as stated in WAQSR Ch 3, Sec 3 emission standards for nitrogen oxides. These regulatory limits have not been updated since 1973. Generally, these small fuel burning sources are uncontrolled and operate at a steady state; emission variations are not likely. The AP-42 emission factors were developed by the EPA to help estimate the quantity of a pollutant from a given source type. In developing an AP-42 emission factor, emission data is averaged from sources of similar size and type and is then assigned a reliability rating based on quality and quantity of the data used. The rating scale runs from A to E, with an A rating providing the highest quality. The AP-42 emission factor for gaseous fuel burning sources less than 100 MMBtu/hr is 0.1 lb/MMBtu with a B rating. Considering the amount of data evaluated to develop the AP-42 emission factor, the Division feels it is extremely unlikely these sources will operate out of compliance and considers further monitoring of these sources uneconomical.

