

STATEMENT OF BASIS

To: Reviewers

Through: Dan Olson, Administrator
Michael Stoll, Operating Permit Program Manager

From: Kurt Smith P.E, Air Quality Engineer

Subject: Draft Operating Permit 30-149-2 or Frontier Refining Inc., Cheyenne Refinery

Date: January 24, 2006 (**April 26, 2006 Addendum**)

Attached for your review is a draft Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 6, Section 3 operating permit modification for the Frontier Refining Inc., Cheyenne Refinery. The Division issued Operating Permit 30-149 on January 21, 2003 and the Division issued the first operating permit modification for the facility (30-149-1) on November 26, 2003. Below is a description of the recent permitting history and a summary of how and whether the equipment and conditions are incorporated into the 30-149-2 operating permit modification.

10/9/2002 Waiver (AP-0195): was issued to allow the temporary (30 days) installation of six portable diesel engines to allow repairs of the FCCU main air blower rotor. No requirements from the waiver remain in effect and the operating permit modification does not address the waiver.

Permit MD-839 (12/23/2002): was issued to allow construction of one additional storage vessel (Tank 2-34A) and a change of service for two other storage vessels. The permit states that the permittee shall comply with all applicable requirements of 40 CFR 60 Subpart Kb and 40 CFR 63 Subpart CC. The tank and 40 CFR 60 Subpart Kb and 40 CFR 63 Subpart CC requirements are added to the operating permit modification.

2/11/2003 Waiver (AP-0437): was issued to modify operations at the refinery by the addition of a 150 horsepower Caterpillar 3056 diesel fired water pump engine. The pump is used to route water from the waste-water treatment facility to Porter Draw. The waiver is superseded by the 10/14/03 waiver.

8/5/2003 Waiver (AP-0935): was issued to modify operations with the routing of the sulfur pit #1 and sulfur pit #2 eductor vents to the sulfur incinerator. The waiver contains no requirements and the operating permit modification does not address the waiver or eductor vents.

Permit MD-927 (9/9/2003): was issued to allow for the increase in the firing rates of the crude charge heater and the vacuum charge heater (units 21 and 22) at the facility. The permit set emission limits for SO₂, NO_x, and CO for the heaters. The permit required performance testing for NO_x and CO emissions from both heaters, within 90 days of permit issuance. The crude charge heater (unit 21) is required to be tested annually for NO_x and CO emissions, either using reference method testing or the portable analyzer protocol. The new equipment and requirements from MD-927 were included in previous operating permit modification (30-149-1). Permit MD-927 was amended by permit MD-927A.

10/14/03 Waiver (AP-1186): was issued to adjust emission limits for the 150 horsepower Caterpillar 3056 diesel fired water pump engine. The waiver limits operating of the engine to 4000 hours per year. The permittee must also document that the engine is maintained in accordance with the manufacturer's recommendations. Initial performance testing of the engine has been completed. The engine and requirements are added to the operating permit modification.

Permit MD-927A (11/5/2003): was issued to amend MD-927 to change the method of calculating the daily charge rate for the Crude Unit and to change the due date of the charge rate report from the 15th to the 30th of each month. No changes in emission were made by the amendment. All new equipment and requirements from MD-927 and MD-927A were included in previous operating permit modification (30-149-1) and no additional modifications to the operating permit related to MD-927 or MD-927A are needed or included in the current operating permit modification.

12/23/2003 Waiver (AP-1476): was issued to allow installation of two temporary boilers to provide steam while the CO Boiler is down for emergency repair or replacement due to refractory and structural damage and while the Hydrogen Plant is down for turnaround. The boilers will be gas fired, limited to 90 MMBtu/hr each, and used for a period not to exceed 24 weeks. The waiver was extended for a period of 13 weeks on 4/19/04. The 12/23/2003 waiver has expired and the operating permit modification does not address the waiver.

1/26/2004 Waiver (AP-1570): was issued to allow replacement of the Coker A Heater (unit 23) which was damaged in a fire. The new unit is rated at 40.3 MMBtu/hr and is referred by the same name and unit ID as the old unit. The waiver stated that all requirements for the previous heater under permit 30-149-1 would apply to the replacement heater. This waiver was superseded by the waiver issued on 8/10/04.

4/19/2004 Waiver (AP-1804): was issued to allow a 13 week extension for two temporary gas fired boilers originally waived under the 12/19/2003 waiver. The 4/19/04 waiver has expired and the operating permit modification does not address the waiver.

MD-1021 (6/28/2004): was issued to allow modification of the loading dock by constructing a third loading bay and installing new loading arms, upgrading pipes and pumps, installing a new control system including video surveillance, and adding additional spill containment and a firewater deluge system for all three loading bays. The new loading rack bay and upgraded facilities started up on May 8, 2005 and were performance tested on June 29, 2005.

8/10/2004 Waiver (AP-2223): was issued to adjust the NO_x emission limits on the Coker A Heater waiver under the 1/26/04 Waiver. Testing required by the 1/26/04 waiver was already completed on 6/2/04 and no additional testing is required by the 8/10/04 waiver (only the emission limits were raised under the new waiver.) The new emission limits are updated in the operating permit modification.

A **Consent Decree (Civil No. 165-358)** was filed in the First Judicial District Court in and for Laramie County, State of Wyoming on **February 14, 2005**. NOV Docket No. 3411-02, 3485-03, 3535-04, and 3557-04 were settled and the permittee agreed to civil penalties and supplemental environmental projects (SEPs). Section V.C of the 165-358 Consent Decree requires implementation of the Alky CBM Pit Neutralization Upgrade SEP. The Alky CBM Pit Neutralization upgrade must be completed by September 30, 2005. Issues related to NOV 3411-02 were deemed to have been satisfied under Section V.D of the 165-358 Consent Decree; permit MD-927 has already been issued as a result of the NOV. Section V.E.1 of the 165-358 Consent Decree requires a remote UV flare pilot monitoring system be installed as a backup to the thermocouple system; this has been completed and the startup date of the UV flare pilot monitoring system was August 26, 2003. Section V.E.2 requires that H₂S be removed from the Coker blowdown gases routed to the Coker flare. The consent decree required startup by December 31, 2005. Section V.E.3 details permitting requirements and mandates the Coker flare requirements specified in the consent decree under Section V.E.2 be included in the WAQSR Chapter 6, Section 3 operating permit. Under Section V.E.3, the "Odor Control Program" requirements contained in permit 30-149-1 will be incorporated into the required preconstruction permit (MD-1176), but under Section VI.C.1 the parties will file a motion and order to terminate the 1992 Consent Decree (Docket No. 130-371), dated July 10, 1992.

MD-1115 (2/24/2005): was issued to modify operations by retrofitting eight existing heaters with low-NO_x burners and increasing their firing rates in order to produce ultra low sulfur diesel (ULSD) and allow increased throughputs through the Unifiner, Reformer, and Hydrobon units. MD-1115 consolidated process rate / charge rate reporting requirements for the crude, coker, Unifiner, FCC, and sulfur recovery units at the facility. The permit allows modification options on several heaters. Unit 50 is now permitted to fire refinery fuel gas, but was not otherwise modified. Units 10, 12, 14, 15, 16, and 18 have been or will be modified with installation of low NO_x burners. Units 10, 14, 15, 16, and 18 started up on March 7, 2005 and were performance tested on June 14-16, 2005. The operating permit specifies initial performance testing and reporting requirements for unit 12. Units 13 and 17 are not being modified by the permittee and the option to modify these heaters is not placed into the operating permit. MD-1115 specified emission limits if unit 17 was not ultimately modified under permit MD-1115. Permit MD-1115 does not specify what SO₂ emission limitations would apply to unit 13 if no modification of unit 13 takes place. Permit MD-1115 was issued based upon a net emissions change that was below, but near, the Prevention of Significant Deterioration (PSD) significance threshold for SO₂ emissions. Since permit MD-1115 considered the reduction of SO₂ emissions from unit 13, and such reduction was necessary for netting purposes, the new SO₂ emission limit listed in permit MD-1115 for this source is valid and is incorporated into the operating permit. The Unifiner Charge Heater (unit 11) will be replaced; the operating permit incorporates only this possibility and does not include an additional option allowed under MD-1115 for installation of low NO_x burners in the existing unit.

6/15/05 Waiver (AP-3449): was issued to allow installation of a 525 hp Caterpillar 3406E DITA diesel backup air compressor at the refinery. By condition of the waiver, the engine is limited to 2160 hours of operation per year. The permittee is also required to maintain the engine as recommended by the manufacturer of supplier. The engine has been installed.

MD-1176 (7/1/2005): was issued to allow an increase in crude distillation rate to 52,000 barrels per day, with no physical modifications associated with the increase. The permit also incorporated the Consent Decree (Civil No. 165-358) as described above and specified that the coker flare must meet 40 CFR 60 Subpart J requirements limiting emissions of sulfur from fuel gas fired sources as they relate to the Coker flare. The facility does not intend to routinely route emissions to the Coker flare and is installing equipment to process the Coker off-gasses.

7/22/05 Waiver (AP-3585): was issued to allow installation of a skid mounted truck unloading station with a maximum crude unloading capacity of 400 gallons per minute. Emissions due to the new truck unloading station are estimated at 1.3 TPY VOC and 0.01 TPY HAP due to fugitive emissions from new piping components and increased throughput of the Sour Crude Tank (Tank 2-074). No additional emissions at other emission units were expected beyond those considered under MD-1176, because the crude throughput to the refinery is limited to 52,000 barrels per day by MD-1176. The waiver contains no applicable requirements.

Additional Applicable Requirements

A number of NESHAP standards have been promulgated since issuance of the current Frontier operating permit. Subpart EEEE for Organic Liquids Distribution may have limited applicability to the facility. In a letter submitted to the Division by Frontier on May 16, 2005, a demonstration was given that none of the storage vessels, transfer racks, or equipment leak components at the facility are subject to Subpart EEEE. The affected source under Subpart EEEE also includes "all transport vehicles while they are loading or unloading organic liquids at transfer racks" (§63.2338(b)(4)). It is unclear in the subpart or the preamble whether transport vehicles loading or unloading organic liquids at transfer racks that are subject to a different NESHAP standard (in this case, Subpart CC) are subject to Subpart EEEE. Because of this ambiguity, Subpart EEEE has been added to the permit as an applicable requirement. The facility is also an affected source under 40 CFR 63 Subparts ZZZZ (Reciprocating Internal Combustion Engines) and DDDDD (Boilers and Process Heaters).

The facility is subject to 40 CFR 61 Subparts A and FF. After the initial operating permit was issued, the facility recalculated benzene emissions and discovered that benzene emissions were greater than 1 TPY. This potentially makes the facility subject to additional standards and requirements under 40 CFR 61 Subparts A FF. Therefore, 40 CFR 61 Subparts A and FF requirements have been added to the operating permit.

Frontier has had actual emissions of SO₂ in excess of 100 tpy and is therefore subject to the emissions inventory requirements of WAQSR Chapter 14.

Description of Permit Changes

The following information and conditions are being modified in operating permit 30-149-2 to reflect the newly constructed equipment (Tank 2-34A, the Porter Draw Diesel Water Pump Engine, and the Caterpillar 3406E DITA diesel backup air compressor) and to update and add requirements from the previously described construction permits, waivers, and new applicable requirements. Other

changes make the permit consistent with other Chapter 6, Section 3 operating permits currently being issued by the Division. Permit revisions include:

- The Table of Contents and General Information sections are updated.
- The Source Emissions Points table is updated to acknowledge the August 10, 2004 waiver for the Coker A heater (unit 23), add the Porter Draw Diesel Water Pump Engine (unit 78) and the Caterpillar 3406E DITA diesel backup air compressor engine (unit 79), and change permit references. In the Source Emissions Points table and throughout the permit, the names of the Reformer heaters have been changed from the #1, #2, #3, and #4 reformers, to the Reformer Charge Heater and the #1, #2, and #3 Reformer Interheaters. The sizes of various heaters and reboilers were updated to reflect changes authorized by permit MD-1115.
- The Total Facility Estimated Emissions table is updated.
- Visible emission requirements for the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E DITA diesel backup air compressor engine are added to condition F3.
- Condition F4 is updated to clarify that operation of the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E DITA diesel backup air compressor engine is not restricted to gas firing. Condition F4 (b) is added to allow operation of equipment which is not fired on refinery fuel gas or pipeline quality gas, provided firing the fuel is permitted under WAQSR Chapter 6, Section 2.
- Condition F5 and Table I are updated to include the emission limits from MD-1115 and MD-1176.
- Conditions F7 and F8 and Table II are updated to include the emission limits from MD-1115 and the August 10, 2004 waiver. In accordance with permit MD-1115, the CO emissions limits for units 22 and 69 are removed from Table II.
- Operating and maintenance requirements of the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E backup air compressor engine are added to condition F9. The wastewater requirements are now included in permit MD-1176, so reference to MD-1176 is added.
- Condition F10 is altered to include the crude rate limit from permit MD-1176.
- Condition F11 is added to the permit to include the VOC emission limit for the vapor recovery unit (VRU) controlling the loading dock. Previously construction permits did not limit VOC emissions from the loading rack on a TPY basis. Under MD-1021, VOC emissions are limited to 5.5 TPY in addition to the limit under 40 CFR 63 Subpart CC of 10 mg per liter of gasoline loaded.
- Condition F12 is added to include construction authorization limitations and startup notification requirements.
- Since emissions will not be routed to the flare after December 31, 2005, condition F13 has been deleted.

- The requirement to conduct initial performance testing of the Crude Charge Heater and Crude Vacuum Heater are been left in the permit (conditions F15 and F16). The tests which were submitted by the permittee were old tests conducted in 2002; the Division has not acknowledged the appropriateness of the tests submitted.
- Initial testing requirements in conditions F15 and F16 are updated to include the Unifiner Charge Heater (unit 11) and Unifiner Reboiler (unit 12).
- Condition F19 (a) is altered to require that the COM on the FCCU stack be used for visible emissions monitoring instead of the twice daily visual observations. Per 40 CFR 63 Subpart UUU, a continuous opacity monitor was required on the stack no later than April 11, 2005.
- Visible emission monitoring requirements for the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E DITA diesel backup air compressor engine are added to condition F19. The requirement to monitor the flare with a back up UV pilot monitor is added to condition F19 (d). The back up UV pilot monitor was established in accordance with the compliance schedule submitted by the permittee on March 10, 2003 and acknowledged in the Consent Decree (Civil No. 165-358) filed on February 14, 2005.
- Condition F21 is altered to include the Sulfur Incinerator and 40 CFR 60 Subpart J monitoring requirements from MD-1115.
- Condition F24 is altered to specify that the continuous CO monitor will be used as periodic monitoring for CO emissions from the Fluidized Catalytic Cracking Unit.
- Operating hour monitoring requirements for the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E DITA diesel backup air compressor engine are added to condition F26. Condition F26 also is updated to specify “monitoring” requirements for the cleaning events conducted on the FCCU Waste Heat Exchanger. The permit did not previously list these activities under the monitoring section of the permit, although records were required under the recordkeeping section. This change is designed to allow uniformity in tracking for both the Division and the permittee and does not add to or otherwise significantly alter existing requirements for the FCCU Waste Heat Exchanger.
- Condition F27 is added to indicate that VOC monitoring on the VRU follows the requirements of 40 CFR 63 Subpart CC. The condition also specifies how annual VOC emissions from the VRU are to be calculated.
- Condition F31 is altered to specify the reference to condition F26 (a).
- Condition F32 is updated to include records which need to be kept in addition to the continuous emission records required under 40 CFR 60 Subpart J.
- Recordkeeping requirements for the pilot flare monitoring, which were not included in the previous operating permit, are added in condition F33. Recordkeeping is also added for the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E backup air compressor engine.
- The requirement to keep records of charge rates is now specified in permit MD-1176, so reference to this is added to condition F34.

- Condition F35 is added to specify records which need to be kept for VOC emissions from the VRU at the truck loading rack.
- Condition 38 is updated to refer to all visible emission monitoring requirements. Condition F38 is also updated to remove reference to the Method 9 monitoring reports of the FCCU. Excess opacity reports for the FCCU Regenerator now comply with P63-UUU1 and P63-UUU6. (See the comment for condition F41.)
- Conditions F39 and F40 are updated to include notification and reporting requirements for performance tests for units 11 and 12.
- Condition F41 is updated to indicate excess opacity reports for the FCCU Regenerator shall comply with Subpart UUU, and to include the reporting requirements from MD-1115 which are in addition to those required under 40 CFR 60 Subpart J.
- Maintenance and operating hour reporting for the Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E backup air compressor engine is added to condition F42. Flare pilot monitoring reports are now also included in condition F42.
- Condition F43 is updated to the unified process rate reporting requirements from permits MD-1115 and MD-1176.
- Condition F44 is added to require reporting of annual VOC emission from the Truck Loading Rack VRU. Monitoring, recordkeeping, reporting requirements for the unit were previously only specified under condition P63-CC1. The additional report under condition F44 is now required since the VRU now has the 5.5 TPY VOC limit set by WAQSR Chapter 6, Section 2 permit MD-1021.
- Sulfur Dioxide Emissions Inventory Requirements are added at the end of the Facility-Specific Permit Conditions as conditions F49 through F51.
- The origin of the Odor/VOC control conditions (ODOR-1 through ODOR-4) is updated to reference Permit MD-1176.
- 40 CFR 60 Subpart J requirements for the heaters modified under permit MD-1115, the Scanfiner Reactor Preheater Furnace (unit 69), and the flares are added to the permit. Excess emissions include the lb/hr and TPY SO₂ limits from permit MD-1115 and MD-1176 for the Sulfur Incinerator.
- Condition F60-GGG1 is updated to include 40 CFR 60 Subpart GGG requirements for the Loading Rack and associated equipment modified under permit MD-1021.
- The Subpart QQQ requirements are updated to include reference to the Gasoline Desulfurization Unit and permit MD-798, which was missed in the initial permit.
- 40 CFR 60 Subpart Kb requirements for newly constructed tank 2-34A are added to the permit. The tank is also added as a 40 CFR 63 Subpart CC Group 1 Storage Vessel in Appendix H and to the table of storage vessels in Appendix L. Note that 40 CFR 63.640 (n)(1) states that group 1 storage vessels which are also subject to 40 CFR 60 Subpart Kb and are part of an existing source shall only comply with 40 CFR 60 Subpart Kb. While the tank is newly constructed, it is part of an existing source as defined for 40 CFR 63 Subpart

CC. Consequently, the tank has been added to footnote (b) of the Group 1 Storage Vessels table in the Subpart CC Equipment List, Appendix H of the operating permit. The footnote indicates that the tank is subject to 40 CFR 60 Subpart Kb but is exempt from the 40 CFR 63 Subpart CC requirements.

- 40 CFR 61 Subparts A and FF – National Emission Standards for Benzene Waste Operations is added to the permit. Subpart FF applies to the facility, but the facility is exempt from certain requirements of the rule because benzene emissions from the affected sources are less than 10 megagrams per year.
- Condition P63-CC1 is updated to specify that the Subpart CC equipment list attached as Appendix H contains process vents, storage tanks, and facility wastewater streams. This additional wording was added so that the absence of fugitive equipment leaks, loading racks, and flares (listed in condition P63-CC1 (d), (e), and (f)) is not misinterpreted to mean that the facility does not have any of these affected sources.
- Requirements from three recently published National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations are added to the operating permit. These are the NESHAPs for Organic Liquids Distribution (OLD), Reciprocating Internal Combustion Engines (RICE) and Industrial/ Commercial/Institutional Boilers & Process Heaters; 40 CFR 63 Subparts EEEE, ZZZZ and DDDDD, respectively.
- Compliance certification with the visible emission limitation, hours of operation, and maintenance requirements for the Porter Draw Diesel Water Pump Engine and Caterpillar 3406E DITA diesel backup air compressor engine is added to condition C1 (b).
- Compliance certification for SO₂ from the Coker Flare in C1(b) is revised to refer to the monitoring requirements of F21.
- Minor typographical errors have been corrected and the sections in C1(b) are organized in the order in which they appear in as conditions in the permit. Statements were added to certify compliance with the CO limit for the FCCU regenerator and the VOC limit for the new truck loading rack.
- Compliance certification requirements in condition C1 (b) are updated to include the new equipment and add certification with the requirements of 40 CFR 61 Subpart FF and 40 CFR 63 Subparts EEEE, ZZZZ and DDDDD.
- Condition G19, Open Burning Restrictions, is updated to reflect requirements in the recently revised WAQSR Chapter 10. Condition G25 is added to include Sulfur Dioxide Emission Trading and Inventory Program requirements.
- The Scanfiner Reactor Preheat Furnace (unit 69) is added to the appropriate Summary of Source Emission Limits and Requirements table and a new summary table is added for the new Porter Draw Diesel Water Pump Engine and the Caterpillar 3406E backup air compressor engine. The NESHAP requirements are also added to the Summary of Source Emission Limits and Requirements tables. The tables are also updated as necessary to include changes to the emission limits, monitoring, and reporting requirements contained in the source specific permit conditions.

- The Abbreviations list is updated.
- Corrections are made to Appendix H describing tanks 2-103 and 2-67 and corrections are made describing the service for tanks 2-100 and 2-104 in both Appendix H and Appendix L.
- The coker flare testing procedures previously contained in Appendix M has been removed, since the coker flare no longer controls emissions from the coker unit.
- 40 CFR 63 Subparts EEEE, ZZZZ, and DDDDD are added as Appendices P, Q and R. 40 CFR 61 Subpart FF is added as Appendix S. Previously existing appendices, except for H and L, remain unchanged, except that 40 CFR 60 Subparts GGG, VV, Db, Ka, Kb; 40 CFR 61 Subparts A and FF; and 40 CFR 63 Subparts CC and UUU have been updated to the latest version of these regulations.

Addendum – (April 26, 2006)

After receiving comments during the initial public notice period for this operating permit, the operating permit is being updated to include the amendments of WAQSR Chapter 6, Section 2 permit MD-1115A, issued February 21, 2006, and make other changes to the operating permit. Each additional change is detailed below:

- **A revision to the alternate responsible official has been made to the permit.**
- **The process description in the permit has been modified per Frontier's request.**
- **The newly revised firing rate has been specified for the Unifiner Charge Heater in the Source Emissions Point Table.**
- **The Source Emissions Point Table now states that size descriptions come from permit applications submitted by Fronter.**
- **The revised emission limits for the Unifiner Charge Heater and the Unifiner Reboiler from the recently modified construction permit, MD-1115A have been added to the permit. This change required the second public notice.**
- **Monitoring requirements for the Coker Flare have been changed to reflect it's revised use as a control device used during upset conditions.**
- **Appendix H was modified to remove three process vents at the Coker Unit which were eliminated due to process changes at the Coker Unit and the Alkylation Unit.**
- **A revised Sulfur Contingency Plan was placed in Appendix J of the permit. An earlier, outdated plan had been place in the initial draft version of this modified permit.**
- **References to MD-1115 were updated to MD-1115A throughout the permit.**
- **The general conditions of the permit were updated to include recent revisions to Chapter 1, Section 5 of Wyoming Air Quality Standards and Regulations.**

- **The one hour ozone standard which is no longer the ambient standard for ozone has been removed from the draft permit.**