July 7, 2022

Ron Colwell
Montana Renewables LLC
MRL Great Falls Renewable Fuels Plant
1900 Street NE
Great Falls, Montana 59404

Sent via email to: Ron.Colwell@calumetspecialty.com

RE: Final Permit Issuance for MAQP #5263-01

Dear Mr. Colwell:

Montana Air Quality Permit (MAQP) #5263-01 is deemed final as of July 7, 2022, by DEQ. As this is considered an Energy Development Project, the appeal period ends on July 21, 2022. This permit is for Montana Renewables LLC for a renewable fuels plant. All conditions of the Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For DEQ,

Julie A. Merkel
Permitting Services Section Supervisor
Air Quality Bureau
(406) 444-3626

Craig Henrikson, P.E.
Environmental Engineer
Air Quality Bureau
(406) 444-6711

Enclosures

Montana Department of Environmental Quality
Air, Energy & Mining Division
Air Quality Bureau

Montana Air Quality Permit #5263-01

Montana Renewables LLC
1900 Street NE
Great Falls, Montana 59404

July 7, 2022

MONTANA AIR QUALITY PERMIT

Issued to: Montana Renewables LLC
1900 Street NE
Great Falls, Montana 59404

MAQP: #5263-01
Application Received: April 26, 2022
Application Complete: May 19, 2022
Preliminary Determination: May 26, 2022
Department's Decision: June 21, 2022
Permit Final: July 7, 2022

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Montana Renewables LLC. (MRL) pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

Section I: Permitted Facilities

A. Plant Location

The legal description of the site is the Northeast (NE) quarter of Section 1, Township 20 North, Range 3 East in Cascade County, Montana. The new renewable fuels plant would sit on the site currently occupied by the Montana Calumet Refinery. A map of the site is included in the Environmental Assessment attached to this permit.

B. Current Permit Action

On April 26, 2022, the Department of Environmental Quality (DEQ) received an application to modify MAQP #5263-00. Since the initial MAQP was issued on October 26, 2021, construction has begun for the new facility but the original design details have evolved to accommodate the latest project plan. The application has been submitted under the name Renewable Feed Flexibility Project. The primary change in the plant design entails installing a pretreatment unit (PTU) to allow the facility to treat raw renewable materials such as fats and oils which will result in the need to handle and transfer additional wastewater from the facility. This additional wastewater generation will require an additional storage tank as well as load-out facilities that use trucks, existing rail load-out infrastructure, or the installation of new rail load-out facilities. Finally, renewable kerosene and sustainable aviation fuel are also being added as renewable products produced at the facility. These two new planned products will require new tanks as well as changes in the planned use of other tanks. MRL also proposed to permit the MHC Fractionator Feed Heater (H-4102) which had earlier been planned for shutdown, and will now be called the RDU Fractionator Feed Heater (H-4102). Additional process equipment is also being permitted and is described in the MAQP analysis.

Section II: Conditions and Limitations

A. Emission Limitations

1. RDU Combined Feed Heater (H-4101)

a. NOx emissions shall not exceed 0.035 lb/MMBtu (Higher Heating Value) (HHV) on a 30-day rolling average basis using ultra-low NOx burners (ULNBs) and monitored via CEMS including an O_2 analyzer and NOx analyzer (ARM 17.8.752 and ARM 17.8.749).

b. MRL shall use good combustion practices and an oxygen monitoring system to control CO emissions which may not exceed 0.055 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

c. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize PM (ARM 17.8.752 and ARM 17.8.749).

d. PM (filterable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

e. PM_{10} (filterable plus condensable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

f. $PM_{2.5}$ (filterable plus condensable) emissions shall not exceed 0.00042 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

g. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize volatile organic compounds (VOCs) (ARM 17.8.752 and ARM 17.8.749).

h. The annual average firing rate of H-4101 shall not exceed 25 MMBtu/hr (HHV) (ARM 17.8.752 and ARM 17.8.749).

i. MRL shall conduct the work practice standards for minimizing CO required under 40 CFR 63 Subpart DDDDD (40 CFR 63 Subpart DDDDD, ARM 17.8.749 and ARM 17.8.342).

j. H-4101 shall only combust natural gas and RDU off-gas (ARM 17.8.749).

k. H-4101 shall not combust RDU off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust RD off-gas fuel containing H_2S in excess of 10 ppmv on an annual average basis (ARM 17.8.749.)

l. Opacity shall not exceed 20% averaged over any 6 consecutive minutes (ARM 17.8.304)

2. Hydrogen Plant #3 - Reformer Heaters (H-3815A and H-3815B)

    a. The annual average firing rate of each heater (H-3815A and H-3815B) shall not exceed 67.0 MMBtu/hr (HHV) (ARM 17.8.749).

    b. NOx emissions from each heater shall be controlled by an ULNB and the combined NOx emissions from the two heaters shall not exceed 0.051 lb/MMBtu (HHV) on a 30-day rolling average basis and monitored via CEMS including an O_2 analyzer and NOx analyzer (ARM 17.8.752 and ARM 17.8.749).

    c. MRL shall control PM (filterable), PM_{10} (filterable plus condensable) and $PM_{2.5}$ (filterable plus condensable) emissions from each heater by utilizing good combustion practices and only combusting low sulfur fuels (ARM 17.8.752 and ARM 17.8.749):

        i. PM (filterable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average.

        ii. PM_{10} (filterable plus condensable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average.

        iii. $PM_{2.5}$ (filterable plus condensable) emissions shall not exceed 0.00042 lb/MMBtu (HHV) on a 1-hour average.

    d. MRL shall control CO emissions using good combustion practices and CO emissions shall not exceed 0.03 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

    e. Opacity shall not exceed 20% averaged over any 6 consecutive minutes (ARM 17.8.304).

    f. H-3815A and H-3815B shall only combust natural gas and PSA off-gas, which are inherently low sulfur fuels (ARM 17.8.749).

3. Hydrogen Plant #4 (H-4801). MRL shall comply with the following requirements:

    a. NOx emissions shall be controlled by an ULNB and shall not exceed 0.04 lb/MMBtu (HHV) on a 30-day rolling average basis and monitored via CEMS including an O_2 analyzer and NOx analyzer (ARM 17.8.752 and ARM 17.8.749).

    b. MRL shall use good combustion practices and a continuous oxygen monitoring system to control CO emissions which may not exceed 0.03 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

c. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize PM (ARM 17.8.752 and ARM 17.8.749).

d. H-4801 shall not combust PSA off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust PSA off-gas fuel containing H_2S in excess of 10 ppmv on an annual average basis (ARM 17.8.752 and ARM 17.8.749).

e. H-4801 shall not combust RDU off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust RDU off-gas in fuel containing H_2S in excess of 10 ppmv on an annual average basis (ARM 17.8.749 and ARM 17.8.752).

f. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize VOCs (ARM 17.8.752 and ARM 17.8.749).

g. The annual average firing rate of H-4801 shall not exceed 213 MMBtu/hr (HHV) (ARM 17.8.749).

h. MRL shall comply with 40 CFR 63 Subpart DDDDD which requires the process heater to undergo a tune-up every five years, as specified in 40 CFR 63. 7540 (40 CFR 63, Subpart DDDDD, ARM 17.8.342 and ARM 17.8.749).

i. H-4801 shall only combust natural gas, PSA off-gas and RDU off-gas (ARM 17.8.749).

j. Opacity shall not exceed 20% averaged over any 6 consecutive minutes (ARM 17.8.304).

4. New Tanks #301, #302, #303, #304, #305, #306, #307, #308, #309, #0801, and #4201

   a. MRL shall control VOC emissions from Tank #301, #302, #303, #305, #306, #307, #308, #309 and #0801 by equipping each tank with a fixed roof and submerged fill design (ARM 17.8.752 and ARM 17.8.749).

   b. MRL shall control VOC emissions from Tank #304 by equipping it with an external floating roof (ARM 17.8.752 and 40 CFR 60, Subpart Kb, ARM 17.8.340 and ARM 17.8.749).

   c. MRL shall control VOC emissions from Tank #4201 by equipping it with a carbon adsorption control device (ARM 17.8.749 and ARM 17.8.752).

   d. Tanks #301, #302 and #303 shall only be used to store renewable feed or an equivalent material with equal or lower vapor pressure (ARM 17.8.749).

e. Tank #304 shall only be used to store renewable naphtha or an equivalent material with equal or lower vapor pressure (ARM 17.8.749).

f. Tank #305 shall only be used to store renewable diesel or an equivalent material with equal or lower vapor pressure (ARM 17.8.749).

g. Tanks #306 and #307 shall only be used to store renewable kerosene or an equivalent material with equal or lower vapor pressure (ARM 17.8.749).

h. Tanks #308 and #309 shall only be used to store renewable kerosene or sustainable aviation fuel or an equivalent material with a vapor pressure equal or lower than the highest vapor pressure of renewable kerosene and sustainable aviation fuel (ARM 17.8.749).

i. Tank #0801 shall only be used to store conventional diesel (ARM 17.8.749).

j. Tank #4201 shall only be used to store wastewater produced by the PTU (ARM 17.8.749).

5. Hot Oil Expansion Tank (D-4203)

MRL shall utilize proper equipment design and good operating practices to minimize VOCs from the Hot Oil Expansion Tank (D-4203) (ARM 17.8.752 and ARM 17.8.749).

6. PTU Blowdown Drum (D-4208)

MRL shall utilize carbon adsorption for VOC control on the PTU Blowdown Drum (D-4208) (ARM 17.8.749 and ARM 17.8.752).

7. Tank #112 shall only be used to store renewable feed or RDU slop oil or an equivalent material with equal or lower vapor pressure (ARM 17.8.749).

8. Tanks #50 and #102 shall each be equipped with a fixed roof (ARM 17.8.752).

9. Tank #128 shall each be equipped with a fixed roof with pressure/vacuum vent and submerged fill (ARM 17.8.749 and ARM 17.8.752).

10. MRL shall utilize equipment design, and Leak Detection and Repair (LDAR) practices to control VOCs from the RDU, Hydrogen Plant #4, Storage Tanks, and PTU piping fugitive components, and PTU Wastewater Components (ARM 17.8.752 and ARM 17.8.749).

a. RDU piping fugitive components "in VOC service" shall comply with the equipment leak provisions found in 40 CFR 60.482-1a through 60.482-10a. Pursuant to NESHAP Subpart FFFF, the RDU piping fugitive components "in organic HAP service" shall comply with the new source equipment leak provisions found in 40 CFR 63.2480 (ARM 17.8.749).

b. Hydrogen Plant #4 piping fugitive components "in VOC service" shall comply with the equipment leak provisions found in 40 CFR 60.482-1a through 60.482-10a (ARM 17.8.749).

c. Storage Tank piping fugitive components "in VOC service" shall comply with the equipment leak provisions found in40 CFR 60.482-1a through 60.482.-10a. Pursuant to NESHAP Subpart FFFF, the Storage Tank piping fugitive components in "organic HAP service" shall comply with the new source equipment leak provisions found in 40 CFR 63.2480 (ARM 17.8.749).

d. PTU piping fugitive components "in VOC service" shall comply with the equipment leak provisions found in 40 CFR60.482-1a through 60.482-10a (ARM 17.8.749)

11. MRL shall follow the applicable requirements under 40 CFR 63, Subpart FFFF for all existing and new tanks depending upon whether each specific tank is in Group 1 or Group 2 (ARM 17.8.749, ARM 17.8.342 and 40 CFR 63, Subpart FFFF).

12. MRL shall utilize equipment design and equipment monitoring and maintenance practices to control VOCs from the RDU, Hydrogen Plant #4, Storage Tank, and PTU wastewater components (ARM 17.8.752 and ARM 17.8.749).

a. RDU "individual drain systems," "oil-water separators," and "aggregate facilities" shall comply with the provisions found in 40 CFR 60.692–1 through 60.692–7. The RDU wastewater components shall comply with NESHAP Subpart FF and the wastewater provisions found in 40 CFR 63.2485 of NESHAP Subpart FFFF (ARM 17.8.749).

b. Hydrogen Plant #4 "individual drain systems," "oil-water separators," and "aggregate facilities" shall comply with the provisions found in 40 CFR 60.692–1 through 60.692–7. The Hydrogen Plant #4 wastewater components shall comply with NESHAP Subpart FF (ARM 17.8.749).

c. Storage Tank "individual drain systems," "oil-water separators," and "aggregate facilities" shall comply with the provisions found in 40 CFR 60.692–1 through 60.692–7. The Storage Tank wastewater components shall comply with NESHAP Subpart FF and the wastewater provisions found in 40 CFR 63.2485 of NESHAP Subpart FFFF (ARM 17.8.749).

d. PTU "individual drain systems," "oil-water separators," and "aggregate facilities" shall comply with the provisions found in 40 CFR 60.692-1 through 60.692-7. The PTU wastewater components shall comply with NESHAP Subpart FF (ARM 1.8.749).

13. MRL shall comply with the emission control requirements of 40 CFR 63.2455 for each RDU Group 1 continuous process vent (40 CFR 63, Subpart FFFF, ARM 17.8.342 and ARM 17.8.749).

14. MRL shall comply with the monitoring requirements of 40 CFR 63.2455 for each applicable RDU Group 2 continuous process vent (40 CFR 63, Subpart FFFF, ARM 17.8.342 and ARM 17.8.749).

15. MRL shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

16. MRL shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

17. MRL shall treat all unpaved portions of the access roads with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.13 (ARM 17.8.749).

18. RDU Fractionator Feed Heater (H-4102)

    a. NOx emissions shall not exceed 0.04 lb/MMBtu (HHV) on a 1-hour average using ULNBs (ARM 17.8.752 and ARM 17.8.749).

    b. MRL shall use good combustion practices and an oxygen monitoring system to control CO emissions which may not exceed 0.055 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

    c. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize PM (ARM 17.8.752 and ARM 17.8.749).

    d. PM (filterable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

    e. PM_{10} (filterable plus condensable) emissions shall not exceed 0.00051 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

    f. $PM_{2.5}$ (filterable plus condensable) emissions shall not exceed 0.00042 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

    g. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize VOCs (ARM 17.8.752 and ARM 17.8.749).

    h. The annual average firing rate of H-4102 shall not exceed 30 MMBtu/hr (HHV) (ARM 17.8.749).

i. MRL shall conduct the work practice standards for minimizing CO and VOCs required under 40 CFR 63 Subpart DDDDD (40 CFR 63 Subpart DDDDD, ARM 17.8.749 and ARM 17.8.342).

j. H-4102 shall only combust pipeline quality natural gas and RDU off-gas (ARM 17.8.749).

k. H-4102 shall not combust RDU off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust RDU off-gas fuel containing H_2S in excess of 10 ppmv on an annual average basis (ARM 17.8.749 and ARM 17.8.752).

l. Opacity shall not exceed 20% averaged over any 6 consecutive minutes (ARM 17.8.304)

19. Hot Oil Heater (H-4201)

a. NOx emissions shall not exceed 0.02 lb/MMBtu (HHV) on a 1-hour average using (ULNBs (ARM 17.8.752 and ARM 17.8.749).

b. MRL shall use good combustion practices and an oxygen system to control CO emissions which may not exceed 0.04 lb/MMBtu (HHV) on a 1-hour average (ARM 17.8.752 and ARM 17.8.749).

c. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize PM (ARM 17.8.752 and ARM 17.8.749).

d. MRL shall utilize an oxygen monitoring system and good combustion practices to minimize VOCs (ARM 17.8.752 and ARM 17.8.749).

e. The annual average firing rate of H-4201 shall not exceed 38 MMBtu/hr (HHV) (ARM 17.8.752 and ARM 17.8.749).

f. MRL shall conduct the work practice standards for minimizing CO and VOCs required under 40 CFR 63 Subpart DDDDD (40 CFR 63 Subpart DDDDD, ARM 17.8.749 and ARM 17.8.342).

g. H-4201 shall only combust pipeline quality natural gas which is inherently low in sulfur (ARM 17.8.749 and Arm 17.8.752).

h. Opacity shall not exceed 20% averaged over any 6 consecutive minutes (ARM 17.8.304)

20. Railcar loading of renewable kerosene and sustainable aviation fuel shall utilize submerged fill loading (ARM 17.8.749 and ARM 17.8.752).

21. Truck loading and railcar loading of PTU wastewater shall utilize carbon adsorption to minimize VOC releases (ARM 17.8.749 and ARM 17.8.752).

B. Testing Requirements

1. The RDU Combined Feed Heater (H-4101) shall be tested for CO and NOx concurrently and the results submitted to the Department in order to demonstrate compliance with the emission limits contained in Section II.A.1. The initial testing shall occur within 180 days of startup of the heater after it is transferred from Calumet Montana Refining, LLC (CMR) to MRL. Test procedures shall use EPA Reference Methods 10 and 7E or equivalent, as approved by the Department (ARM 17.8.105 and ARM 17.8.106).

2. The combined emissions from Hydrogen Plant #3 Reformer Heaters (H-3815A and H-3815B) shall be tested in the common stack for CO and NOx concurrently and the results submitted to the Department in order to demonstrate compliance with the emission limits contained in Section II.A.2. The initial testing shall occur within 180 days of startup of the heaters after they are transferred from CMR to MRL. Test procedures shall use EPA Reference Methods 10 and 7E or equivalent, as approved by the Department (ARM 17.8.105 and ARM 17.8.106).

3. The Hydrogen Plant #4 Reformer Heater (H-4801) shall be tested for CO and NOx concurrently and the results submitted to the Department in order to demonstrate compliance with the emission limits contained in Section II.A.3. The initial testing shall occur within 180 days of startup of the heater. Test procedures shall use EPA Reference Methods 10 and 7E or equivalent, as approved by the Department (ARM 17.8.105 and ARM 17.8.106).

4. The RDU Fractionator Feed Heater (H-4102) shall be tested for CO and NOx concurrently and the results submitted to the Department in order to demonstrate compliance with the emission limits contained in Section II.A 17.a. The initial testing shall occur within 180 days of startup of the heater after it is transferred from CMR to MRL. Test procedures shall use EPA Reference Methods 10 and 7E or equivalent, as approved by the Department (ARM 17.8.105 and ARM 17.8.106).

5. The Hot Oil Heater (H-4201) shall be tested for CO and NOx concurrently and the results submitted to the Department in order to demonstrate compliance with the emission limits contained in Section II.A.18.a. The initial testing shall occur within 180 days of startup of the heater. Test procedures shall use EPA Reference Methods 10 and 7E or equivalent, as approved by the Department (ARM 17.8.105 and ARM 17.8.106).

6. MRL shall sample and analyze the concentration (dry basis) of H_2S in the Hydrogen Plant #4 PSA off-gas fuel at least once per week, in order to demonstrate compliance with the limit in Section II.A.3.d (ARM 17.8.749).

7. MRL shall sample and analyze the concentration (dry basis) of H_2S in the RDU off-gas fuel at least once per month in order to demonstrate compliance with the limit in Section II.A.1.k, II.A.3.e, and II.A.17.k.

8. The NOx and O_2 CEMS on the RDU Combined Feed Heater (H-4101), Hydrogen Plant #3 Reformer Heaters (H-31815A/H-3815B), and Hydrogen

Plant #4 Reformer Heater (H-4801) shall comply with 40 CFR 60.13- 60.19 Subpart A—General Provisions and 40 CFR 60 Appendices B and F (ARM 17.8.749).

9. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

10. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. MRL shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. MRL shall document, by month, the total MMBtu's combusted for each of the heaters (RDU Combined Feed Heater (H-4101), Hydrogen Plant #3 Reformer Heaters (H-3815A and H-3815B), Hydrogen Plant #4 Reformer Heater (H-4801), RDU Fractionator Feed Heater (H-4102), and Hot Oil Heater (H-4201), and apply the appropriate emission factors on a lb/MMBtu basis to calculate the monthly emissions. The monthly emissions information for the calendar year shall be submitted annually to the Department along with the annual emission inventory (ARM 17.8.749).

3. MRL shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit,*** change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

4. All records compiled in accordance with this permit must be maintained by MRL as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request. These records may be stored at a location other than the plant site upon approval by the Department (ARM 17.8.749).

D. Notification

MRL shall provide the Department with written notification of the following information within the specified time periods (ARM 17.8.749):

1. Startup date of the RDU Combined Feed Heater (H-4101) after it is transferred from CMR to MRL within 15 working days of the start-up date.

2. Startup date of the Hydrogen Plant #4 Reformer Heater (H-4801) within 15 working days of the startup date.

3. Startup date of the RDU Fractionator Feed Heater (H-4102) after it is transferred from CMR to MRL within 15 working days of the start-up date.

4. Startup date of the Hot Oil Heater (H-4201) within 15 working days of the startup date.

5. Startup dates of each of the new tanks #301, #302, #303, #304 #305, #306, #307, #308, #309, #0801, and #4201 within 15 working days of the startup date of each tank.

6. Date of transfer of Hydrogen Plant #3 from CMR to MRL and dates of transfer of each of the existing tanks (#29, #50, #102, #112, #116, #128 and #140) from CMR to MRL within 15 working days of transfer of each.

SECTION III: General Conditions

A. Inspection – MRL shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment such as Continuous Emission Monitoring Systems (CEMS) or Continuous Emission Rate Monitoring Systems (CERMS), or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if MRL fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving MRL of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the

Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by MRL may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit (MAQP) Analysis
Montana Renewables LLC.
MAQP #5263-01

I. Introduction/Process Description

A. Permitted Equipment

Pretreatment Unit (PTU) including

- Deaerator, liquid-liquid separator, and blowdown process vessels
- Liquid reactors
- Heat exchangers
- Filters and static mixers; and
- Piping and piping components (pumps, valves, flanges, connectors, etc.).

Hot Oil System including:

- Hot Oil Heater (H-4201)
- Hot Oil Expansion Tank (D-4203)

PTU Wastewater Handling including:

- Tank #4201
- Truck loading facility and
- Railcar loading facility (or use of existing railcar loading infrastructure transferred from Calumet Montana Refining, LLC (CMR) to Montana Renewables, LLC (MRL).

Railcar Unloading of Renewable Feedstock

Railcar Loading of Renewable Diesel, Renewable Kerosene, and Sustainable Aviation Fuel

Equipment previously permitted under MAQP #5263-00 and changes to the original project design including other new equipment is noted below:

Hydrogen Plant #4 will be installed at the MRL plant to supply hydrogen feedstock to the Renewable Diesel Unit (RDU)

- Hydrogen Plant #4 Reformer Heater (H-4801)
- Piping fugitive components and
- Wastewater components

New Tanks storing either renewable feed or renewable fuels

- Tank #301
- Tank #302
- Tank #303
- Tank #304
- Tank #305

MRL also proposes to receive, refurbish as necessary, and operate the following existing equipment transferred from CMR

RDU Combined Feed Heater (H-4101)

Hydrogen Plant #3: (including Hydrogen Plant #3 Reformer Heaters H-3815A and H-3815B given new emitting unit numbers).

MHC Fractionator Feed Heater (H-4102) (Now RDU Fractionator Feed Heater H-4102)

Tanks

- Tank #29
- Tank #50
- Tank #102
- Tank #112
- Tank #116
- Tank #128 and
- Tank #140

Associated piping, valves, pumps and supporting equipment.

The plant will also share some connectivity with flaring devices, material unloading and loading facilities, utility systems (e.g., steam and cooling water), and wastewater treatment systems owned and operated by CMR. These are further described in the permit analysis.

Existing and new equipment elated to Renewable Kerosene and Sustainable Aviation Fuel Production and other Design Changes.

Existing RDU side stripper for renewable kerosene production.

New piping (pumps, valves, flanges, connectors) and heat exchanger to handle and cool renewable kerosene.

New process vessels in the RDU to perform filtration, coalescence and drying of renewable kerosene.

Four new tanks to store renewable kerosene and sustainable aviation fuel (SAF)
- Tank #306 for storing renewable kerosene
- Tank #307 for storing renewable kerosene
- Tank #308 for storing renewable kerosene or sustainable aviation fuel
- Tank #309 for storing renewable kerosene or sustainable aviation fuel

Tank #0801 for storing conventional diesel which will be blended with renewable diesel during railcar loading operations.

B. Source Description

The equipment described above will operate at the MRL Great Falls Renewable Fuels Plant, which will be adjacent to the CMR Great Falls Refinery. MRL will operate as a subsidiary to Calumet Specialty Products Partners, L.P., as does CMR. The equipment operating at the project site will not be a petroleum refinery and the numerous regulatory requirements for petroleum refineries will not apply to any of the new or transferred equipment operating under MAQP #5263-01. The renewable fuel products, including sustainable aviation fuel that is produced will be marketed into Canadian and West Coast U.S. markets.

C. Response to Public Comments

Comments received from Montana Renewables

PD Section Referenced	Comment	DEQ Response
Section II.A.1.b	Add "monitoring" to oxygen system description	Modified as requested
Section II.A.1.k	Separate the two conditions to read "H-4101 shall not combust RDU off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust RDU off-gas fuel containing H_2S in excess of 100 ppmv on an annual average basis."	Modified as requested
Section II.A.2.c	Spell out filterable and condensable where they were previously abbreviated. For this condition and any other in the PD.	Modified as requested
Section II.A.2.c.i-iii	Add "on a 1-hour average" to each of these three conditions	Modified as requested
Section II.A.3.e	Separate the two conditions to read "H-4801 shall not combust RDU off-gas fuel containing H_2S in excess of 30 ppmv. Additionally, the heater shall not combust RDU off-gas fuel containing H_2S in excess of 100 ppmv on an annual average basis."	Modified as requested
Section II.A.3.g	Modify condition to read "The annual average firing rate…"	Modified as requested
Section II.A.4	Delete description: "For renewable feed, renewable fuels, naphtha, kerosene, sustainable aviation fuel or RDU slop oil" as the sub-conditions identify materials to be stored	Modified as requested
Section II.A.4.d	Add Tank #303 to this condition	Modified as requested
Section II.A.4.i	Remove renewable kerosene as this tank will only store conventional diesel	Modified as requested
Section II.A.9	Clarify condition to read "PUT piping fugitive components"	Modified as requested

Section II.A.9.d	Add new condition "PTU piping fugitive components "in VOC service" shall comply with the equipment leak provisions found in 40 CFR 60.482-1a through 60.482-10a."	Modified as requested
Section II.A.11	Insert "and PTU" before wastewater components	Modified as requested
Section II.A.11	Add new condition "PTU "individual drain systems," "oil-water separators," and "aggregate facilities" shall comply with the provisions found in 40 CFR 60.692–1 through 60.692–7. The PTU wastewater components shall comply with NESHAP Subpart FF."	Modified as requested
Section II.A.17.a	Modify condition to read "NOx emissions shall not exceed 0.04 lb/MMBtu (Higher Heating Value) (HHV) on a 1-hour average using ULNBs."	Modified as requested
Section II.A.17.k	Modify conditions to read "H-4102 shall not combust RDU off-gas fuel containing H2S in excess of 30 ppmv. Additionally, the heater shall not combust RDU off-gas fuel containing H2S in excess of H2S and 10 ppmv on an annual average basis."	Modified as requested
Section II.A.18.a	Modify condition to read "NOx emissions shall not exceed 0.02 lb/MMBtu (HHV) on a 1-hour average using (ULNBs)."	Modified as requested
Section II.B.2	Modify this condition to make it consistent with the timing of other heaters that are being transferred from CMR to MRL.	Modified as requested
Section II.B.7	Modify this condition to read "MRL shall sample and analyze the concentration (dry basis) of H2S at least once per month in order to demonstrate compliance with the limits in Section II.A.1.k, II.A.3.e., and II.A17.k."	Modified as requested
Section II.A.D	Modify condition to read "Date of transfer of Hydrogen Plant #3 from CMR to MRL and dates of transfer of each of the existing tanks (#29, #50, #102, #112, #116, #128 and #140) from CMR to MRL within 15 working days of transfer of each."	Modified as requested

Permit Analysis: Section II.C.8	Add new condition that H-4201 will be subject to Subpart Dc	Modified as requested
Environmental Analysis	Minor text changes were made to the EA including identifying the facility name as MRL Great Falls Renewable Fuels Plant	Modified as requested

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   MRL shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}
11. ARM 17.8.230 Fluoride in Forage

MRL must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, MRL shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. Sulfur Oxide Emissions-Sulfur in Fuel. This rule requires that no person shall cause, allow or permit to be

discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). MRL is considered an NSPS affected facility under 40 CFR Part 60 (portions of the transferred and shared equipment was already subject) and is subject to the requirements of the following subparts.

    a. 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to an NSPS Subpart as listed below:

    b. 40 CFR 60, Subpart D_C – Standards of Performance for Small Industrial-Commercial Institutional Steam Generating Units.

    c. 40 CFR 60, 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.

9. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.

    a. 40 CFR 61, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAP Subpart as listed below:

    b. 40 CFR 61, Subpart M – National Emission Standard for Asbestos. Any demolition occurring would fall under this subpart as applicable.

    c. 40 CFR 61, Subpart FF – National Emission Standard for Benzene Waste Operations

10. ARM 17.8.342 – Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:

    a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAP Subpart as listed below:

    b. 40 CFR 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

c. 40 CFR 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. MRL must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP).

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. MRL submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. MRL has a PTE greater than 25 tons per year of NOx, CO and VOCs, therefore an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. MRL submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. MRL submitted an affidavit of publication of public notice for May 19, 2022, May 26, 2022, and June 2, 2002, in the Great Falls Tribune, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving MRL of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

12. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

13. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

16. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, Montana Code Annotated (MCA).

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because although the facility is a listed source its PTE is below 100 tons per year for all non-greenhouse gas pollutants.

H. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #5263-01 for MRL, the following conclusions were made:

a. The facility's PTE is less than 100 tons/year for non-greenhouse gas pollutants.

b. The facility's PTE, in combination with the CMR Great Falls Refinery's PTE is greater than 10 tons/year for any one HAP and greater than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to NSPS 40 CFR 60, Subpart A, Subpart Dc, and Subpart Kb.

e. This facility is subject to NESHAP 40 CFR 63, Subpart A, Subpart FFFF and Subpart DDDDD.

f. This source is not a Title IV affected source, or a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that MRL is subject to the Title V operating permit program. Since there is common ownership and adjacent/contiguous property, Title V applicability is assumed as long as the current ownership structure exists.

III. BACT Determination

A BACT determination is required for each new or modified source. MRL shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

The BACT determination summary is presented directly below. The individual BACT evaluations for all emitting units by pollutant is included below the summary table.

Emissions Unit	Pollutant	Control Technology/ Work Practice	Emissions Level
RDU Fractionator Feed Heater (H-4102)	CO	Good Combustion Practices	0.055 lb/MMBtu (Higher Heating Value (HHV))
			(1-hour average)
	NOx	ULNBs	0.04 lb/MMBtu (HHV) (1-hour average)
	PM	Good Combustion Practices	0.00051 lb/MMBtu (HHV)
	(filt.)		(1-hour average)
	PM_{10}	Good Combustion Practices	0.00051 lb/MMBtu (HHV)
	(filt. + cond.)		(1-hour average)
	$PM_{2.5}$	Good Combustion Practices	0.00042 lb/MMBtu (HHV)
	(filt. + cond.)		(1-hour average)
	SO_2	Low Sulfur Gaseous Fuel	Fuel gas containing ≤30 ppmv H_2S and ≤10 ppmv H_2S on an annual average basis
	VOC	Good Combustion Practices	-
Hot Oil Heater (H- 4201)	CO	Good Combustion Practices	0.04 lb/MMBtu (HHV) (1-hour average)
	NOx	ULNBs	0.02 lb/MMBtu (HHV) (1-hour average)
	PM	Good Combustion Practices	-
	(filt.)		
	PM_{10}	Good Combustion Practices	-
	(filt. + cond.)		
	$PM_{2.5}$	Good Combustion Practices	-
	(filt. + cond.)		
	SO_2	Low Sulfur Gaseous Fuel (Pipeline Quality Natural Gas)	-
	VOC	Good Combustion Practices	-
Tank #306	VOC	Fixed Roof with Submerged Fill	-
Tank #307	VOC	Fixed Roof with Submerged Fill	-
Tank #308	VOC	Fixed Roof with Submerged Fill	-
Tank #309	VOC	Fixed Roof with Submerged Fill	-
Tank #0801	VOC	Fixed Roof with Submerged Fill	-
Tank #4201	VOC	Carbon Adsorption	-
Hot Oil Expansion Tank (D-4203)	VOC	Proper Equipment Design and Operating Practices	-
PTU Blowdown Drum (D-4208)	VOC	Carbon Adsorption	-
PTU Piping Fugitive Components	VOC	Equipment Design and LDAR	-
PTU Wastewater Components	VOC	Equipment Design, Monitoring, and Maintenance	-
Loading - Renewable Kerosene/Sustainable Aviation Fuel			
	VOC	Submerged Fill Loading	-
Loading - PTU Wastewater	VOC	Carbon Adsorption	-

RDU Fractionator Feed Heater (H-4102)

Carbon Monoxide (CO)

Step 1: Identify Control Technologies

Good Combustion Practices
Good combustion practices for a gaseous fuel enclosed combustion device provide a properly set and controlled air-to-fuel ratio and appropriate combustion zone residence time, temperature, and turbulence parameters essential to achieving low CO emission levels. Incomplete combustion of fuel hydrocarbons can occur because of improper combustion mechanisms, which may result from poor burner/combustion device design, operation, and/or maintenance. However, a heater is designed and typically operated to maximize fuel combustion efficiency so that its fuel usage cost is minimized while maximizing process heating performance. Good combustion practices can be achieved by following a combustion device manufacturer's operating procedures and guidelines, as well as complying with NESHAP Subpart DDDDD work practice standards, which require a combustion device to undergo regular tune-ups.

Thermal Oxidation

Thermal oxidation can be used to reduce CO contained in a source's exhaust stream by maintaining the stream at a high enough temperature in the presence of oxygen, resulting in the oxidation of CO to CO_2. Thermal oxidation of a CO exhaust stream can be achieved by routing the stream to a flare, afterburner, or thermal oxidizer. The effectiveness of all thermal oxidation processes is influenced by residence time, turbulence, and temperature. Auxiliary fuel is typically required to achieve the temperature needed to ensure proper CO exhaust stream oxidation in a thermal oxidation process. If additional fuel is present in the feed stream, some oxidizers are self-sustaining and do not require additional fuel. The necessary amount of auxiliary fuel is dependent on the CO content of the exhaust stream, as well as the amount of hydrocarbon that may be present in the exhaust stream.

Catalytic Oxidation

Catalytic oxidation makes use of catalysts, using precious metals platinum, palladium, or rhodium, to reduce the temperature at which CO oxidizes to CO_2. The effectiveness of catalytic oxidation is dependent on the exhaust stream temperature and the presence of potentially poisoning contaminants in the exhaust stream. The amount of catalyst volume is dependent upon the exhaust stream flow rate, CO content, and temperature, as well as the desired CO removal efficiency. The catalyst will experience activity loss over time due to physical deterioration and/or chemical deactivation. Therefore, periodic testing of the catalyst is necessary to monitor its activity (i.e., oxidation promoting effectiveness) and predict its remaining life. As needed, the catalyst will require periodic replacement. Catalyst life varies from manufacturer-to manufacturer, but three to six-year windows are not uncommon.

Step 2: Eliminate Technically Feasible Options

Good Combustion Practices

Good combustion practices are an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater.

Thermal Oxidation

Thermal oxidation is not technically feasible for the control of CO emissions from the heater due to the very low concentration of CO in its exhaust stream. The application of thermal oxidation to reduce the heater's CO emission rate would require the combustion of a considerable amount of fuel to achieve the elevated temperature necessary to promote the oxidation of the small amount of CO that will be present in the heater's exhaust stream. This fuel combustion would generate additional combustion pollutants, including CO. Thus, the CO emission reduction effectiveness of the thermal oxidation system would be reduced, if not negated, because of the CO generated by the thermal oxidation process.
In summary, the addition of a second thermal oxidation process to the heater system may not reduce the heater's CO emissions by any appreciable amount, if at all, and this add-on control technology would considerably increase the energy requirements of the heater system while notably increasing the amount of combustion pollutants, such as NOx and CO_2, emitted into the atmosphere. Furthermore, research of emission control technology application data (i.e., EPA's Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC) database) indicates thermal oxidation has not been used to control CO emissions from a comparable heater. Based on these factors, MRL determined that it is not technically feasible to use thermal oxidation on this heater to control the heater's CO emissions.

Catalytic Oxidation

Catalytic oxidation is not technically feasible for the control of CO emissions from the heater because its exhaust gas temperature is too low for the effective operation of the oxidation catalyst. The optimum temperature range for catalytic oxidation is 850 to 1,100°F. Below temperatures of 500 to 600°F, the CO removal efficiency of the oxidation catalyst is considerably reduced. The heater's convection section incorporates heat recovery to heat a process stream in a set of coils. Specifically, the convection section incorporates a feed preheat coil. The exhaust gas temperature after this heat recovery operation is too low for the effective operation of catalytic oxidation. Moreover, due to the considerably low concentration of CO in the heater's exhaust stream, the potential effectiveness of a catalytic oxidation system in this case would be limited.

Step 3: Rank Remaining Control Technologies

The only remaining available CO emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 4: Evaluate Most Effective Control Options

The only remaining available CO emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 5: Select BACT

MRL determined that good combustion practices represent the maximum air pollution control capability for CO emissions from the RDU Fractionator Feed Heater (H-4102).

Therefore, MRL will control CO emissions from the heater by using good combustion practices and complying with the following emission limitation: CO emissions from the RDU Fractionator Feed Heater (H-4102) shall not exceed 0.055 lb/MMBtu (HHV), based on a 1-hour average.

NOx

The RDU Fractionator Feed Heater (H-4102) will emit NOx, primarily due to the "thermal" and "prompt" NOx generation mechanisms because the heater's fuel will not contain appreciable amounts of organo-nitrogen compounds that result in "fuel" NOx emissions. Thermal NOx results from the high temperature thermal dissociation and subsequent reaction of combustion air molecular nitrogen and oxygen, and it tends to be generated in the high temperature zone near the burner of an external combustion device. The rate of thermal NOx generation is affected by the following three factors: oxygen concentration, peak flame temperature, and duration at peak flame temperature. As these three factors increase in value, the rate of thermal NOx generation increases.

Prompt NOx occurs at the flame front through the relatively fast reaction between combustion air nitrogen and oxygen molecules and fuel hydrocarbon radicals, which are intermediate species formed during the combustion process. Prompt NOx may represent a meaningful portion of the NOx emissions resulting from low NOx burners (LNBs) and ultra low NOx burners (ULNBs).The heater will not be subject to an NSPS NOx emission standard after the proposed change in its operation. However, the heater was previously subject to a BACT requirement (ARM 17.8.752) of 0.040 lb/MMBtu (HHV) based on a 3-hour average.

Step 1: Identify Control Technologies

Low NOx Burners, Ultra Low NOx Burners (LNBs/ULNBs)

LNBs/ULNBs are available in a variety of configurations and burner types, and they may incorporate one or more of the following concepts: lower flame temperatures; fuel rich conditions at the maximum flame temperature; and decreased residence times for oxidation conditions. These burners are often designed so that fuel and air are pre-mixed prior to combustion, resulting in lower and more uniform flame temperatures. Pre-mix burners may require the aid of a blower to mix the fuel with air before combustion takes place. Additionally, an LNB/ULNB may be designed so that a portion of a combustion device's flue gas is recycled back into the burner in order to reduce the burner's flame temperature. However, instead of recycled flue gas, steam can also be used to reduce a burner's flame temperature. Furthermore, LNBs/ULNBs may use staged combustion, which involves creating a fuel rich zone to start combustion and stabilize a burner's flame, followed by a fuel lean zone to complete combustion and reduce the burner's peak flame temperature.

Selective Catalytic Reduction (SCR)

SCR is a post-combustion treatment technology that promotes the selective catalytic chemical reduction of NOx (both nitric oxide and nitrogen dioxide) to molecular nitrogen and water. SCR technology involves the mixing of a reducing agent (aqueous or anhydrous ammonia or urea) with NOx-containing combustion gases and the resulting mixture is passed through a catalyst bed, where the catalyst serves to lower the activation energy of the NOx reduction reactions. In the catalyst bed, the NOx and ammonia contained in the combustion gas-reagent mixture are adsorbed onto the SCR catalyst surface to form an activated complex and then the catalytic reduction of NOx occurs, resulting in the production of nitrogen and water from NOx. The nitrogen and water products of the SCR reaction are desorbed from the catalyst surface into the combustion exhaust gas passing through the catalyst bed. From the SCR catalyst bed, the treated combustion exhaust gas is emitted to the atmosphere. SCR systems can effectively operate at a temperature above 350°F and below 1,100°F, with a more refined temperature window dependent on the composition of the catalyst used in the SCR system.

Selective Non-catalytic Reduction (SNCR)
SNCR is a post-combustion treatment technology that is effectively a partial SCR system. A reducing agent (aqueous or anhydrous ammonia or urea) is mixed with NOx-containing combustion gases and a portion of the NOx reacts with the reducing agent to form molecular nitrogen and water. As indicated by the name of this technology, SNCR unlike SCR does not utilize a catalyst to promote the chemical reduction of NOx.

Because a catalyst is not used with SNCR, the NOx reduction reactions occur at high temperatures. SNCR typically requires thorough mixing of the reagent in the combustion chamber of an external combustion device because this technology requires at least 0.5 seconds of residence time at a temperature above 1,600°F and below 2,100°F. A combustion device equipped with SNCR technology may require multiple reagent injection locations because the optimum location (temperature profile) for reagent injection may change depending on the load at which the combustion device is operating. At temperatures below 1,600°F, the desired NOx reduction reactions will not effectively occur and much of the injected reagent will be emitted to the atmosphere along with the mostly uncontrolled NOx emissions. At temperatures above 2,100°F, the desired NOx reduction reactions will not effectively occur, and the ammonia or urea reagent will begin to react with available oxygen to produce additional NOx emissions.

Non-Selective Catalytic Reduction (NSCR)

NSCR is a post-combustion treatment technology that promotes the catalytic chemical reduction of NOx (both nitric oxide and nitrogen dioxide) to molecular nitrogen and water. NSCR technology has been applied to nitric acid plants and rich burn and stoichiometric internal combustion engines to reduce NOx emissions. NSCR technology uses a reducing agent (hydrocarbon, hydrogen, or CO), which can be inherently contained in the exhaust gas due to rich combustion conditions or injected into the exhaust gas, to react in the presence of a catalyst with a portion of the NOx contained in the source's exhaust gas to generate molecular nitrogen and water. NSCR systems can effectively operate at a temperature above 725°F and below 1,200°F, with a more refined temperature window dependent on the source type and composition of the catalyst used in the NSCR system.

Step 2: Eliminate Technically Infeasible Options

LNBs/ULNBs
The heater is already equipped with ULNBs. Therefore, this option is technically feasible and was incorporated into the baseline emissions for the heater.

SCR

This option is technically feasible for the heater.

SNCR

Due to the temperature and mixing profile sensitivities of an SNCR system, these systems often have not achieved the expected amounts of theoretical NOx emission reduction, especially in turndown modes of operation. However, MRL conservatively estimated SNCR is technically feasible to control the heater's NOx emissions.

NSCR

NSCR technology is not technically feasible for the control of NOx emissions from the heater because it does not operate at the 0.5% or less excess oxygen concentration necessary to ensure NOx reduction with NSCR. Instead, the heater operates with an excess oxygen concentration of approximately 2-3%. This amount of excess oxygen promotes both low levels of CO and high combustion (thermal) efficiency, while also providing for safe heater operations during variations in fuel gas operating conditions (e.g., fuel gas composition changes, fuel gas supply pressure variations). Furthermore, research of EPA's RBLC database indicates NSCR has not been used to control NOx emissions from a comparable heater. These factors indicate it is not technically feasible to use NSCR to control the heater's NOx emissions.

Step 3: Rank Remaining Control Technologies

The remaining available NOx emission control technologies for the RDU Fractionator Feed Heater (H-4102) are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

SCR
SNCR
ULNBs: this control technology was incorporated into the emissions unit's baseline emissions because the unit is already equipped with ULNBs.

Step 4: Evaluate Most Effective Control Options

SCR

MRL estimated that the installation and operation of an SCR system on the heater would result in a cost effectiveness equal to approximately $43,699 per ton of NOx emission reduction, which is not cost effective. Also, the installation of an SCR system on the heater would require additional energy to operate the SCR system's electrical equipment (e.g., pumps, heaters/vaporizers, instrumentation) and provide fan
power to overcome the pressure drop across the SCR catalyst bed(s). This increase in electricity usage at the plant would generate emissions at the power plants generating the electricity thus reducing the net environmental benefit of the SCR system. Furthermore, the SCR catalyst would require periodic replacement, which would result in a spent catalyst waste stream. This waste stream may represent hazardous waste depending on the composition of the catalyst and the heater's combustion products collected on the catalyst.

An SCR system would also cause ammonia slip during operation, resulting in ammonia emissions from the heater's stack, which may negatively impact regional haze due to an increase in the amount of atmospheric ammonia available to generate visibility impairing ammonium nitrates and ammonium sulfates.

In summary, MRL determined that it would not be cost effective to equip the heater with an SCR system, and the operation of an SCR system on the heater would likely result in additional emissions, as well as the generation of an additional solid waste stream at the site. For these reasons, MRL eliminated an SCR system from consideration as the maximum air pollution control capability for the heater's NOx emissions.

SNCR

MRL estimated that the installation and operation of an SNCR system on the heater would result in a cost effectiveness equal to approximately $31,752 per ton of NOx emission reduction, which is not cost effective. The installation of an SNCR system on the heater would require additional energy to operate the SNCR system's electrical equipment (e.g., pumps, heaters/vaporizers, instrumentation). This increase in electricity usage at the site would generate emissions at the power plants generating the electricity thus reducing the net environmental benefit of the SNCR system. Furthermore, an SNCR system would experience ammonia slip during operation, resulting in ammonia emissions from the heater's stack, which may negatively impact regional haze due to an increase in the amount of atmospheric ammonia available to generate visibility impairing ammonium nitrates and ammonium sulfates.

In summary, MRL determined that it would not be cost effective to equip the heater with an SNCR system, and the operation of an SNCR system on the heater would likely result in additional emissions. For these reasons, MRL eliminated an SNCR system from consideration as the maximum air pollution control capability for the heater's NOx emissions.

Step 5: Select BACT

MRL determined that ULNBs represent the maximum air pollution control capability for the NOx emissions from the RDU Fractionator Feed Heater (H-4102). The heater is already equipped with ULNBs and MRL will continue to comply with the following emission limitation that was previously determined to reflect the BACT for this unit where NOx emissions from the RDU Fractionator Feed Heater (H-4102) shall not exceed 0.04 lb/MMBtu (HHV), based on a 1-hour average.

PM/PM_{10}/$PM_{2.5}$

The RDU Fractionator Feed Heater (H-4102) will emit PM_{10} and $PM_{2.5}$ comprised of filterable and condensable portions. A gaseous fuel combustion device can emit PM_{10} and $PM_{2.5}$ at elevated levels due to the incomplete combustion of higher molecular weight hydrocarbons present in the device's gaseous fuel. However, the heater will combust pipeline quality natural gas and RDU off-gas, which are primarily comprised of hydrogen and relatively low molecular weight hydrocarbons. Therefore, elevated PM_{10} and $PM_{2.5}$ emissions from the heater as a result of the incomplete combustion of high molecular weight hydrocarbons are not expected to occur. Additionally, the referenced fuels will contain low levels of sulfur, further minimizing the generation of PM_{10} and $PM_{2.5}$ when they are combusted.

The heater is not currently subject to an NSPS or NESHAP PM, PM_{10}, or $PM_{2.5}$ emission standard, and it will not be subject to an NSPS or NESHAP PM, PM_{10}, or $PM_{2.5}$ emission standard after the proposed change in its operation. However, the heater is subject to the following DEQ opacity and BACT limits for PM, PM_{10}, and $PM_{2.5}$ standards:

Pursuant to ARM 17.8.304(2), emissions from the heater shall not exceed an opacity of 20% or greater averaged over six consecutive minutes.

Pursuant to ARM 17.8.752, PM emissions from the heater shall not exceed 0.00051 lb/MMBtu.

Pursuant to ARM 17.8.752, PM_{10} emissions from the heater shall not exceed 0.00051 lb/MMBtu.

Pursuant to ARM 17.8.752, $PM_{2.5}$ emissions from the heater shall not exceed 0.00042 lb/MMBtu.

Step 1: Identify Control Technologies

Good Combustion Practices
Electrostatic Precipitator
Filter
Wet Scrubber
Cyclone
Good Combustion Practices – See description of Good Combustion practices on page 11.

Electrostatic Precipitator (ESP)

An ESP uses an electric field and collection plates to remove PM from a flowing gaseous stream. The PM contained in the gaseous stream is given an electric charge by passing the stream through a corona discharge. The resulting negatively charged PM is collected on the flowing gaseous stream that is being treated by the ESP. In a dry ESP, the collection plate cleaning process can be accomplished mechanically by knocking the PM loose from the plates. Alternatively, in a wet ESP, a washing technique is used to remove the collected PM from the collection plates. ESPs can be configured in several ways, including a plate-wire ESP, a flat-plate ESP, and a tubular ESP. As the diameter of the PM decreases, the efficiency of an ESP decreases.

Filter

A filter is a porous media that removes PM from a gaseous stream as the stream passes through the filter. For an emissions unit with an appreciable exhaust rate, the filter system typically contains multiple filter elements. Filters can be used to treat exhaust streams containing dry or liquid PM.

Filters handling dry PM become coated with collected PM during operation and this coating ("cake") contributes to the filtration mechanism. A dry PM filter system commonly used in industrial scale applications is a "baghouse." A baghouse is comprised of multiple cylindrical bags, and the number of bags is dependent on the exhaust rate requiring treatment, the PM loading of the exhaust stream, and the baghouse design. The two most common baghouse designs today are the reverse-air and pulse-jet designs. These design references indicate the type of bag cleaning system used in the baghouse.

Filters handling liquid PM rely on the impingement of the entrained liquid PM on the surface of the filter media and the retention of these liquid particles on the surface until multiple particles coalesce into particles of sufficient size that are able to fall back against the flowing gas stream and collect at a location below the filter. For the high efficiency removal of submicron liquid particles from a gaseous stream, Brownian diffusion filters are used. "Brownian diffusion" is the random movement of submicron particles in a gaseous stream as these particles collide with gas molecules. Liquid PM filter systems can be comprised of pad or candle filter elements. These filter elements require little operation and maintenance attention.

Wet Scrubber

Wet scrubber uses absorption to remove PM from a gaseous stream. Absorption is primarily a physical process, though it can also include a chemical component, in which a pollutant in a gas phase contacts a scrubbing liquid and is dissolved in the liquid. A key factor dictating the performance of a wet scrubber is the solubility of the pollutant of concern in the scrubbing liquid. Water is commonly used as the scrubbing liquid in a wet scrubber used for PM emission control, but other liquids can be used depending on the type of PM or other pollutant(s) to be removed from the gaseous stream undergoing treatment. There are several types of wet scrubbers, including packed-bed counterflow scrubbers, packed-bed cross-flow scrubbers, bubble plate scrubbers, and tray scrubbers.

Cyclone

A cyclone is the most common type of inertial separator used to collect medium-sized and coarse PM from gaseous streams. The PM contained in a gaseous stream treated in a cyclone moves outward under the influence of centrifugal force until it contacts the wall of the cyclone. The PM is then carried downward by gravity along the wall of the cyclone and collected in a hopper located at the bottom of the cyclone. Although cyclones provide a relatively low cost, mechanically simple option for the removal of larger diameter PM from gaseous streams, alone they do not typically provide adequate PM removal, especially when the gaseous stream contains smaller diameter PM. Instead, these devices are typically used to preclean a gaseous stream by removing larger diameter PM upstream of PM emission control devices that are more effective at removing smaller diameter PM.

Step 2: Eliminate Technically Infeasible Options

Good Combustion Practices

Good combustion practices are already an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater.

ESP

MRL estimated that the PM emitted by the heater will be PM_{10} only, which is a characteristic that would limit the control effectiveness of an ESP. Additionally, the PM_{10} concentration in the heater's exhaust stream is below the concentration typically seen in an ESP's exhaust stream. Thus, an ESP would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates an ESP has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use an ESP to control PM emissions from the heater.

Filter

The PM_{10}-only profile of the heater's PM emissions would limit the control effectiveness of a filter. Additionally, the PM_{10} concentration in the heater's exhaust stream is below the concentration typically seen in a filter's exhaust stream. Thus, a filter would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates a filter has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a filter to control PM emissions from the heater.

Wet Scrubber

The PM_{10}-only profile of the heater's PM emissions indicates a wet scrubber would require a considerable pressure drop to effectively reduce the heater's PM emissions. Additionally, the PM_{10} concentration in the heater's exhaust stream is below the concentration typically seen in a wet scrubber's exhaust stream. Furthermore, the liquid carryover in the exhaust stream from a wet scrubber contains dissolved and suspended solids, which would result in a new PM emission mechanism, reducing any negligible PM_{10} control effectiveness of the wet scrubber in this application. Moreover, research of EPA's RBLC database indicates a wet scrubber has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a wet scrubber to control PM emissions from the heater.

Cyclone

The PM_{10}-only profile of the heater's PM emissions would limit the control effectiveness of a cyclone. Additionally, the PM_{10} concentration in the heater's exhaust stream is below the concentration typically seen in a cyclone's exhaust stream. Thus, a cyclone would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates a cyclone has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a cyclone to control PM emissions from the heater.

Step 3: Rank Remaining Control Technologies

The only remaining available PM, PM_{10}, and $PM_{2.5}$ emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 4: Evaluate Most Effective Control Options

The only remaining available PM, PM_{10}, and $PM_{2.5}$ emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 5: Select BACT

MRL determined that good combustion practices represent the maximum air pollution control capability for the PM, PM_{10}, and $PM_{2.5}$ emissions from the RDU Fractionator Feed Heater (H-4102). Therefore, MRL will continue to control PM, PM_{10}, and $PM_{2.5}$ emissions from the heater by using good combustion practices and continuing to comply with the following emission limitations that were previously determined to reflect the performance of the maximum air pollution control capability for this unit:

PM emissions from the heater shall not exceed 0.00051 lb/MMBtu (HHV), based on a 1-hour average;

PM_{10} emissions from the heater shall not exceed 0.00051 lb/MMBtu (HHV), based on a 1-hour average; and

$PM_{2.5}$ emissions from the heater shall not exceed 0.00042 lb/MMBtu (HHV), based on a 1-hour average.

SO_2

The RDU Fractionator Feed Heater (H-4102) will combust a blend of pipeline quality natural gas and RDU off-gas. The natural gas will contain a negligible amount of H2S. Additionally, the RDU off-gas will be treated to minimize its H_2S content. Therefore, the heater will emit only a small amount of SO_2.

The heater is currently subject to the following NSPS Subpart Ja SO_2 emission standards.

Pursuant to NSPS Subpart Ja, the heater shall not burn any refinery fuel gas that contains H_2S in excess of 162 ppmv on a 3-hour rolling average basis and 60 ppmv on a 365 successive calendar day rolling average basis.

However, the heater will not be an affected facility under NSPS Subpart Ja after the MHC is converted to the RDU.

The heater is also subject to the following DEQ SO_2 emission standard, which will continue to apply to the heater after the proposed change in its operation.

Pursuant to ARM 17.8.322(5), the heater shall not burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 ft^3 of gaseous fuel, calculated as H_2S at standard conditions (or approximately 808 ppmv H_2S).

Step 1: Identify Control Technologies

The following are available SO_2 emission control technologies for the RDU Fractionator Feed Heater (H-4102).

Low Sulfur Fuel

Flue Gas Desulfurization

Below, these technologies are generally described.

Low Sulfur Fuel

A gaseous fuel may inherently contain low levels of sulfur compounds, or it may be treated to remove sulfur compounds using absorption or adsorption technologies. For example, pipeline quality natural gas may be from a well that produces inherently low sulfur gas, or it may be treated using absorption or adsorption technology to lower its sulfur content. Low sulfur gaseous fuels result in low levels of SO_2 emissions when they are combusted.

Flue Gas Desulfurization

Flue gas desulfurization is commonly used to reduce SO_2 emissions from coal-fired and oil- fired combustion sources due to the relatively high concentration of SO_2 (thousands of ppmv) contained in the flue gas generated by these sources. Flue gas desulfurization can be accomplished using wet, semi-dry, and dry scrubbers, although wet scrubbers are normally capable of higher SO_2 removal efficiencies than semi-dry and dry scrubbers.

In a wet scrubber, an aqueous slurry of sorbent is injected into a source's flue gas and the SO_2 contained in the gas dissolves into the slurry droplets where it reacts with an alkaline compound present in the slurry. The treated flue gas is then emitted to the atmosphere after passing through a mist eliminator that is designed to remove any entrained slurry droplets, while the falling slurry droplets make their way to the bottom of the scrubber where they are collected and either regenerated and recycled or removed as a waste or byproduct.

Semi-dry scrubbers are like wet scrubbers, but the slurry used in a semi-dry scrubber has a higher sorbent concentration, which results in the complete evaporation of the slurry water and the formation of a dry spent sorbent material that is entrained in the treated flue gas. This dry spent sorbent is removed from the flue gas using a baghouse or ESP. In a dry scrubber, a dry sorbent material is pneumatically injected into a source's flue gas and the dry spent sorbent material entrained in the treated flue gas is removed using a baghouse or ESP

Step 2: Eliminate Technically Infeasible Options

Low Sulfur Fuel

Low sulfur fuel is technically feasible for the heater.

Flue Gas Desulfurization

The heater will emit SO_2 at concentrations less than 15 ppmv, which are below the concentrations oftentimes seen in a wet scrubber's exhaust stream. Additionally, the liquid carryover in the exhaust stream from a wet scrubber or the solid carryover in the exhaust stream from a semi-dry or dry scrubber would result in a new PM emission mechanism for the heater. Moreover, research of EPA's RBLC database indicates wet, semi-dry, and dry scrubbers have not been used to control SO_2 emissions from a comparable heater. These factors indicate it would not be technically feasible to use flue gas desulfurization technologies to control SO_2 emissions from the heater.

Step 3: Rank Remaining Control Technologies
The only remaining available SO_2 emission control technology for the RDU Fractionator Feed Heater (H-4102) is low sulfur fuel.

Step 4: Evaluate Most Effective Control Technologies
The only remaining available SO_2 emission control technology for the RDU Fractionator Feed Heater (H-4102) is low sulfur fuel.

Step 5: Select BACT
MRL determined that combusting low sulfur gaseous fuel represents BACT for the SO_2 emissions from the RDU Fractionator Feed Heater (H- 4102). Specifically, MRL will control SO_2 emissions from the RDU Fractionator Feed Heater (H-4102) by combusting gaseous fuel meeting the following H_2S standards: ≤30 ppmv H_2S and ≤10 ppmv H2S on an annual average basis.

VOC

The RDU Fractionator Feed Heater (H-4102) will emit VOC due to the incomplete oxidation of hydrocarbons present in the heater's gaseous fuel. However, the low molecular weight characteristic of the hydrocarbons in the fuel will promote low levels of VOC emissions from the heater.

Furthermore, the heater is equipped with an oxygen monitoring system, which allows the plant to make on-line optimization adjustments to the heater's combustion process, as needed. This system greatly assists in minimizing the heater's VOC emissions by providing the plant with the capability to maintain good combustion practices at the heater.

The heater is not currently subject to an NSPS or NESHAP VOC emission standard, and it will not be subject to an NSPS or NESHAP VOC emission standard after the proposed change in its operation. However, the heater will continue to be subject to the following NESHAP Subpart DDDDD work practice standards that will minimize its VOC emissions.

Pursuant to 40 CFR 63.7540(a)(10)(i), MRL will inspect the heater's burners, and clean or replace any components of the burners as necessary.

Pursuant to 40 CFR 63.7540(a)(10)(ii), MRL will inspect the flame pattern of the heater's burners and adjust the burners as necessary to optimize the flame pattern, consistent with the manufacturer's specifications.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for the RDU Fractionator Feed Heater (H-4102).

Good Combustion Practices

Thermal Oxidation

Catalytic Oxidation

Good Combustion Practices: See page 13 discussion.
Thermal Oxidation See page 13 discussion.
Catalytic Oxidation: See page 13 discussion.

Step 2: Eliminate Technically Infeasible Options

Good Combustion Practices:
Good combustion practices are an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater.

Thermal Oxidation

Thermal oxidation is not technically feasible for the control of VOC emissions from the heater due to the very low concentration of VOC in its exhaust stream. The application of thermal oxidation to reduce the heater's VOC emission rate would require the combustion of a considerable amount of fuel to achieve the elevated temperature necessary to promote the oxidation of the small amount of VOC that will be present in the heater's exhaust stream. This fuel combustion would generate additional combustion pollutants, including VOC. Thus, the VOC emission reduction effectiveness of the thermal oxidation system would be reduced, if not negated, because of the VOC generated by the thermal oxidation process.

In summary, the addition of a second thermal oxidation process to the heater system may not reduce the heater's VOC emissions by any appreciable amount, if at all, and this add-on control technology would considerably increase the energy requirements of the heater system while notably increasing the amount of combustion pollutants, such as NOx and CO_2, emitted into the atmosphere. Furthermore, research of EPA's RBLC database indicates thermal oxidation has not been used to control VOC emissions from a comparable heater. These factors indicate it is not technically feasible to use thermal oxidation to control VOC emissions from the heater.

Catalytic Oxidation

Catalytic oxidation is not technically feasible for the control of VOC emissions from the heater because its exhaust gas temperature is too low for the effective operation of the oxidation catalyst. The optimum temperature range for catalytic oxidation is 850 to 1,100°F. Below temperatures of 500 to 600°F, the VOC removal efficiency of the oxidation catalyst is considerably reduced. As previously discussed, the heater's convection section incorporates heat recovery in the form of a feed preheat coil. The exhaust gas temperature after this heat recovery operation is too low for the effective operation of catalytic oxidation. Moreover, due to the considerably low concentration of VOC in the heater's exhaust stream, the potential effectiveness of a catalytic oxidation system would be limited in this case.

Step3: Rank Remaining Control Technologies

The only remaining available VOC emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 4: Evaluate Most Effective Control Options

The only remaining available VOC emission control technology for the RDU Fractionator Feed Heater (H-4102) is good combustion practices.

Step 5: Select BACT

MRL determined that good combustion practices represent the maximum air pollution control capability for the VOC emissions from the RDU Fractionator Feed Heater (H-4102). Therefore, MRL will control VOC emissions from the heater by using good combustion practices.

Hot Oil Heater (H-4201)

CO

The Hot Oil Heater (H-4201) will combust pipeline quality natural gas, which is primarily comprised of low molecular weight hydrocarbons. The heater will emit CO due to the incomplete oxidation of hydrocarbons present in the natural gas. However, natural gas is a low-carbon fuel. This fuel characteristic will promote low levels of CO emissions from the heater.

Furthermore, the heater will be equipped with an oxygen monitoring system, which will allow the plant to make on-line optimization adjustments to its combustion process, as needed. This system will greatly assist in minimizing the heater's CO emissions by providing the plant with the capability to maintain good combustion practices at the heater.

The heater will not be subject to an NSPS or NESHAP CO emission standard. However, it will be subject to the following NESHAP Subpart DDDDD work practice standards that will minimize its CO emissions.

Pursuant to 40 CFR 63.7540(a)(10)(i), MRL will inspect the heater's burner(s), and clean or replace any components of the burner(s) as necessary.

Pursuant to 40 CFR 63.7540(a)(10)(ii), MRL will inspect the flame pattern of the heater's burner(s) and adjust the burner(s) as necessary to optimize the flame pattern, consistent with the manufacturer's specifications.

Pursuant to 40 CFR 63.7540(a)(10)(iv), MRL will optimize total emissions of CO from the heater. This optimization will be consistent with the manufacturer's specifications and any NOx emission limitation to which the heater is subject

Pursuant to 40 CFR 63.7540(a)(10)(v), MRL will measure the CO and oxygen concentrations in the heater's exhaust stream before and after making the adjustments referenced above.

Step 1: Identify Control Technologies
The following are available CO emission control technologies for the Hot Oil Heater (H- 4201).

Good Combustion Practices

Thermal Oxidation

Catalytic Oxidation

Good Combustion Practices See page 13 discussion.
Thermal Oxidation See page 13 discussion.
Catalytic Oxidation See page 13 discussion.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the CO emission control technologies determined to be available for the Hot Oil Heater (H-4201) is evaluated below.

Good Combustion Practices
Good combustion practices will be an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater.

Thermal Oxidation
Thermal oxidation is not technically feasible for the control of CO emissions from the heater due to the very low concentration of CO expected to be present in its exhaust stream. The application of

thermal oxidation to reduce the heater's CO emission rate would require the combustion of a considerable amount of fuel to achieve the elevated temperature necessary to promote the oxidation of the small amount of CO that will be present in the heater's exhaust stream. This fuel combustion would generate additional combustion pollutants, including CO. Thus, the CO emission reduction effectiveness of the thermal oxidation system would be reduced, if not negated, because of the CO generated by the thermal oxidation process.

In summary, the addition of a second thermal oxidation process to the heater system may not reduce the heater's CO emissions by any appreciable amount, if at all, and this add-on control technology would considerably increase the energy requirements of the heater system while notably increasing the amount of combustion pollutants, such as NOx and CO2, emitted into the atmosphere. Furthermore, research of EPA's RBLC database indicates thermal oxidation has not been used to control CO emissions from a comparable heater. Based on these factors, MRL determined that it is not technically feasible to use thermal oxidation to control the heater's CO emissions.

Catalytic Oxidation
Catalytic oxidation is not technically feasible for the control of CO emissions from the heater because its exhaust gas temperature will be too low for the effective operation of the oxidation catalyst. The optimum temperature range for catalytic oxidation is 850 to 1,100°F. Below temperatures of 500 to 600°F, the CO removal efficiency of the oxidation catalyst is considerably reduced. The heater's convection section will incorporate a coil to recover heat to increase the temperature of the hot oil heated in the heater. The exhaust gas temperature after this heat recovery operation will not be optimal for catalytic oxidation. Moreover, due to the considerably low concentration of CO in the heater's exhaust stream, the potential effectiveness of a catalytic oxidation system in this case would be limited.

Step 3: Rank Remaining Control Technologies
The only remaining available CO emission control technology for the Hot Oil Heater (H- 4201) is good combustion practices

Step 4: Evaluate Most Effective Control Technologies
The only remaining available CO emission control technology for the Hot Oil Heater (H- 4201) is good combustion practices.

Step 5: Select BACT
MRL determined that good combustion practices represent the maximum air pollution control capability for CO emissions from the Hot Oil Heater (H-4201). Therefore, MRL will control CO emissions from the heater by using good combustion practices and complying with the following emission limitation: CO emissions from the Hot Oil Heater (H-4201) shall not exceed 0.04 lb/MMBtu (HHV), based on a 1-hour average.

NOx

The Hot Oil Heater (H-4201) will emit NOx, primarily due to the "thermal" and "prompt" NOx generation mechanisms because the heater's pipeline quality natural gas fuel is not expected to contain organo-nitrogen compounds that result in "fuel" NOx emissions. Thermal NOx results from the high temperature thermal dissociation and subsequent reaction of combustion air molecular nitrogen and oxygen, and it tends to be generated in the high temperature zone near the burner of an external combustion device. The rate of thermal NOx generation is affected by the following three factors: oxygen concentration, peak flame temperature, and duration at peak flame temperature. As these three factors increase in value, the rate of thermal NOx generation increases.

Prompt NOx occurs at the flame front through the relatively fast reaction between combustion air nitrogen and oxygen molecules and fuel hydrocarbon radicals, which are intermediate species formed during the combustion process. Prompt NOx may represent a meaningful portion of the NOx emissions resulting from LNBs and ULNBs due to the relatively low levels of thermal NOx generated by these burners.

The heater will not be subject to an NSPS NOx emission standard.

Step 1: Identify Control Technologies
The following are available NOx emission control technologies for the Hot Oil Heater (H- 4201).

LNBs/ULNBs

SCR

SNCR

NSCR

LNBs/ULNBs See page 13 discussion.
SCR See page 15 discussion.
SNCR See page 16 discussion

NSCR See page 16 discussion.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the NOx emission control technologies determined to be available for the Hot Oil Heater (H-4201) is evaluated below.

LNBs/ULNBs
This option is technically feasible.

SCR
This option is technically feasible.

SNCR
SNCR is not technically feasible for the control of NOx emissions from the heater. A large firebox volume is needed to provide the necessary residence time to achieve the thorough mixing of elevated temperature combustion gas and reagent to successfully reduce NOx emissions using SNCR. However, the heater will have a small firebox volume because it will be designed to minimize space while safely maximizing thermal efficiency.

Additionally, the heater's tube design will be focused on thermal efficiency, providing minimal flexibility to incorporate reagent injection nozzles. This limited flexibility for the placement of reagent injection nozzles is exaggerated when considering accommodations necessary for the heater to operate at varying turndown ratios to be able to stably operate at a wide range of hot oil heating rates. Reagent injection nozzles would likely be required at several locations in the heater's firebox to accommodate the varying loads. However, the heater's small firebox and tube design will not accommodate this layout.

In sum, it is not technically feasible to use SNCR to control NOx emissions from the heater because the heater's small firebox volume and tube design will not effectively accommodate SNCR operations.

NSCR

NSCR technology is not technically feasible for the control of NOx emissions from the heater because it will not operate at the 0.5% or less excess oxygen concentration necessary to ensure NOx reduction with NSCR. Instead, the heater will be designed to operate with an excess oxygen concentration of approximately 3%. This amount of excess oxygen will promote both low levels of CO and high combustion (thermal) efficiency. Furthermore, research of EPA's RBLC database indicates NSCR has not been used to control NOx emissions from a comparable heater. These factors indicate it is not technically feasible to use NSCR to control the heater's NOx emissions

Step 3: Rank Remaining Control Technologies

The remaining available NOx emission control technologies for the Hot Oil Heater (H-4201) are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

SCR

ULNBs: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates ULNBs

Step 4: Evaluate Most Effective Control Options

Below, we evaluate the cost effectiveness of the installation and operation of the NOx emission control technologies that were determined to be technically feasible for the Hot Oil Heater (H-4201) but not already included in its base design.

SCR

MRL estimated that the installation and operation of an SCR system on the heater would result in a cost effectiveness equal to approximately $103,297 per ton of NOx emission reduction, which is not cost effective. The installation of an SCR system on the heater would require additional energy to operate the SCR system's electrical equipment (e.g., pumps, heaters/vaporizers, instrumentation) and provide fan power to overcome the pressure drop across the SCR catalyst bed(s). This increase in electricity usage at the plant would likely result in increased GHG and non-GHG emission rates at one or more power generating stations, reducing the net environmental benefit of the SCR system. Furthermore, the SCR catalyst would require periodic replacement, which would result in a spent catalyst waste stream. This waste stream may represent hazardous waste depending on the composition of the catalyst and the heater's combustion products collected on the catalyst. Lastly, an SCR system would experience ammonia slip during operation, resulting in ammonia emissions from the heater's stack, which may negatively impact regional haze due to an increase in the amount of atmospheric ammonia available to generate visibility impairing ammonium nitrates and ammonium sulfates.

In summary, MRL determined that it would not be cost effective to equip the heater with an SCR system, and the operation of an SCR system on the heater would likely result in collateral emissions of GHG and non-GHG pollutants, as well as the generation of an additional solid waste stream at the site. For these reasons, MRL eliminated an SCR system from consideration as the maximum air pollution control capability for the heater's NOx emissions.

Step 5: Select BACT
MRL determined that ULNBs represent the maximum air pollution control capability for the NOx emissions from the Hot Oil Heater (H-4201). Therefore, MRL will control NOx emissions from the heater by equipping it with ULNBs and complying with the following emission limitation: NOx emissions from the Hot Oil Heater (H-4201) shall not exceed 0.02 lb/MMBtu (HHV), based on a 1-hour average.

$PM/PM_{10}/PM_{2.5}$

The Hot Oil Heater (H-4201) will emit PM_{10} and $PM_{2.5}$ comprised of filterable and condensable portions. A gaseous fuel combustion device can emit PM_{10} and $PM_{2.5}$ at elevated levels due to the incomplete combustion of higher molecular weight hydrocarbons present in the device's gaseous fuel. However, the heater will combust pipeline quality natural gas, which is primarily comprised of low molecular weight hydrocarbons. Therefore, elevated PM_{10} and $PM_{2.5}$ emissions from the heater as a result of the incomplete combustion of high molecular weight hydrocarbons are not expected to occur. Additionally, the natural gas will contain negligible levels of sulfur-containing compounds, further minimizing the generation of PM_{10} and $PM_{2.5}$ when it is combusted.

The heater will not be subject to an NSPS or NESHAP PM, PM_{10}, or $PM_{2.5}$ emission standard. However, it will be subject to the following DEQ opacity and PM standards.

Pursuant to ARM 17.8.304(2), emissions from the heater shall not exceed an opacity of 20% or greater averaged over 6 consecutive minutes.

Pursuant to ARM 17.8.309, PM emissions from the heater shall not exceed 0.44 lb/MMBtu.

Step 1: Identify Control Technologies

Good Combustion Practices

ESP

Filter

Wet Scrubber

Cyclone

Good Combustion Practices See page 13 discussion.
ESP See page 19 discussion
Filter See page 19 discussion
Wet Scrubber See page 20 discussion.
Cyclone See page 20 discussion.

Step 2: Eliminate Technically Infeasible Options

Good Combustion Practices
Good combustion practices will be an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater.

ESP
MRL estimated that the PM emitted by the heater will be PM_{10} only, which is a characteristic that would limit the control effectiveness of an ESP. Additionally, the PM_{10} concentration in the heater's exhaust stream will be below the concentration typically seen in an ESP's exhaust stream. Thus, an ESP would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates an ESP has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use an ESP to control PM emissions from the heater.

Filter
The PM_{10}-only profile of the heater's PM emissions would limit the control effectiveness of a filter. Additionally, the PM_{10} concentration in the heater's exhaust stream will be below the concentration typically seen in a filter's exhaust stream. Thus, a filter would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates a filter has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a filter to control PM emissions from the heater.

Wet Scrubber
The PM_{10}-only profile of the heater's PM emissions indicates a wet scrubber would require a considerable pressure drop to effectively reduce the heater's PM emissions. Additionally, the PM_{10} concentration in the heater's exhaust stream will be below the concentration typically seen in a wet scrubber's exhaust stream. Furthermore, the liquid carryover in the exhaust stream from a wet scrubber contains dissolved and suspended solids, which would result in a new PM emission mechanism, reducing any negligible PM_{10} control effectiveness of the wet scrubber in this application. Moreover, research of EPA's RBLC database indicates a wet scrubber has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a wet scrubber to control PM emissions from the heater.

Cyclone
The PM_{10}-only profile of the heater's PM emissions would limit the control effectiveness of a cyclone. Additionally, the PM_{10} concentration in the heater's exhaust stream will be below the concentration typically seen in a cyclone's exhaust stream. Thus, a cyclone would not lower the heater's PM_{10} emissions by any appreciable amount. Furthermore, research of EPA's RBLC database indicates a cyclone has not been used to control PM emissions from a comparable heater. These factors indicate it would not be technically feasible to use a cyclone to control PM emissions from the heater.

Step 3: Rank Remaining Control Technologies
The only remaining available PM, PM_{10}, and $PM_{2.5}$ emission control technology for the Hot Oil Heater (H-4201) is good combustion practices.

Step 4: Evaluate Most Effective Control Technologies
The only remaining available PM, PM_{10}, and $PM_{2.5}$ emission control technology for the Hot Oil Heater (H-4201) is good combustion practices.

Step 5: Select BACT
MRL determined that good combustion practices represent the maximum air pollution control capability for the PM, PM_{10}, and $PM_{2.5}$ emissions from the Hot Oil Heater (H-4201). Therefore, MRL will control PM, PM_{10}, and $PM_{2.5}$ emissions from the heater by using good combustion practices.

SO_2

The Hot Oil Heater (H-4201) will combust pipeline quality natural gas, which will contain negligible levels of sulfur-containing compounds. Therefore, the heater will emit only a small amount of SO_2 due to natural gas combustion.

The heater will not be subject to an NSPS SO_2 emission standard. However, it will be subject to the following DEQ SO_2 emission standard.

Pursuant to ARM 17.8.322(5), the heater shall not burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 ft^3 of gaseous fuel, calculated as H2S at standard conditions (or approximately 808 ppmv H_2S).

Step 1: Identify Control Technologies
The following are available SO_2 emission control technologies for the Hot Oil Heater (H- 4201).

Low Sulfur Fuel -See page 22

Flue Gas Desulfurization See page 23

Step 2: Eliminate Technically Infeasible Options
Low Sulfur Fuel is technically feasible.

Flue Gas Desulfurization
The heater will emit SO_2 at negligible concentrations, considerably below the concentrations oftentimes seen in a wet scrubber's exhaust stream. Additionally, the liquid carryover in the exhaust stream from a wet scrubber or the solid carryover in the exhaust stream from a semi-dry or dry scrubber would result in a new PM emission mechanism for the heater.

Moreover, research of EPA's RBLC database indicates wet, semi-dry, and dry scrubbers have not been used to control SO_2 emissions from a comparable heater. These factors indicate it would not be technically feasible to use flue gas desulfurization technologies to control SO_2 emissions from the heater

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The only remaining available SO_2 emission control technology for the Hot Oil Heater (H- 4201) is low sulfur fuel.

Step 4: Evaluate Most Effective Control Options
The only remaining available SO_2 emission control technology for the Hot Oil Heater (H- 4201) is low sulfur fuel.

Step 5: Select BACT
MRL determined that combusting low sulfur gaseous fuel represents the maximum air pollution control capability for the SO_2 emissions from the Hot Oil Heater (H-4201).Specifically, MRL will control SO_2 emissions from the Hot Oil Heater (H-4201) by combusting pipeline quality natural gas.

VOC

The Hot Oil Heater (H-4201) will emit VOC due to the incomplete oxidation of hydrocarbons present in the heater's pipeline quality natural gas fuel. However, the low molecular weight characteristic of the hydrocarbons in the natural gas will promote low levels of VOC emissions from the heater.

Furthermore, the heater will be equipped with an oxygen monitoring system, which will allow the plant to make on-line optimization adjustments to the heater's combustion process, as needed. This system will greatly assist in minimizing the heater's VOC emissions by providing the plant with the capability to maintain good combustion practices at the heater.

The heater will not be subject to an NSPS or NESHAP VOC emission standards. However, it will be subject to the following NESHAP Subpart DDDDD work practice standards that will minimize its VOC emissions.

Pursuant to 40 CFR 63.7540(a)(10)(i), MRL will inspect the heater's burner(s), and clean or replace any components of the burner(s) as necessary.

Pursuant to 40 CFR 63.7540(a)(10)(ii), MRL will inspect the flame pattern of the heater's burner(s) and adjust the burner(s) as necessary to optimize the flame pattern, consistent with the manufacturer's specifications.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for the Hot Oil Heater (H- 4201).

Good Combustion Practices

Thermal Oxidation

Catalytic Oxidation

Below, these technologies are generally described.

Good Combustion Practices
Please see page 13 discussion.

Thermal Oxidation
Please see page 13 discussion.

Catalytic Oxidation
Please see page 13 discussion.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the VOC emission control technologies determined to be available for the Hot Oil Heater (H-4201) is evaluated below.

Good Combustion Practices
Good combustion practices will be an integral component of the design and operation of the heater. Therefore, this option is technically feasible for the heater

Thermal Oxidation
Thermal oxidation is not technically feasible for the control of VOC emissions from the heater due to the very low concentration of VOC expected to be present in its exhaust stream. The application of thermal oxidation to reduce the heater's VOC emission rate would require the combustion of a considerable amount of fuel to achieve the elevated temperature necessary to promote the oxidation of the small amount of VOC that will be present in the heater's exhaust stream. This fuel combustion would generate additional combustion pollutants, including VOC. Thus, the VOC emission reduction effectiveness of the thermal oxidation system would be reduced, if not negated, because of the VOC generated by the thermal oxidation process.

In summary, the addition of a second thermal oxidation process to the heater system may not reduce the heater's VOC emissions by any appreciable amount, if at all, and this add-on control technology would considerably increase the energy requirements of the heater system while notably increasing the amount of combustion pollutants, such as NOx and CO2, emitted into the atmosphere. Furthermore, research of EPA's RBLC database indicates thermal oxidation has not been used to control VOC emissions from a comparable heater. These factors indicate it is not technically feasible to use thermal oxidation to control VOC emissions from the heater.

Catalytic Oxidation
Catalytic oxidation is not technically feasible for the control of VOC emissions from the heater because its exhaust gas temperature will be too low for the effective operation of the oxidation catalyst. The optimum temperature range for catalytic oxidation is 850 to 1,100°F. Below temperatures of 500 to 600°F, the VOC removal efficiency of the oxidation catalyst is considerably reduced. As previously discussed, the heater's convection section will incorporate heat recovery to heat hot oil. The exhaust gas temperature after this heat recovery operation will not be optimal for catalytic oxidation. Moreover, due to the considerably low concentration of VOC in the heater's exhaust stream, the potential effectiveness of a catalytic oxidation system would be limited in this case.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The only remaining available VOC emission control technology for the Hot Oil Heater (H- 4201) is good combustion practices.

Step 4: Evaluate Most Effective Control Options
The only remaining available VOC emission control technology for the Hot Oil Heater (H- 4201) is good combustion practices.

Step 5: Select BACT
MRL determined that good combustion practices represent the maximum air pollution control capability for the VOC emissions from the Hot Oil Heater (H-4201). Therefore, MRL will control VOC emissions from the heater by using good combustion practices

Tank #306

VOC

Tank #306 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

The storage tank will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #306.

Internal Floating Roof (IFR) Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described.

IFR Storage Tank with Vapor Collection System and Control Device
An IFR storage tank is equipped with two roofs – a fixed roof connected to the top of the storage tank wall and a floating roof (the IFR) that rests on the surface of the liquid contained in the storage tank. In general, a floating roof design effectively eliminates the breathing and working emissions that result from a fixed roof storage tank because the floating roof eliminates the vapor space that would be present in a fixed roof tank by directly contacting nearly all of the liquid surface area. Additionally, certain emissions mechanisms and floating roof operating and maintenance risks that exist for an EFR tank (a tank where the floating roof is exposed to the atmosphere) do not exist for an IFR tank because the IFR tank's floating roof is not directly exposed to the atmosphere since the tank's fixed roof is located above the floating roof.

Because an IFR tank incorporates a fixed roof above a floating roof, the vapor between the floating roof and fixed roof can be collected and routed to a control device to reduce VOC emissions to the atmosphere. The following are examples of the types of control devices that can be used to reduce VOC emissions from the vapor collected from an IFR tank:

Condenser;

Thermal oxidizer; and

Carbon adsorption.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
A fixed roof storage tank contains a vapor space between the surface of the liquid contained in the tank and the roof of the tank, and this vapor space is partially comprised of the compounds making up the liquid contained in the tank. A portion of the vapor contained in the vapor space of an atmospheric fixed roof storage tank is routinely vented to the atmosphere because of the breathing and working emissions mechanisms described above.

A fixed roof tank can be equipped with a vapor collection system to collect the vapor vented from the tank. This collected vapor can then be routed to a control device to reduce VOC emissions to the atmosphere. The following are examples of the types of control devices that can be used to reduce VOC emissions from the vapor collected from a fixed roof tank:

Condenser;

Thermal oxidizer; and

Carbon adsorption.

IFR Storage Tank
As described above, an IFR storage tank is equipped with two roof structures – a fixed roof located above a floating roof (the IFR). In general, a floating roof design effectively eliminates the breathing and working emissions that result from a fixed roof storage tank because the floating roof eliminates the vapor space that would be present in a fixed roof tank by directly contacting nearly all of the liquid surface area. Additionally, certain emissions mechanisms and floating roof operating and maintenance risks that exist for an EFR tank do not exist for an IFR tank because the IFR tank's floating roof is not directly exposed to the atmosphere since the tank's fixed roof is located above its floating roof. As a result, emissions from an IFR tank are typically lower than the emissions that would occur from an otherwise identical EFR tank containing the same material at the same storage conditions.

EFR Storage Tank
An EFR storage tank is equipped with a roof structure that rests on the surface of the liquid contained in the storage tank, and this floating roof is exposed to the atmosphere. As discussed above for an IFR tank, a floating roof design effectively eliminates the breathing and working emissions that result from a fixed roof storage tank. However, emissions from an EFR tank tend to be higher than from an IFR tank because the rim seal and openings of an EFR tank are directly exposed to the atmosphere and, therefore, the emissions from these seals and openings are influenced by wind conditions.

Fixed Roof Storage Tank with Submerged Fill
There are two mechanisms that result in emissions from a fixed roof storage tank. The first mechanism results in breathing emissions, while the second mechanism results in working emissions. By incorporating submerged fill into the design of a fixed roof storage tank, the saturation level of the vapor space between the surface of the liquid contained in the tank and the roof of the tank can be reduced versus the level that would occur if the liquid were introduced into the tank under splash loading conditions. Therefore, by reducing the saturation level of the vapor space, the vapor vented from the storage tank contains less VOC, which means lower VOC emissions to the atmosphere.

Step 2: Eliminate Technically Infeasible Options
IFR Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

IFR Storage Tank
This option is technically feasible for the tank.

EFR Storage Tank
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill
Fixed roof with submerged fill will be an integral component of the base design and operation of the tank. Therefore, this option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates a fixed roof and submerged fill.

Step 4: Evaluate Most Effective Control Options
Below, we evaluate the cost effectiveness of the installation and operation of the VOC emission control technologies that were determined to be technically feasible for the tank but not already included in its base design.

IFR Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. Also, the plant would be required to expend at least $1,250,000 to install piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the IFR tank's VOC emissions. Furthermore, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank and vapor collection and control system on the IFR tank, MRL concluded that it would not be cost effective to install an IFR storage tank equipped with a vapor collection and control system. Therefore, MRL eliminated an IFR storage tank with a vapor

collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation of piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the tank's VOC emissions would cost at least $1,250,000, which is not cost effective in consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank without any vapor collection system and control device. Additionally, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

The tank's VOC emissions cannot be safely routed to the adjacent CMR Great Falls Refinery's flare system because that flare system's pressure is too high. Therefore, a new combustion control device, such as a thermal oxidizer, would be required to be installed to safely treat the tank's VOC emissions.

IFR Storage Tank
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank, MRL concluded that it would not be cost effective to install an IFR storage tank. Therefore, MRL eliminated an IFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

EFR Storage Tank
MRL estimated that the installation and operation of an EFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an EFR storage tank, MRL concluded that it would not be cost effective to install an EFR storage tank. Therefore, MRL eliminated an EFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Step 5: Select BACT
MRL determined that a fixed roof with submerged fill represents the maximum air pollution control capability for the VOC emissions from Tank #306. Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and submerged fill design.

Tank #307

VOC

Tank #307 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

The storage tank will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #307.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described.

IFR Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

Fixed Roof Storage Tank with Vapor Collection System and Control Device Please see page 35 herein for a discussion of this technology.

IFR Storage Tank
Please see page 36 for a discussion of this technology.

EFR Storage Tank
Please see page 36 for a discussion of this technology.

Fixed Roof Storage Tank with Submerged Fill
Please see page 36 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for Tank #307.

IFR Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

IFR Storage Tank
This option is technically feasible for the tank.

EFR Storage Tank
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill

Fixed roof with submerged fill will be an integral component of the base design and operation of the tank. Therefore, this option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates a fixed roof and submerged fill.

Step 4: Evaluate Most Effective Control Options
Below, we evaluate the cost effectiveness of the installation and operation of the VOC emission control technologies that were determined to be technically feasible for the tank but not already included in its base design.

IFR Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. Also, the plant would be required to expend at least $1,250,000 to install piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the IFR tank's VOC emissions.53, 54 Furthermore, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank and vapor collection and control system on the IFR tank, MRL concluded that it would not be cost effective to install an IFR storage tank equipped with a vapor collection and control system. Therefore, MRL eliminated an IFR storage tank with a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

The tank's VOC emissions cannot be safely routed to the adjacent CMR Great Falls Refinery's flare system because that flare system's pressure is too high. Therefore, a new combustion control device, such as a thermal oxidizer, would be required to be installed to safely treat the tank's VOC emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation of piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the tank's VOC emissions would cost at least $1,250,000, which is not cost effective in consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank without any vapor collection system and control device. Additionally, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

IFR Storage Tank
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank, MRL concluded that it would not be cost effective to install an IFR storage tank. Therefore, MRL eliminated an IFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

EFR Storage Tank
MRL estimated that the installation and operation of an EFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 0.87 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an EFR storage tank, MRL concluded that it would not be cost effective to install an EFR storage tank. Therefore, MRL eliminated an EFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Step 5: Select BACT
MRL determined that a fixed roof with submerged fill represents the maximum air pollution control capability for the VOC emissions from Tank #307. Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and submerged fill design.

Tank #308

VOC

Tank #308 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

The storage tank will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #308.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described.
IFR Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

Fixed Roof Storage Tank with Vapor Collection System and Control Device.
IFR Storage Tank
Please see page 36 for a discussion of this technology.

EFR Storage Tank
Please see page 36 herein for a discussion of this technology.

Fixed Roof Storage Tank with Submerged Fill
Please see page 36 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for Tank #308.

IFR Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Vapor Collection System and Control Device This option is technically feasible for the tank.

IFR Storage Tank
This option is technically feasible for the tank.

EFR Storage Tank
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill
Fixed roof with submerged fill will be an integral component of the base design and operation of the tank. Therefore, this option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates a fixed roof and submerged fill.

Step 4: Evaluate Most Effective Control Options
Below, we evaluate the cost effectiveness of the installation and operation of the VOC emission control technologies that were determined to be technically feasible for the tank but not already included in its base design.

IFR Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. Also, the plant would be required to expend at least$1,250,000 to install piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the IFR tank's VOC emissions.55, 56 Furthermore, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank and vapor collection and control system on the IFR tank, MRL concluded that it would not be cost effective to install an IFR storage tank equipped with a vapor collection and control system. Therefore, MRL eliminated an IFR storage tank with a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation of piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the tank's VOC emissions would cost at least $1,250,000, which is not cost effective in consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank without any vapor collection system and control device. Additionally, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

IFR Storage Tank
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank, MRL concluded that it would not be cost effective to install an IFR storage tank. Therefore, MRL eliminated an IFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

EFR Storage Tank
MRL estimated that the installation and operation of an EFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an EFR storage tank, MRL concluded that it would not be cost effective to install an EFR storage tank. Therefore, MRL eliminated an EFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Step 5: Select BACT
MRL determined that a fixed roof with submerged fill represents the maximum air pollution control capability for the VOC emissions from Tank #308. Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and submerged fill design.

Tank #309

VOC

Tank #309 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

The storage tank will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #309.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described.
IFR Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank
Please see page 36 for a discussion of this technology.

EFR Storage Tank
Please see page 36 for a discussion of this technology.

Fixed Roof Storage Tank with Submerged Fill
Please see page 36 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for Tank #309.

IFR Storage Tank with Vapor Collection System and Control Device This option is technically feasible for the tank.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
This option is technically feasible for the tank.

IFR Storage Tank
This option is technically feasible for the tank.

EFR Storage Tank
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill
Fixed roof with submerged fill will be an integral component of the base design and operation of the tank. Therefore, this option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates a fixed roof and submerged fill.

Step 4: Evaluate Most Effective Control Options
Below, we evaluate the cost effectiveness of the installation and operation of the VOC emission control technologies that were determined to be technically feasible for the tank but not already included in its base design.

IFR Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. Also, the plant would be required to expend at least $1,250,000 to install piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the IFR tank's VOC emissions. Furthermore, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank and vapor collection and control system on the IFR tank, MRL concluded that it would not be cost effective to install an IFR storage tank equipped with a vapor collection and control system. Therefore, MRL eliminated an IFR storage tank with a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
MRL estimated that the installation of piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the tank's VOC emissions would cost at least $1,250,000, which is not cost effective in consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank without any vapor collection system and control

device. Additionally, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the thermal oxidizer would make it even less cost-effective. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

IFR Storage Tank
MRL estimated that the installation and operation of an IFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an IFR storage tank, MRL concluded that it would not be cost effective to install an IFR storage tank. Therefore, MRL eliminated an IFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

EFR Storage Tank
MRL estimated that the installation and operation of an EFR storage tank would be more costly than a fixed roof tank. In consideration of the minor 1.75 tpy VOC emission rate calculated for a fixed roof version of the tank and the higher costs to install and operate an EFR storage tank, MRL concluded that it would not be cost effective to install an EFR storage tank. Therefore, MRL eliminated an EFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Step 5: Select BACT
MRL determined that a fixed roof with submerged fill represents the maximum air pollution control capability for the VOC emissions from Tank #309. Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and submerged fill design.

Tank #0801

VOC

Tank #0801 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

The storage tank will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #0801.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described.
IFR Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

Fixed Roof Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

IFR Storage Tank
Please see page 36 for a discussion of this technology.

EFR Storage Tank
Please see page 36 for a discussion of this technology.

Fixed Roof Storage Tank with Submerged Fill
Please see page 36 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for Tank #0801.

IFR Storage Tank with Vapor Collection System and Control Device This option is technically feasible for the tank.

Fixed Roof Storage Tank with Vapor Collection System and Control Device This option is technically feasible for the tank.

IFR Storage Tank
This option is technically feasible for the tank.

EFR Storage Tank
This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill
Fixed roof with submerged fill will be an integral component of the base design and operation of the tank. Therefore, this option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

IFR Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Vapor Collection System and Control Device

IFR Storage Tank

EFR Storage Tank

Fixed Roof Storage Tank with Submerged Fill: this control technology was incorporated into the emissions unit's baseline emissions because the unit's design basis incorporates a fixed roof and submerged fill.

Step 4: Evaluate Most Effective Control Options
Below, we evaluate the cost effectiveness of the installation and operation of the VOC emission control technologies that were determined to be technically feasible for the tank but not already included in its base design.

IFR Storage Tank with Vapor Collection System and Control Device
In consideration of the negligible 0.02 tpy VOC emission rate calculated for a fixed roof version of the tank, MRL concluded that it would not be cost effective to install and operate an IFR storage tank equipped with a vapor collection and control system. Therefore, MRL eliminated an IFR storage tank with a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device
In consideration of the negligible 0.02 tpy VOC emission rate calculated for a fixed roof version of the tank without any vapor collection system and control device, MRL concluded that it would not be cost effective to install and operate a vapor collection and control system on the tank. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the tank's VOC emissions.

IFR Storage Tank
In consideration of the negligible 0.02 tpy VOC emission rate calculated for a fixed roof version of the tank, MRL concluded that it would not be cost effective to install and operate an IFR version of the storage tank. Therefore, MRL eliminated an IFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

EFR Storage Tank
In consideration of the negligible 0.02 tpy VOC emission rate calculated for a fixed roof version of the tank, MRL concluded that it would not be cost effective to install and operate an EFR version of the storage tank. Therefore, MRL eliminated an EFR storage tank from consideration as the maximum air pollution control capability for the tank's VOC emissions.

Step 5: Select BACT
MRL determined that a fixed roof with submerged fill represents the maximum air pollution control capability for the VOC emissions from Tank #0801. Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and submerged fill design.

Tank #4201

VOC

Tank #4201 will be an atmospheric fixed roof storage tank storing a VOC-containing material. The emissions mechanisms for the storage tank will be the following two mechanisms: (1) the contraction and expansion of the vapor in the vapor space of the tank caused by operating temperature fluctuations; and (2) the hydraulic displacement of vapor caused by cyclic increases in the tank's liquid level. The first mechanism results in breathing emissions, while the second mechanism results in working emissions.

Tank #4201 will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for Tank #4201.

Fixed Roof Storage Tank with Vapor Collection System and Control Device

Fixed Roof Storage Tank with Submerged Fill Below, these technologies are generally described. A floating roof is generally not an available technology for Tank #4201 because of the waxy or fatty physical characteristic of the organic material that will be contained in the PTU wastewater. This characteristic would negatively impact the operability of a floating roof, including the effectiveness of the roof's seals.

Fixed Roof Storage Tank with Vapor Collection System and Control Device Please see page 35 for a discussion of this technology.

Fixed Roof Storage Tank with Submerged Fill
Please see page 36 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for Tank #4201.

Fixed Roof Storage Tank with Vapor Collection System and Control Device This option is technically feasible for the tank.

Fixed Roof Storage Tank with Submerged Fill This option is technically feasible for the tank.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The remaining available VOC emission control technologies for the tank are listed below from the highest to lowest potential emission control relative to the emissions unit's baseline emissions.

Fixed Roof Storage Tank with Vapor Collection System and Control Device: this control technology was incorporated into the emissions unit's baseline emissions because the unit will be equipped with a fixed roof with vapor collection system and control device.

Fixed Roof Storage Tank with Submerged Fill

Step 4: Evaluate Most Effective Control Options
MRL will install and operate the most effective control technology on Tank #4201. Therefore, it is not necessary to analyze control technology options for the tank.

Step 5: Select BACT
MRL determined that a fixed roof with a carbon adsorption control device represents the maximum air pollution control capability for the VOC emissions from Tank #4201.Therefore, MRL will control VOC emissions from the tank by equipping it with a fixed roof and a carbon adsorption control device.

Hot Oil Expansion Tank (D-4203)

VOC

The Hot Oil Expansion Tank (D-4203) will have the potential to emit VOC to the atmosphere, but it is expected to infrequently vent to the atmosphere for the following reasons:

The vessel will be a pressurized vessel equipped with a pressure regulating valve and the setpoint of this valve will limit the amount of venting from the vessel;

The hot oil level in the vessel is expected to stay relatively constant during routine operations because the vessel will be part of a recirculation circuit in which the recirculating hot oil will typically bypass the vessel; and

The hot oil temperature in the vessel is expected to stay relatively constant during routine operations, again because the vessel will be part of a recirculation circuit in which the recirculating hot oil will typically bypass the vessel.

The process vessel will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for the Hot Oil Expansion Tank (D-4203).

Thermal Oxidation

Catalytic Oxidation

Absorption

Carbon Adsorption

Condensation

Proper Equipment Design and Operating Practices Below, the available technologies are generally described.
Thermal Oxidation

Please see page 13 for a discussion of this technology.

Catalytic Oxidation
Please see page 13 for a discussion of this technology.

Absorption
Absorption is primarily a physical process, though it can also include a chemical component, in which a pollutant in a gas phase contacts a scrubbing media and is removed from the gas phase by the scrubbing media. The common absorption device used to remove VOC from a gaseous stream is a wet scrubber. The wet scrubber provides an intimate contacting environment for the soluble VOC to be dissolved in the scrubbing liquid. Water can be used as the scrubbing liquid in a wet scrubber used for VOC emission control, but very low vapor pressure organic materials are also

used when the VOC requiring control is not soluble in water. In general, VOC containing nitrogen or oxygen atoms that are free to form strong hydrogen bonds and that have one to three carbon atoms are soluble in water. As the number of carbon atoms increases, the VOC is typically less soluble in water to a point where it is insoluble in water. There are several types of wet scrubbers, including packed- bed counterflow scrubbers, packed-bed cross-flow scrubbers, bubble plate scrubbers, and tray scrubbers.

Carbon Adsorption

Carbon adsorption is used to capture a specific compound, or a range of compounds, present in a gas phase on the surface of granular activated carbon. Carbon adsorption performance depends on the type of activated carbon used, the characteristics of the target compound(s), the concentration of the target compound(s) in the gaseous stream, and the temperature, pressure, and moisture content of the gaseous stream. Carbon adsorbers can be of the fixed-bed or fluidized bed design. A fixed-bed carbon adsorber must be periodically regenerated to desorb the collected compounds from the carbon, while a fluidized-bed carbon adsorber is continuously regenerated. Additionally, portable, easily replaceable carbon adsorption units (e.g., 55-gallon drums) are used in some applications. This type of unit is not regenerated at the facility where it is used. Instead, the portable unit is typically returned to the supplier of the unit, and the supplier regenerates or disposes of the spent carbon.

Condensation

In principle, a condenser achieves condensation by lowering the temperature of the gas stream containing a condensable to a temperature at which the desired condensate's vapor pressure is lower than its entering partial pressure. Condensation is performed by a condenser that is either a surface noncontact condenser or a direct-contact condenser. A surface condenser is usually a shell-and-tube heat exchanger in which the cooling fluid flows inside the tubes of the exchanger and the gas undergoing condensation treatment flows on the outside of the tubes. A direct-contact condenser is a device in which intimate contact occurs between the cooling fluid and the gas undergoing condensation treatment, usually in a spray or packed tower. Although a direct-contact condenser may also be part of a chemical recovery system, an extra separation step is usually required to separate the cooling liquid from the newly formed condensate. Examples of cooling fluids used in condensers are water, brine cooled to below the freezing point of pure water, and refrigerants.

Proper Equipment Design and Operating Practices

As discussed above, the process vessel will be designed and operated to minimize venting episodes. Therefore, the amount of VOC emissions from the vessel will be low.

Step 2: Eliminate Technically Infeasible Options

The technical feasibility of the VOC emission control technologies determined to be available for the Hot Oil Expansion Tank (D-4203) is evaluated below.

Thermal Oxidation

This option is technically feasible for the process vessel.

Catalytic Oxidation

This option is technically feasible for the process vessel.

Absorption

This option is technically feasible for the process vessel.

Carbon Adsorption

This option is technically feasible for the process vessel.

Condensation
This option is technically feasible for the process vessel.

Proper Equipment Design and Operating Practices This option is technically feasible for the process vessel.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The available add-on VOC emission control technologies for the Hot Oil Expansion Tank (D-4203) are all effectively the same with respect to VOC emission control capabilities. The different technologies do however have varying energy requirements (e.g., electricity and fuel) and generate unique waste products (e.g., wastewater, solid waste, or combustion emissions).

Step 4: Evaluate Most Effective Control Options
As noted above, the available add-on VOC emission control technologies are all effectively the same with respect to VOC emission control capabilities. However, in consideration of the negligible 0.01 tpy potential to emit VOC emission rate calculated for the Hot Oil Expansion Tank (D-4203), MRL concluded that it would not be cost effective to install and operate of any of these control technologies on the process vessel. Additionally, the add-on control technologies would require electricity and/or fuel to operate, which would likely result in the emission of combustion pollutants, such as NOx and CO2, into the atmosphere. Furthermore, several of the control technologies would result in the generation of waste streams. For these reasons, MRL eliminated the add-on control technologies from consideration as the maximum air pollution control capability for the vessel's VOC emissions.

Step 5: Select BACT
MRL determined that proper equipment design and operating practices represents the maximum air pollution control capability for VOC emissions from the Hot Oil Expansion Tank (D-4203). Therefore, MRL will control VOC emissions from the Hot Oil Expansion Tank (D- 4203) by properly designing and operating the process vessel.

PTU Blowdown Drum (D-4208)
The maximum air pollution control capability determination made for this emissions unit pursuant to ARM 17.8.752 is presented below.

VOC
The PTU Blowdown Drum (D-4208) will periodically receive renewable feed and renewable feed-water mixtures due to PTU equipment maintenance and PTU turnaround events. VOC emissions will occur due to the volatilization of organic compounds from the material handled by the vessel.

The process vessel will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for the PTU Blowdown Drum (D-4208).

Thermal Oxidation

Catalytic Oxidation

Absorption

Carbon Adsorption

Condensation

Below, the available technologies are generally described.

Thermal Oxidation
Please see page 13 for a discussion of this technology.

Catalytic Oxidation
Please see page 13 for a discussion of this technology.

Absorption
Please see page 51 for a discussion of this technology.

Carbon Adsorption
Please see page 50 for a discussion of this technology.

Condensation
Please see page 51 for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
Below, we evaluate the technical feasibility of the VOC emission control technologies determined to be available for the PTU Blowdown Drum (D-4208).

Thermal Oxidation
This option is technically feasible.

Catalytic Oxidation
This option is technically feasible.

Absorption
This option is technically feasible.

Carbon Adsorption
This option is technically feasible.

Condensation
This option is technically feasible.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The available add-on VOC emission control technologies for the PTU Blowdown Drum (D- 4208) are all effectively the same with respect to VOC emission control capabilities. The different technologies do however have varying energy requirements (e.g., electricity and fuel) and generate unique waste products (e.g., wastewater, solid waste, or combustion emissions).

Step 4: Evaluate Most Effective Control Options
As noted above, the available add-on VOC emission control technologies are all effectively the same with respect to VOC emission control capabilities. Although the uncontrolled potential to emit VOC emission rate calculated for the PTU Blowdown Drum (D-4208) will be negligible, MRL will install a carbon adsorption control device to minimize the vessel's VOC emissions.

Step 5: Select BACT
MRL determined that carbon adsorption represents the maximum air pollution control capability for VOC emissions from the PTU Blowdown Drum (D-4208). Therefore, MRL will control VOC emissions from the vessel by equipping it with a carbon adsorption control device.

PTU Piping Fugitive Components
The maximum air pollution control capability determination made for these sources pursuant to ARM 17.8.752 is presented below.

VOC
Some of the PTU piping fugitive components (pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, and flanges or other connectors) will handle material that contains VOC. These components will have the potential to emit VOC if they develop a leak to the atmosphere. For example, valves and pumps can develop leaks because of the degradation or failure of seal systems that are designed to prevent material handled by these components from leaking to the atmosphere. A valve's seal system is associated with its stem, which is used to adjust the valve's position. A pump's seal system is associated with its shaft, which is used to provide the pump's pumping action.

The PTU piping fugitive components will not be subject to an NSPS or NESHAP.

Step 1: Identify Control Technologies
MRL determined that equipment design and leak detection and repair (LDAR) practices are available VOC emission control technologies for the PTU piping fugitive components. A general description of these technologies is provided below.

Equipment Design and LDAR
Equipment design examples used to minimize piping component leaks include: (1) a cap, plug, or second valve on an open-ended line; (2) a dual mechanical seal on a pump; and (3) a rupture disk assembly on a pressure relief valve. These types of design features are reasonably priced and tend to be relatively easy and efficient to operate and maintain.

LDAR programs are used to identify piping components leaking material at a level warranting component repair (or replacement), and the effectiveness of these programs has been well established throughout many different industries over several decades. The primary features of an LDAR program are leak monitoring frequency, leak detection level, and timely leak repair requirements. A piping component may be checked for leakage by visual, audible, olfactory, or instrument techniques. For example, visual inspections may be used to identify leaks of heavy liquid material from connectors, valves, and pumps.
Alternatively, a portable hydrocarbon detection instrument is typically used to identify (and measure) leaks of gases and light liquid materials from piping components. After a leak is detected, then the leak must typically be repaired within a specific time period, followed by a subsequent leak inspection to ensure the leaking component was properly repaired.

For comparison to these practical equipment designs and LDAR practices, the use of a control device (e.g., flare, thermal oxidizer, carbon adsorption device) to control emissions from hundreds or thousands of connectors, valves, and pumps located across a wide area in a process unit is not reasonably applicable because a substantial amount of piping and ductwork would be required to collect the component leaks, the positive pressure leak collection piping and ductwork would have the potential to leak to the atmosphere, and potentially substantial amounts of collateral combustion emissions or solid waste would be generated by the control device(s). Therefore, this type of collection and control scheme is not further evaluated.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the VOC emission control technologies that were determined to be available for the PTU piping fugitive components is evaluated below.

Equipment Design and LDAR
Equipment design and LDAR will be used for the PTU piping fugitive components. Therefore, this option is technically feasible.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The only remaining available VOC emission control technology for the PTU piping fugitive components is the combination of equipment design and LDAR.

Step 4: Evaluate Most Effective Control Options
The only remaining available VOC emission control technology for the PTU piping fugitive components is the combination of equipment design and LDAR.

Step 5: Select BACT
MRL determined that a combination of equipment design and LDAR represents the maximum air pollution control capability for the PTU piping fugitive component VOC emissions pursuant to ARM 17.8.752. Specifically, MRL will control VOC emissions from the PTU piping fugitive components by complying with the following equipment design and LDAR requirements.

The PTU piping fugitive components will comply with the following requirements.

The components "in VOC service" will comply with the equipment leak provisions found in 40 CFR 60.482–1a through 60.482–10a

PTU Wastewater Components

VOC

The PTU wastewater components may handle wastewater containing hydrocarbons. These components will have the potential to emit VOC. For example, VOC contained in the vapor space of a drain system can be emitted to the atmosphere from an open drain riser, from the surface of a drain's water seal, or by diffusion through a drain's water seal.

The PTU wastewater components will be subject to NESHAP Subpart FF.

Step 1: Identify Control Technologies
MRL determined that equipment design features and equipment monitoring and maintenance practices are available VOC emission control technologies for the PTU wastewater components. A general description of these technologies is provided below.

Equipment Design, Monitoring, and Maintenance
Designing a drain riser with a water seal significantly reduces the ability of the VOC contained in the vapor space of the drain system to be emitted to the atmosphere from the riser. This drain design feature is reasonably priced and tends to be relatively easy and efficient to maintain by periodically monitoring the water seal liquid level and adding water to the seal as necessary. Similarly, equipping a junction box with a tightly sealed cover and a relatively small vent pipe effectively limits the amount of VOC that may be emitted from the junction box. Also, junction boxes are usually easily accessible for periodic inspection to ensure the cover is properly positioned and the tight seal around the edge of the cover is maintained.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the VOC emission control technologies that were determined to be available for the PTU wastewater components is evaluated below.

Equipment Design, Monitoring, and Maintenance
Equipment design, monitoring, and maintenance will be used for the PTU wastewater components. Therefore, this option is technically feasible.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The only remaining available VOC emission control technology for the PTU wastewater components is the application of proper equipment design, monitoring, and maintenance.

Step 4: Evaluate Most Effective Control Options
The only remaining available VOC emission control technology for the PTU wastewater components is the application of proper equipment design, monitoring, and maintenance.

Step 5: Select BACT
MRL determined that a combination of equipment design features and equipment monitoring, and maintenance practices represents the maximum air pollution control capability for the PTU wastewater component VOC emissions pursuant to ARM 17.8.752. Specifically, MRL will control VOC emissions from the PTU wastewater components by complying with the following equipment design feature and equipment monitoring and maintenance practices requirements.

- The PTU wastewater components will comply with the following requirements.

- The PTU “individual drain systems,” “oil-water separators,” and “aggregate facilities” will comply with the provisions found in 40 CFR 60.692–1 through 60.692–7 of NSPS Subpart QQQ.

The components will comply with NESHAP Subpart FF.

Loading - Renewable Kerosene/Sustainable Aviation Fuel.

VOC

The Loading - Renewable Kerosene/Sustainable Aviation Fuel activity represents the loading of renewable kerosene or sustainable aviation fuel into railcars. Loading renewable kerosene or sustainable aviation fuel into a railcar will have the potential to result in VOC emissions to the atmosphere because of the displacement of VOC-containing vapor present in the railcar. Specifically, as renewable kerosene or sustainable aviation fuel is loaded into the railcar, the VOC laden vapor space in the railcar will be displaced and emitted directly to the atmosphere if a vapor collection system is not used during the loading operation.

The Loading - Renewable Kerosene/Sustainable Aviation Fuel activity will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies
The following are available VOC emission control technologies for the Loading - Renewable Kerosene/Sustainable Aviation Fuel activity:

Thermal Oxidation

Catalytic Oxidation

Absorption

Carbon Adsorption

Condensation

Submerged Fill Loading

Below, these technologies are generally described.

Thermal Oxidation
Please see page 13 for a discussion of this technology.

Catalytic Oxidation
Please see page 13 for a discussion of this technology.

Absorption
Please see page 50 for a discussion of this technology.

Carbon Adsorption
Please see page 50 for a discussion of this technology.

Condensation
Please see page 51 for a discussion of this technology.

Submerged Fill Loading
Please see page 35 herein for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the VOC emission control technologies determined to be available for the Loading Renewable Kerosene/Sustainable Aviation Fuel activity is evaluated below.

Thermal Oxidation
This option is technically feasible.

Catalytic Oxidation
This option is technically feasible.

Absorption
This option is technically feasible.

Carbon Adsorption
This option is technically feasible.

Condensation
This option is technically feasible.

Submerged Fill Loading
Submerged fill loading will be an integral component of the operation of the loading activity. Therefore, this option is technically feasible for the activity.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
The available add-on VOC emission control technologies for the Loading - Renewable Kerosene/Sustainable Aviation Fuel activity are all effectively the same with respect to VOC emission control capabilities. Alternatively, the submerged fill loading option would not be as effective as the add-on VOC emission control options.

Step 4: Evaluate Most Effective Control Options
As noted above, the available add-on VOC emission control technologies are all effectively the same with respect to VOC emission control capabilities. The different add-on control device technologies do however have varying energy requirements (e.g., electricity and fuel) and generate unique waste products (e.g., wastewater, solid waste, and combustion emissions).
MRL estimated that the installation of piping, associated equipment (e.g., valves and instrumentation), and a thermal oxidizer to collect and control the Loading - Renewable Kerosene/Sustainable Aviation Fuel activity's VOC emissions would cost at least $1,250,000, which is not cost effective in consideration of the minor 1.17 tpy VOC emission rate calculated for the activity.59 Additionally, annual operating costs (e.g., fuel, electricity, maintenance labor, and maintenance materials) required to operate and maintain the add- on control technology would make it even less cost-effective. Therefore, MRL eliminated a vapor collection system and control device from consideration as the maximum air pollution control capability for the activity's VOC emissions.

Step 5: Select BACT
MRL determined that submerged fill loading represents the maximum air pollution control capability for the VOC emissions from the Loading - Renewable Kerosene/Sustainable Aviation Fuel activity. Therefore, MRL will control VOC emissions from the loading activity by performing submerged fill loading.

Loading - PTU Wastewater

VOC

The Loading - PTU Wastewater activity represents the loading of PTU wastewater into tank trucks or railcars. Loading PTU wastewater into these vessels will have the potential to result in VOC emissions to the atmosphere because of the displacement of VOC-containing vapor present in the vessels. Specifically, as PTU wastewater is loaded into a vessel, the VOC laden vapor space in the vessel will be displaced and emitted directly to the atmosphere if a vapor collection system is not used during the loading operation.

The Loading - PTU Wastewater activity will not be subject to an NSPS or NESHAP VOC emission standard.

Step 1: Identify Control Technologies

The following are available VOC emission control technologies for the Loading - PTU Wastewater activity:

Thermal Oxidation

Catalytic Oxidation

Absorption

Carbon Adsorption

Condensation

Submerged Fill Loading

Below, these technologies are generally described.

Thermal Oxidation

Please see page 13 for a discussion of this technology.

Catalytic Oxidation

Please see page 13 for a discussion of this technology.

Absorption

Please see page 50 for a discussion of this technology.

Carbon Adsorption

Please see page 50 for a discussion of this technology.

Condensation

Please see page 51 for a discussion of this technology.

Submerged Fill Loading

Please see page 36 herein for a discussion of this technology.

Step 2: Eliminate Technically Infeasible Options
The technical feasibility of the VOC emission control technologies determined to be available for the Loading PTU Wastewater activity is evaluated below.

Thermal Oxidation
This option is technically feasible.

Catalytic Oxidation
This option is technically feasible.

Absorption
This option is technically feasible.

Carbon Adsorption
This option is technically feasible.

Condensation
This option is technically feasible.

Submerged Fill Loading This option is technically feasible.
Step 3: Rank Remaining Control Technologies by Control Effectiveness
The available add-on VOC emission control technologies for the Loading - PTU Wastewater activity are all effectively the same with respect to VOC emission control capabilities.
Alternatively, the submerged fill loading option would not be as effective as the add-on VOC emission control options.

Step 4: Evaluate Most Effective Control Options
As noted above, the available add-on VOC emission control technologies are all effectively the same with respect to VOC emission control capabilities. Although the uncontrolled potential to emit VOC emission rate calculated for the Loading - PTU Wastewater activity is considerably low, MRL will install a carbon adsorption control device to minimize VOC emissions from the loading activity.

Step 5: Select BACT
MRL determined that carbon adsorption represents BACT for VOC emissions from the Loading - PTU Wastewater activity. Therefore, MRL will control VOC emissions from the loading activity by installing and operating a carbon adsorption control device.

IV. Emission Inventory

To better describe the proposed emission changes occurring with this application, the following table presents the potential to emit from the earlier issued MAQP #5263-00, and the emissions being permitted under MAQP #5263-01, as well as the resulting changes between these permit versions. In every case except for SO_2, the additional equipment being added under MAQP #5263-01 results in minor increases in emissions. SO_2 emissions decrease under MAQP #5263-01 due to MRL accepting lower limits on the concentration of H_2S in some of the heaters.

	Potential to Emit (TPY)		
Pollutant	**MAQP #5263-00**	**MAQP #5263-01**	**Associated Change (TPY)**
CO	51.62	65.5	13.88
NOx	71.08	79.67	8.59
PM (filterable only)	2.09	2.47	0.38
PM_{10} (filt.+ cond.)	7.31	8.61	1.3
$PM_{2.5}$(filt.+ cond.)	7.24	8.54	1.3
SO_2	8.21	5.65	-2.56
VOC	80.63	95.53	14.9

Once all of the equipment is constructed and operating, the facility PTE is shown in the below table. The facility inventory indicates MRL will be below PSD thresholds for all permitted equipment.

MRL Great Falls Renewable Fuels Plant Regulated PSD Pollutant Potential to Emit Summary			
Pollutant	**Potential to Emit (tpy)**	**PSD Major Source Threshold[6] (tpy)**	**Subject to PSD Review (Yes/No)**
CO	65.50	100	No
NOx	79.67	100	No
PM (filterable only)	2.47	100	No
PM_{10}	8.61	100	No
$PM_{2.5}$	8.54	100	No
SO_2	5.65	100	No
VOC	95.53	100	No
GHGs, as CO_2e[7]	N/A	N/A	N/A

V. Existing Air Quality

As of July 8, 2002, Cascade County is designated as an Unclassifiable/Attainment area for all criteria pollutants.

VI. Ambient Air Impact Analysis

From a conventional pollutants standpoint, the emissions increases associated with the Renewable Feed Flexibility Project are minor decreases over the previously permitted levels for the MRL Great Falls Renewable Fuels Plant Projected increases over MAQP #5263-00 are less than 15 tpy each of the pollutants.

The Department determined that the project-related VOC, PM_{10}, $PM_{2.5}$, NO_2, and CO emissions will not cause or contribute to a violation of a federal or state ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Analysis Prepared By: Craig Henrikson
Date: May 16, 2022

DEPARTMENT OF ENVIRONMENTAL QUALITY
Air, Energy & Mining Division
Air Quality Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

Montana Renewables LLC

Environmental Assessment for

Montana Air Quality Permit #5263-01

Air Quality Bureau

APPLICANT: Montana Renewables LLC (MRL)		
SITE NAME: MRL Great Falls Renewable Fuels Plant		
PROPOSED PERMIT NUMBER: Montana Air Quality Permit Number 5263-01		
APPLICATION DATE: Received on 04/26/2022, Application Deemed Complete on 05/19/2022		
LOCATION: Lat/Long 47.522981, -111.295454		**COUNTY: Cascade**
PROPERTY OWNERSHIP:	**FEDERAL ____ STATE ____ PRIVATE _X___**	
EA PREPARER:	**Craig Henrikson**	
EA Draft Date	**EA Final Date**	**Permit Final Date**
05/26/2022	**06/21/2022**	**07/07/2022**

COMPLIANCE WITH THE MONTANA ENVIRONMENTAL POLICY ACT
The Montana Department of Environmental Quality (DEQ) prepared this Environmental Assessment (EA) in accordance with requirements of the Montana Environmental Policy Act (MEPA). An EA functions to determine the need to prepare an EIS through an initial evaluation and determination of the significance of impacts associated with the proposed action. However, an agency is required to prepare an EA whenever, as here, statutory requirements do not allow sufficient time for the agency to prepare an EIS (ARM 17.4.607.3.c). This document may disclose impacts over which DEQ has no regulatory authority.

COMPLIANCE WITH THE CLEAN AIR ACT OF MONTANA
The state law that regulates air quality permitting in Montana is the Clean Air Act of Montana, §§ 75-2-101, *et seq.*, (CAA) Montana Code Annotated (MCA). DEQ may not approve a proposed project contained in an application for an air quality permit unless the project complies with the requirements set forth in the CAA of Montana and the administrative rules adopted thereunder, ARMs 17.8.101 *et. seq*. The project is subject to approval by the DEQ Air Quality Bureau (AQB) as the potential project emissions exceed 25 tons per year for regulated pollutants (ARM 17.8.743.1.e). DEQ's approval of an air quality permit application does not relieve MRL from complying with any other applicable federal, state, or county laws, regulations, or ordinances. MRL is responsible for obtaining any other permits, licenses, or approvals (from DEQ or otherwise) that are required for any part of the proposed project.

Any action DEQ takes at this time is limited to the pending air quality permit application currently before DEQ's AQB and the authority granted to DEQ under the CAA of Montana—it is not indicative of any other action DEQ may take on any future (unsubmitted) applications made pursuant to any other authority (*e.g.* Montana's Water Protection Act). DEQ will decide whether to issue the pending air quality permit pursuant to the requirements of the CAA of Montana alone. DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Environmental Assessment. § 75-1-201(4), MCA.

SUMMARY OF THE PROPOSED ACTION: MRL has applied for a Montana air quality permit under the CAA of Montana for the following equipment. The permit action has been assigned Montana Air Quality Permit (MAQP) Number 5263-01. The proposed project would allow MRL to construct and operate a pretreatment unit which would allow lower quality raw materials to be processed at the site and add the ability to produce renewable kerosene and sustainable aviation fuel at the site. The proposed project would result in additional emissions due to the new and transferred equipment and therefore requires a modification to their existing MAQP. MRL was previously permitted under MAQP #5263-00 to install and operate equipment for the production of renewable fuels, and this revised MAQP expands MRL's capabilities to include pretreatment of raw materials and production of renewable kerosene and sustainable aviation fuel. The project for MAQP #5263-01 is identified as the Renewable Feed Flexibility Project.

Table 1: Proposed Action Details

Summary of Proposed Action	
General Overview	MRL's air quality permit application consists of the following new equipment and equipment transfers: Pretreatment Unit (PTU) including Deaerator, liquid-liquid separator, and blowdown process vessels Liquid reactors Heat exchangers Filters and static mixers; and Piping and piping components (pumps, valves, flanges, connectors, etc.). Hot Oil System including: Hot Oil Heater (H-4201) and Hot Oil Expansion Tank (D-4203 – Process Vessel)) PTU Wastewater Handling including: Tank #4201 Truck loading facility Railcar loading facility RDU side stripper for renewable kerosene production Piping (pumps, valves, flanges, connectors) and heat exchangers to handle and cool renewable kerosene

	Process vessels in the RDU to perform filtration, coalescence and drying of renewable kerosene Four new storage tanks to store renewable kerosene and sustainable aviation fuel (SAF) Tank #306 for storing renewable kerosene Tank #307 for storing renewable kerosene Tank #308 for storing renewable kerosene or sustainable aviation fuel Tank #309 for storing renewable kerosene or sustainable aviation fuel Tank #0801 for storing conventional diesel that will be blended with renewable diesel during railcar loading operations. MHC Fractionator Feed Heater (H-4102) (Transferred from Calumet Montana "Refining, LLC (CMR) (Now identified as RDU Fractionator Feed Heater (H-4102)) The facility would be permitted to emit from this equipment until MRL requested permit revocation or until the permit were revoked by DEQ due to gross non-compliance with the permit conditions.
Proposed Action Estimated Disturbance	
Disturbance	Disturbance for construction would be approximately 3-5 acres. Disturbance after construction would be approximately 3-5 acres.
Proposed Action	
Duration	**Construction:** Construction or commencement could start within three years of issuance of the final air quality permit otherwise the authority to construct expires. **Construction Period:** The construction period could begin as soon as the air quality permit (and any other required permits) were in place. Seasonal construction activities are allowed once a Department Application Completeness Determination has been issued. **Operation Life:** Renewable fuels equipment would be expected to last at least thirty years.
Construction Equipment	Typical construction equipment, including cranes, earth moving equipment (bulldozer, grader, frontend loader, trackhoe, etc.), forklifts, telehandlers, boring and drilling rigs.
Personnel Onsite	**Construction:** Approximately 200 to 300 construction personnel were originally indicated for MAQP #5263-00 but has resulted in up to 500 personnel on site. Construction needs for MAQP #5263-01 are likely to require an average of between 300 to 400 workers being on site. **Operations:** MAQP #5263-00 estimated ten to twenty new permanent staff during operation, and with MAQP #5263-01 up to an additional 30 permanent hourly employees are expected. Some additional professional staff hiring may also occur.
Location and Analysis Area	**Location**: The proposed project is located on existing property with an address of 1900 10th Street NE, Great Falls Montana 59404. This parcel is located within

	Section 1 of Township 20 North, Range 03 East. Adjacent and within the existing CMR Great Falls Refinery footprint as specified in Figure 1. Areas bordered in red represent disturbance areas and transferred equipment. **Analysis Area**: The area being analyzed as part of this environmental review includes the immediate project area (Figure 1), as well as neighboring lands surrounding the analysis area, as reasonably appropriate for the impacts being considered.
Air Quality	The Draft EA will be attached to the Preliminary Determination Air Quality Permit which would include all enforceable conditions for operation of the emitting units
Conditions incorporated into the Proposed Action	The conditions developed in the Decision (Air Quality Permit) of the Montana Air Quality Permit dated June21, 2022, set forth in Sections II.A-D.

Emission estimates for the project are located in Section IV. Emission Inventory in the Permit Analysis.

Two tables are shown in Section IV, the original PTE for the initial project under MAQP #5263-00, and the revised PTE for MAQP #5263-01 as well as the proposed emission changes occurring between the two permit versions. For MAQP #5263-01, the Renewable Feed Flexibility Project would provide for the following emission changes:

	Potential to Emit (TPY)		
Pollutant	**MAQP #5263-00**	**MAQP #5263-01**	**Associated Change (TPY)**
CO	51.62	65.5	13.88
NOx	71.08	79.67	8.59
PM (filterable only)	2.09	2.47	0.38
PM_{10} (filt . + cond.)	7.31	8.61	1.3
$PM_{2.5}$(filt. + cond.)	7.24	8.54	1.3
SO_2	8.21	5.65	-2.56
VOC	80.63	95.53	14.9

The site emissions for all pollutants would be less than 100 tons per year (tpy) with the highest emission level being VOCs, secondly, oxides of nitrogen (NOx) and third, carbon monoxide (CO). Particulate matter species and sulfur dioxide (SO_2) would each be less than 10 tpy.

The proposed action would be located on private land, within the City of Great Falls, Montana. All information included in the EA is derived from the permit application, discussions with the applicant, analysis of aerial photography, topographic maps, consultation with DEQ staff, and other research tools.

PURPOSE AND BENEFIT FOR PROPOSED ACTION: DEQ's purpose in conducting this environmental review is to act upon MRL's air quality permit application (MAQP #5263-01) for the purpose of treating raw materials and also to be able to produce renewable kerosene and sustainable aviation fuel in addition to the previously permitted renewable products including renewable diesel and renewable naphtha. These new processes must be permitted as they generate emissions regulated by DEQ.

The benefits of the proposed action, if approved, would allow MRL to construct and operate the proposed equipment at the proposed site to generate renewable fuel products for market. Authority to operate the proposed equipment would continue until the permit was revoked, either at the request of MRL or by DEQ because of non-compliance with the conditions within the air quality permit.

As the project scope has only changed slightly from the previous EA for MAQP #5263-00, the previous EA's conclusions are still largely representative for the revisions under the Renewable Feed Flexibility Project as the previous EA was completed less than 9 months ago. Any changes will be highlighted within this EA. MAQP #5263-01 provides enhancements to the original project design permitted in MAQP #5263-00 and ultimately the facility will be a renewable fuels production facility.

REGULATORY RESPONSIBILITIES: In accordance with ARM 17.4.609(3)(c), DEQ must list any federal, state, or local, authorities that have concurrent or additional jurisdiction or environmental review responsibility for the proposed action and the permits, licenses, and other authorizations required.

MRL must conduct its operations according to the terms of its permit, the CAA of Montana, §§ 75-2-101, *et seq*., MCA, and ARMs 17.8.101, *et seq*.

Upon review of the MRL air quality permit application when combined with HAP emissions from CMR Great Falls Refinery, a Title V permit would be required as both operations are under the common ownership of Calumet Specialty Products Partners, L.P. and the properties are contiguous and/or adjacent.

No other permit applications have been submitted by MRL to DEQ at the time of this EA. MRL is a subsidiary of Calumet Specialty Products Partners, L.P. However, CMR also a subsidiary of Calumet Specialty Products Partners, L.P. had previously submitted an air quality permit application to transfer the equipment identified within the MRL air quality permit application (MAQP #5263-00). The CMR application requested removal of the equipment to be transferred from the existing MAQP #2161-35. The revised CMR MAQP was issued under MAQP #2161-36. Once the transferred equipment and new equipment commissioned under MAQP #5263-00 and MAQP #5263-01 is complete, the transferred equipment would be removed from MAQP #2161-36 under a future permit action. If for any reason, the MRL project was not completed, the transferred equipment would remain eligible for operation under MAQP #2161-36. The exact details of this transfer are covered in MAQP #2161-36. In addition, CMR has also submitted a new application to modify MAQP #2161-36 but that request is unrelated to the permit actions occurring with the issuance of MAQP #5263-01.

MRL must cooperate fully with, and follow the directives of any federal, state, or local entity that may have authority over the MRL Great Falls Renewable Fuels Plant. These permits, licenses, and other authorizations may include: City of Great Falls, Cascade County Weed Control Board, OSHA (worker safety), DEQ AQB (air quality) and Water Protection Bureau groundwater and surface water discharge; stormwater, and MDT and Cascade County (road access).

MRL has requested the air quality permit would use property that is currently owned by CMR. New processing equipment would also be constructed and operated on this same site. The parcel identified is a 44.46 acre site located adjacent to the Missouri River as well as adjacent to the City of Great Falls Wastewater Treatment Plant. MAQP #5263-00 estimated up to 12 acres of disturbance, and the MAQP #5263-01 changes would provide for an additional 3-5 acres of additional disturbance to accommodate the Renewable Feed Flexibility Project.

Figure 1: Map of general location of the proposed project.

EVALUATION AND SUMMARY OF POTENTIAL IMPACTS TO THE PHYSICAL AND HUMAN ENVIRONMENT IN THE AREA AFFECTED BY THE PROPOSED PROJECT:

The impact analysis will identify and evaluate direct and secondary impacts. Direct impacts are those that occur at the same time and place as the action that triggers the effect. Secondary impacts means "a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action." ARM 17.4.603(18). Where impacts are expected to occur, the impacts analysis estimates the duration and intensity of the impact.

The duration of an impact is quantified as follows:

- **Short-term**: Short-term impacts are defined as those impacts that would not last longer than the proposed operation of the site.
- **Long-term**: Long-term impacts are defined as impacts that would remain or occur following shutdown of the proposed facility.

The severity of an impact is measured using the following:

- **No impact**: There would be no change from current conditions.
- **Negligible**: An adverse or beneficial effect would occur but would be at the lowest levels of detection.
- **Minor**: The effect would be noticeable but would be relatively small and would not affect the function or integrity of the resource.
- **Moderate**: The effect would be easily identifiable and would change the function or integrity of the resource.
- **Major**: The effect would alter the resource.

1. TOPOGRAPHY, GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

The site is located on the north-side of the Missouri River on Calumet Montana Refining property adjacent to the river. The parcel proposed for the MRL operation is located approximately 370 feet from the river's edge. The elevation is approximately 3,323 feet as referenced by the nearest topographic map on the Montana DEQ GIS website which has a topographic elevation marked very close to the Burlington Northern Santa Fe railway track.

The Calumet Montana Refinery (Site or CMR) is located on Pleistocene age glacial lake deposits, which overlie the consolidated Kootenai Formation. Lemke (1977) calls these sediments Deposits of Glacial Lake Great Falls. Lemke (1977) describes two subunits as an upper stratigraphic unit consisting predominantly of non-plastic fine sand and silt and a lower stratigraphic unit consisting mostly of laminated to non-laminated plastic clay and minor amounts of silt. Previous investigation activities at the CMR facility have documented the presence of unconsolidated Pleistocene fluvial and lake deposits and various fill material at the surface and immediately beneath the Site. These surficial units have been encountered at variable depths across the site that range as much as 10 to 20 ft below ground surface. The Pleistocene deposits are generally saturated but yield minimal quantities of water to wells because of their low hydraulic conductivity (Wilke 1983). (Directly from MRL – email dated 8/31/2021 from Casey Mueller).

Underlying the Pleistocene glacial lake deposits is the Cretaceous-age Kootenai formation that has been differentiated into the fifth (upper) and fourth (lower) members. The fifth member of the Kootenai formation is encountered sitewide immediately beneath the surficial Pleistocene deposits and/or fill material and is distinguished by red-weathered mudstone that contains lenses and beds of brownish-gray and greenish-gray, cross-bedded, micaceous sandstone and light gray nodular limestone concretions. The lower part contains a dark-gray shale and lignite bed with a significant pre-angiosperm flora. The bottom of the Kootenai formation's upper member occurs at 60-100 feet below ground level near the Site. Groundwater in this unit beneath the site occurs under semi-confined conditions.

Direct Impacts: The information provided above is based on the information that DEQ had available to it at the time of completing this EA and provided by the applicant as part of the permit application detailing the proposed site. Available information includes the permit application, analysis of aerial photography, topographic maps, and other research tools. None of the planned disturbance at the site is considered first time disturbance. Soils would be disturbed during construction and operation of the proposed action. MAQP #5263-00 estimated approximately 12 acres of disturbance would occur for the life of the project and MAQP #5263-01 estimated an additional 3-5 acres of disturbance. There is no impact expected to topography and geology.

Secondary Impacts: No secondary impacts to topography, geology, stability, and moisture would be expected.

2. WATER QUALITY, QUANTITY, AND DISTRIBUTION:

The Missouri River is approximately 370 feet to the south. No wetlands have been identified on the site. There is a long narrow parcel of property owned by CMR between the parcel proposed for the MRL facility and the Missouri River. Available information includes the permit application, analysis of aerial photography, topographic maps, and other research tools.

Direct Impacts: The information provided above is based on the information that DEQ had available to it at the time of completing this EA and provided by the applicant for the purpose of obtaining the pending air quality permit. MRL has not submitted any water quality or MPDES permit applications to DEQ. MRL has indicated within the application that additional permits are not planned except for a renewal for their wastewater pretreatment permit with the City of Great Falls (Wastewater Treatment Plant). This permit limits the allowable discharge of flow, pH, solids and metals from the CMR/MRL site as well as oil and grease. Based on communication with MRL, the permit limits are not expected to change with the addition of the MRL equipment but must be updated to reflect the additional process equipment connected to the wastewater system related to MAQP #5263-00. Based on this information, DEQ does not anticipate an impact to surface water features and water quality, quantity, and distribution management. Wastewater generated from the PTU will not be commingled with the wastewater from the rest of the facility. All PTU wastewater will be shipped directly off-site using railcars.

Six new storage tanks are planned for the Renewable Feed Flexibility Project. This includes one for wastewater, four for various renewable products and one for conventional diesel.

Precipitation and surface water would generally be expected to infiltrate into the subsurface, however, any surface water that may leave the site could carry sediment from the disturbed site. Soil disturbances and storm water during construction would be managed under the Montana Pollutant Discharge Elimination System (MPDES) General Permit for Storm Water Discharges associated with construction activity as MRL would be required for construction and potentially during operations. The applicant would need to obtain authorization to discharge under the General Permit for Storm Water Discharges associated with construction activity prior to ground disturbance. MRL would manage erosion control using a variety of Best Management Practices (BMP) including but not limited to non-draining excavations, containment, diversion and control of surface run off, flow attenuation, revegetation, earthen berms, silt fences, and gravel packs. This plan would minimize any stormwater impacts to surface water in the vicinity of the project. The proposed action could require MRL to obtain a stormwater discharge plan during construction and potentially during operations. This plan would minimize any stormwater impacts to surface water in the vicinity of the project.

No fragile or unique water resources or values are present. Impacts to water quality and quantity, which are resources of significant statewide and societal importance are not expected.

Secondary Impacts: No secondary impacts to water quality, quantity and distribution would be expected. No secondary impacts from storm water runoff would be expected.

3. **AIR QUALITY:**
As of July 8, 2002, Cascade County is designated as an Unclassifiable/Attainment area for all criteria pollutants according to 40 CFR 81.327. Any new stationary source falling under one of the 28 source categories listed in the "major stationary source" definition at ARM 17.8.801(22) would be a major stationary source if it emits, or has the potential to emit, 100 tpy or more of any regulated Prevention of Significant Deterioration (PSD) pollutant, except for (greenhouse gases) GHGs. The plant would be a "chemical process plant", which is one of the 28 source categories. Therefore, the PSD major source threshold for the plant is 100 tpy. Historical wind patterns at the Great Falls International Airport which is located 4.6 miles to the southwest from MRL, indicates prevailing westerly winds from February thru October, and November thru January winds are most often from the south. A local micro-climate along the Missouri flowing directly to the east would also provide a tendency for easterly air flow.

Direct Impacts: Emissions expected from the proposed action as submitted in the air quality permit application received on April 26, 2022, are shown in Table 2 below. The emissions presented represent the combined emissions that would occur not only from the Renewable Feed Flexibility Project but also from all of the permitted equipment at MRL. The total emission inventory is shown because MAQP #5263-01 includes equipment that is still under construction which was authorized under MAQP #5263-00. This summary concludes that the entire MRL facility remains below the PSD major source threshold of 100 tpy.

Table 2: Renewable Fuels Plant Pollutant Potential to Emit Summary

MRL Great Falls Renewable Fuels Plant Regulated PSD Pollutant Potential to Emit Summary			
Pollutant	**Potential to Emit (tpy)**	**PSD Major Source Threshold[6] (tpy)**	**Subject to PSD Review (Yes/No)**
CO	65.50	100	No
NOx	79.67	100	No
PM (filterable only)	2.47	100	No
PM_{10}	8.61	100	No
$PM_{2.5}$	8.54	100	No
SO_2	5.65	100	No
VOC	95.53	100	No
GHGs, as CO_2e[7]	N/A	N/A	N/A

As each pollutant is less than 100 tpy, the proposed facility would not be a major PSD facility. No analysis of greenhouse gases is required for a non-major PSD facility.

Dust particulate would be produced or become airborne during site preparation and construction. Air quality standards, set by the federal government and DEQ AQB and enforced by the AQB, allow for pollutants at the levels permitted within the air quality permit. During construction, heavy equipment and site staging activities would result in emissions from heavy equipment but would cease once construction was completed. Once the site is fully constructed, emissions from the renewable fuels plant would include particulate matter (PM) species, oxides of nitrogen (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), carbon dioxide (CO_2.) Residual volatile organic compounds (VOCs) would leak as fugitives from piping, valves, pumps and other process piping. Project emissions assume the process equipment operates 8,760 hours per year. Air pollution control equipment must be operated at the maximum design for which it is intended ARM 17.8.752(2). Limitations would be placed on the allowable emissions for the renewable fuels plant. As part of the air quality permit application, MRL submitted a Best Available Control Technology (BACT) analysis for each emitting unit. These proposed limits were reviewed and incorporated into MAQP #5263-01 as federally enforceable conditions. These permit limits cover NOx, VOCs, particulate matter and CO with associated ongoing compliance demonstrations, as required by the Department.

Some fugitive road dust may occur on the access routes to the construction areas. Pursuant to ARM 17.8.304(2), fugitive dust emissions would need to meet an operational visible opacity of standard or 20 percent or less averaged over 6 consecutive minutes. Pursuant to ARM 17.8.308(1), MRL is required to take reasonable precautions to control emissions of airborne particulate matter from all phases of operation including material transport. Reasonable precautions would include items such the use of water during construction periods to minimize dust emissions. Air quality standards are also regulated by the federal Clean Air Act, 42 U.S.C. 7401 *et seq*. (1970) and Montana's Clean Indoor Air Act, Mont. Code Ann. § 50-40-101 *et seq*., and are implemented and enforced by DEQ's AQB. As stated above, MRL is required to comply with all applicable state and federal laws.

CMR has also submitted an application to the Air Quality Bureau which is under review by the Department. The CMR permit application asked for some minor changes to existing permit conditions in MAQP #2161-36. The changes being reviewed for the CMR application are not related to the MRL Renewable Feed Flexibility Project.

For all the above reasons, impacts to air quality from the proposed project are anticipated to be short-term and minor.

Secondary Impacts: Criteria pollutants that would be released disperse into the atmosphere and travel with the wind direction, decreasing in concentration as the pollutants are diluted with ambient air. Concentrations of these pollutants would not be allowed to exceed ambient air quality standards where the public has access which usually is considered to be the property boundary of the industrial facility. Therefore, DEQ does not anticipate impacts to air quality in the area outside the property boundary including the adjacent areas of the City of Great Falls.

4. VEGETATION COVER, QUANTITY AND QUALITY:

There are no known rare or sensitive plants or cover types present in the site area. No fragile or unique resources or values, or resources of statewide or societal importance, are present. Petroleum refining has been conducted at this site since the early 1920's. An air quality permit for the site was first issued in 1985. The Department conducted research using the Montana Natural Heritage Program (MTNHP) website and ran the query titled "Environmental Summary Report" dated August 24, 2021. The proposed action is located at an existing refinery in an urban and industrial setting where the vegetation is limited. The Department did not re-run the MTNHP report since the previous report was less than 9 months old.

Direct Impacts: The information provided above is based on the information that DEQ had available to it at the time of completing this EA and provided by the applicant. Available information includes the permit application, analysis of aerial photography, topographic maps, geologic maps, soil maps, and other research tools. As the proposed project would be located on the existing Calumet Refinery site, the vegetation is very limited at the site. No impacts to vegetation cover, quantity and quality would be expected.

Secondary Impacts: Land disturbance at the site would leave little bare ground not occupied by tanks and process equipment.

5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Petroleum refining has been conducted at this site since the early 1920s. As described earlier in Section 4. Vegetation Cover, the larger polygon area is represented by commercial and industrial operations and the Department conducted research using the Montana Natural Heritage Program (MTNHP) website and ran the query titled "Environmental Summary Report" dated August 24, 2021. However, avian population are not likely to exist on the property due to the existing industrial nature of the property. Avian species may be in the proximity of the proposed project due to the Missouri River.

Direct Impacts: The potential impact (including cumulative impacts) to terrestrial, avian and aquatic life and habitats would be negligible.

A list of species of concern is also identified within in Section 6. Unique, Endangered, Fragile or Limited Environmental Resources as reported from the MTNHP report on unique and endangered resources.

Secondary Impacts: No secondary impacts to terrestrial, avian and aquatic life and habitats stimulated or induced by the direct impacts analyzed above would be expected.

6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

DEQ conducted a search using the Montana Natural Heritage Program (MTNHP) webpage. As discussed earlier the polygon selected was the 44.46 acre site.

Species of concern (SOC) from the MTNHP identified the following species: Spiny Softshell, Bald Eagle, Great Blue Heron, Golden Eagle, Black Crowned Night-Heron, Black Tern, Common Tern, Swift Fox, Horned Grebe, Ferruginous Hawk, Franklin's Gull, Piping Plover, Foster's Tern, Caspian Tern, American White Pelican, Common Loon, Trumpeter Swan, Harlequin Duck, Sedge

Wren, Black-tailed Prairie Dog, Black-foot Ferret, and Gray-crowned Rosy-Finch. Many of these species listed as SOC have not been observed within the search polygon. The one exception noted is that Bald Eagles have been observed.

Direct Impacts: The majority species of concern from the MTNHP list are associated with the riverine habitat on the Missouri River, which is approximately 370 feet to the south of proposed action. These species would not be displaced by the proposed action as the site is completely industrial and the parcel in question does not contact the river or river banks. The potential impact (including cumulative impacts) to species present including bald eagles would be negligible.

Secondary Impacts: The proposed action would not have secondary impacts to endangered species because the permit conditions are protective of human and animal health.

7. **HISTORICAL AND ARCHAEOLOGICAL SITES:**

The Montana State Historic Preservation Office (SHPO) was notified of the application. SHPO conducted a file search and provided a letter dated August 25, 2021. The SHPO searched was conducted for Section 1 T20N R3E. Further a review of the project area was conducted by the DEQ archeologist on August 25, 2021. The file search identified 19 cultural resource sites within the search area criteria. After review, nine of the sites were further evaluated due to proximity to the project area. A new SHPO report for MAQP #5263-01 was not requested as the previous report was less than 9 months old.

Direct Impacts: Review of the SHPO report identified three of the 19 sites indicate a potential for impacts to Historic Properties, which is defined as any site that is eligible or potentially eligible to the National Register of Historic Places (NRHP). These are detailed and addressed below.

Site 24CA0656 is a NRHP eligible prehistoric processing site located within less than 300 meters of the project area. The current site status us unknown but given the distance of the project area from the site, there will be no adverse effect to Historic Properties.

Site 24CA0371 is a section of the Cascade County Portion of the Great Northern Railroad which is determined eligible for the NRHP. Though the line exists within the current project boundary, the line will not be physically disturbed, nor does the site retain or rely on aspects of visual integrity that would diminish its eligibility. Therefore, there will be no adverse effects to this Historic Property.

Site 24CA1751 is a historic dump located within the banks of the Missouri River. The site is currently listed as Undetermined for its NRHP status, which qualifies it as a Historic Property until otherwise evaluated. The site is outside of the proposed project area, therefore there will be no adverse effect to this Historic Property.

Due to the limited nature of the proposed disturbance for the project, and the lack of potential from visual elements, there will be no adverse effects to Historic Properties. If resources were discovered during operations resources, it would be MRL's responsibility to determine next steps as required by law.

Secondary Impacts: No secondary impacts to historical and archaeological sites are anticipated.

8. **SAGE GROUSE EXECUTIVE ORDER:**
The project would not be in core, general or connectivity sage grouse habitat, as designated by the Sage Grouse Habitat Conservation Program (Program) at: http://sagegrouse.mt.gov.

Direct Impacts: The proposed action is not located within Sage Grouse habitat, no direct impacts would occur.

Secondary Impacts: No secondary impacts to sage grouse or sage grouse habitat would be expected.

9. AESTHETICS:
The site is located in an area mostly surrounded by industrial private property. Of the 1,280 acres in the larger MTNHP polygon, 1,095 acres are indicated as either private or unknown ownership. The project would occur on private land. The nearest residents to the proposed action reside to the northwest at a distance of approximately 500 feet. There are other houses located directly east of the refinery site starting at about 850 feet from eastern property boundary. It is not expected that the nearest residences to the proposed site would experience any noticeable change in noise levels. Standard noise reducing methods would be employed to minimize the risk that noise levels would rise above current baseline levels. An example of noise minimization would include compressors and pumps being enclosed. The noise levels at the property boundary of the proposed action would not be expected to change.

Direct Impacts: There would be temporary construction with building activities including noise and dust. Equipment planned for construction would likely include cranes, backhoes, graders/dozers, passenger trucks, delivery trucks, cement trucks, and various other types of smaller equipment. The use of the various types of equipment would be spread out over the duration of the expected schedule beginning in the fall of 2022 and continuing into 2023. Once the proposed action is constructed, no discernable change in noise level would be expected. New tanks and other equipment would be visible from Smelter Avenue (Highway 87) located to the north of the refinery property. Impacts would be negligible and short-term. Rail traffic is controlled by Burlington Northern and Santa Fe (BNSF) Railway and is expected to increase with the shipment of PTU wastewater. Truck traffic is expected to increase by 3 trucks per day with rail traffic of 3 railcars per day.

Secondary Impacts: The refinery profile would change slightly with the erection of new tanks and equipment. Noise increases are not expected beyond the proposed action parcel boundary.

10. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
The site is located in an area characterized by heavy industry and commercial businesses.

Direct Impacts: During construction of the proposed action there would be minor increase in energy use to construct the proposed action. Once operational, energy and electric demands would continue for the duration of the facility's lifetime. Renewable fuels would provide fuel for emerging markets where non-fossil fuels are preferred and or required. The MRL production capacity would be approximately 15,000 barrels per day (bpd). See the Air Quality and Water Quality sections of the EA to see the potential impacts from the proposed action regarding Air and Water resources.

Secondary Impacts: During operations, the proposed action would deliver renewable fuels via railcar and trucks to Canadian and west coast U.S. markets. These shipping deliveries would utilize highway and rail infrastructure for product delivery. Expanded production to include renewable kerosene and sustainable aviation fuel would provide for additional market opportunities.

11. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES:
The site is immediately surrounded by commercial and industrial properties.

Direct Impacts: DEQ did not identify any other nearby activities that may affect the project. Therefore, impacts on other environmental resources are not likely to occur as result of this project.

Secondary Impacts: No secondary impacts to other environmental resources are anticipated as a result of the proposed project.

12. HUMAN HEALTH AND SAFETY:
The applicant would be required to adhere to all applicable state and federal safety laws. Some of the existing employees at Calumet Refining would likely become employees at MRL. The access to the public would be restricted to this property with techniques currently used by the Refinery to limit unrestricted access

Direct Impacts: Impacts to human health and safety are anticipated to be short-term and minor as a result of this project. Tanker and rail car deliveries of feedstock would be made to the site and product shipments of renewable fuels would occur using both truck and rail. Tanker and rail shipping are regulated by other state and federal laws to ensure they are operated safely. This would result in increased tanker traffic on the route to and from the site. When the facility would shut down in the future, the direct impacts would cease to exist.

Secondary Impacts: No secondary impacts to human health and safety are anticipated as a result of the proposed project.

13. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION:

The site is currently zoned heavy industrial as is reflected by the existing Calumet refinery and MRL operations, and other industrial and commercial properties. There is no agricultural activity at the site**.** With the proposed project, the MRL capacity would be maintained at approximately 15,000 bpd split across production of all the renewable fuels.

Direct Impacts: A minor decrease on land un-occupied by equipment would occur with approximately 3-5 acres of new disturbance for the proposed action. Most of the rest of the CMR and MRL property is already covered by equipment and access roads on the property. More of the property would be being utilized for industrial production. Impacts on the industrial, commercial, and agricultural activities and production in the area would be minor and short-term. An increase in rail and truck traffic bringing in raw materials including feedstock such as canola oil would occur. Shipping of PTU generated wastewater would also result in an increase in tanker and railcar traffic.

Secondary Impacts: No secondary impacts to industrial, commercial, water conveyance structures, and agricultural activities and production are anticipated as a result of the proposed project.

14. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Prior to issuance of MAQP #5263-00, there were approximately 187 permanent jobs located at the Calumet Refinery. Some of the existing employees have likely become employees of MRL. The Flexible Fuels Feed Project expands the number of permanent employees that will be required at MRL to operate the PTU process and for the production of additional renewable fuels.

Direct Impacts: New employment opportunities would occur with this project. The proposed project would be expected to have only minor impacts on the distribution of employment. During construction approximately 200 - 300 temporary contractor jobs would be created and after construction approximately 30 to 40 new permanent jobs would remain. The duration of employment would be minor and short-term.

Secondary Impacts: Minor increases in in distribution of employment are anticipated as a result of the proposed project. This would be the result of employment created for tanker truck deliveries of feedstock and product deliveries of renewable fuels

15. LOCAL AND STATE TAX BASE AND TAX REVENUES:

The proposed action would be expected to have minor impacts on the local and state tax base and tax revenue. The construction project would provide approximately 300 temporary contractor jobs after which approximately 30 to 40 permanent jobs would be created. Some additional professional staffing jobs may also be created.

Direct Impacts: Local, state and federal governments would be responsible for appraising the property, setting tax rates, collecting taxes, from the companies, employees, or landowners benefitting from this operation.

Secondary Impacts: No secondary impacts to local and state tax base and tax revenues are anticipated as a result of the proposed action.

16. DEMAND FOR GOVERNMENT SERVICES:

The proposed action is in a heavy industrial and commercial area.

Direct Impacts: Compliance review and assistance oversight by DEQ AQB would be conducted in concert with other area activity when in the vicinity. Occasional increases in construction-related traffic would occur but this would only last for the duration of the construction project estimated from the fall of 2022 thru 2023. Oversight by DEQ AQB would be minor and short-term.

Secondary Impacts: Local traffic would likely increase with the new permanent employees and feedstock and product transportation. Impacts would be short-term and minor.

17. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

A review was conducted of the City of Great Falls website on August 25, 2021 for MAQP #5263-00. A zoning map was located and the proposed project would be located on an I-2 Heavy Industrial Zone parcel. Additional review of the City's Planning page revealed a Growth Policy was completed in 2013. Other Planning documents were also viewed one of which was a Missouri River Urban Corridor Plan (Plan). This document was dated 2004. The MRL property near the Missouri River is unlikely to be an area where the preservation of river frontage is addressed by the Plan. The website was again visited on May 12, 2022, to review whether any new documents are available relative to planning at or near the site. No new information was available.

Direct Impacts: MRL is proposing the Flexible Fuels Feed Project on property which is already zoned as Heavy Industrial. No impacts from the proposed action would be expected relative to any locally adopted community planning goals.

Secondary Impacts: No secondary impacts to the locally-adopted environmental plans and goals are anticipated as a result of the proposed action.

18. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

The current site of the proposed action is in an area of industrial use. Recreation opportunities are located to the south of the proposed action via water-activities on the Missouri River. No wilderness areas or other recreational sites are in the vicinity.

Direct Impacts: There would be no impacts to the access to wilderness activities as none are in the vicinity of the proposed action. Recreationalists on the Missouri River would likely be able to see some of the new tanks. These recreationalists might be river rafters, fishermen and others drawn to the river. The noise would be similar in nature to the existing CMR and existing MRL operations. If a receptor were to increase their distance from the proposed action, noise and visual impacts would decrease. Duration would be expected to be negligible and short-term.

Secondary Impacts: No secondary impacts to access and quality of recreational and wilderness activities are anticipated as a result of the proposed project.

19. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

The proximity of the proposed action to the City of Great Falls would easily be able to handle all housing needs for temporary workers.

Direct Impacts: The project would not add to the population or require additional housing, therefore, no impacts to density and distribution of population and housing are anticipated. The temporary construction workers would use the existing housing in the surrounding communities for the duration of the construction schedule. The 30 to 40 new permanent workers would not be expected to create a housing shortage in the surrounding communities. As identified elsewhere, the construction schedule is estimated to last from the fall of 2022 thru the 2023. The duration of the on-going employment would be minor and short-term.

Secondary Impacts: No secondary impacts to density and distribution of population and housing are anticipated as a result of the proposed action.

20. SOCIAL STRUCTURES AND MORES:

Based on the required information provided by MRL, DEQ is not aware of any native cultural concerns that would be affected by the proposed activity.

Direct Impacts: This proposed action is located on an existing industrial site, no disruption of native or traditional lifestyles would be expected, therefore, no impacts to social structure and mores are anticipated.

Secondary Impacts: No secondary impacts to social structures and mores are anticipated as a result of the proposed operations.

21. CULTURAL UNIQUENESS AND DIVERSITY:

Based on the required information provided by MRL, DEQ is not aware of any unique qualities of the area that would be affected by the proposed activity.

Direct Impacts: No impacts to cultural uniqueness and diversity are anticipated from this project.

Secondary Impacts: No secondary impacts to cultural uniqueness and diversity are anticipated as a result of the proposed project.

22. PRIVATE PROPERTY IMPACTS:

The proposed project would take place on privately-owned land. The analysis done in response to the Private Property Assessment Act indicates no impact. DEQ does not plan to deny the application or impose conditions that would restrict the regulated person's use of private property so as to constitute a taking. (See Attached Private Property Assessment Act (PPAA) Checklist. Further, if the application is complete, DEQ must take action on the permit pursuant to § 75-2-218(2), MCA. Therefore, DEQ does not have discretion to take the action in another way that would have less impact on private property—its action is bound by a statute.

There are private residences in the area of the proposed project. The closest residence is located approximately 500 feet to the northwest from the western property boundary. Other residences are located approximately 850 feet directly to the east from the eastern property boundary.

23. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Due to the nature of the proposed action, no further direct or secondary impacts are anticipated from this project.

ADDITIONAL ALTERNATIVES CONSIDERED:

No Action Alternative: In addition to the proposed action, DEQ is considering a "no action" alternative. The "no action" alternative would deny the approval of the proposed action. The applicant would lack the authority to conduct the proposed activity. Any potential impacts that would result from the proposed action would not occur. The no action alternative forms the baseline from which the impacts of the proposed action can be measured.

Other Ways to Accomplish the Action:

In order to meet the project objective of producing renewable fuel products, specific raw materials and energy inputs are necessary, and while the configuration for these processes could be modified for a different physical layout, the relative disturbed area and energy inputs and therefore the associated emissions would not be substantially different than the proposed action.

If the applicant demonstrates compliance with all applicable rules and regulations as required for approval, the "no action" alternative would not be appropriate. Pursuant to, § 75-1-201(4)(a), (MCA) DEQ "may not withhold, deny, or impose conditions on any permit or other authority to act based on" an environmental assessment.

CUMULATIVE IMPACTS:

Cumulative impacts are the collective impacts on the human environment within the borders of Montana of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location and generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures. There is currently an air quality permit application from CMR requesting some minor changes to permitting conditions. There are currently no other permit applications for this facility pending before DEQ. Although additional permits may be necessary for this facility in the future, without a pending permit application containing the requisite information, DEQ cannot speculate about which permits may be necessary or which permits may be granted or denied. For example, at this time DEQ does not have sufficient information to determine whether or not a MPDES permit would be required although MRL does not anticipate needing one, and therefore cannot predict whether there would be a discharge associated with this facility. There may, therefore, be additional cumulative impacts (*e.g.* to water) associated with this facility in the future, but those impacts would be analyzed by future environmental reviews associated with those later permitting actions. (For example, if MRL applies for a MPDES permit DEQ will analyze the cumulative impacts of the already issued air quality permit and the then-pending MPDES permit.) This environmental review analyzes only the proposed action submitted by MRL, which is the air quality permit regulating the emissions from the equipment as listed in the "proposed action" section, above.

There are other sources of industrial emissions in the vicinity. CMR is known to have emissions including CO, VOCs, SO_2, NOx and particulate matter and currently operates under MAQP #2161-36. These emissions are limited thru enforceable conditions within their air quality permit. There is also the City of Great Falls Wastewater Treatment facility that like any treatment plant would have emissions. The Wastewater Plant operates under MAQP #4176-00 and has limits in place for both NOx and VOCs. Additionally, there is an incinerator operated in the area by the Montana Highway Patrol. MAQP #5174-00 is held by the Montana Highway Patrol for the purpose of destruction of drugs. The Highway Patrol incinerator is approximately 0.7 mile away. The incinerator is restricted on particulate matter emissions and opacity. Finally, Grain Craft (MAQP #2885-01) operates a flour milling operation to the southeast which is approximately 0.8 mile away and is limited only on opacity. Collectively, these sources and the proposed action can all contribute to the ambient air quality and when future permit actions occur at either MRL or CMR. These actions may require future analysis, depending upon the magnitude of future emission increases. Since the proposed action (even when the equipment previously permitted under MAQP

#5263-00 is included) is not major for PSD, a review of existing permitted sources is not required. The proposed action would not be expected to have any discernable impact as the emission increases remain below PSD thresholds. No change in the EPA air quality designation would be expected. As of July 8, 2002, Cascade County was designated as an Unclassifiable/Attainment area for all criteria pollutants.

A review was also conducted of the City of Great Falls Growth Policy which appears to have been updated in 2013. Several elements which are addressed in the Growth Policy include provisions to guide land-use, transportation, economic development, housing needs and population projections.

DEQ considered potential impacts related to this project and potential secondary impacts. Due to the limited activities in the analysis area, cumulative impacts related to this project would be minor and short-term. The cumulative table for any direct and secondary impacts is located at the very end of this EA in Table III. Those cumulative impacts are also highlighted here regardless of the probability identified in Table III.

Soils would be disturbed to for staging equipment and for constructing concrete pads. The disturbance for construction would cease after all of the equipment was installed. Fugitive dust following construction would likely be limited to road dust from vehicle traffic.

Air quality would not be expected to deteriorate or change from its current classification of Unclassifiable/Attainment for all criteria pollutants. The proposed action is not a PSD action as the project increases for the entire MRL facility would be less than 100 tpy. The MRL facility remains at a capacity of approximately 15,000 bpd of renewable fuels. Emissions of NOx and CO are also minimized through the use of ultra-low NOx burners along with continuous emission monitors for NOx and oxygen (O_2). VOC tank emissions are minimized through application of BACT on the seven new tanks.

Historical and archaeologic sites are known to exist near the proposed project but not expected to be encountered due to the long history of crude oil refining on the site. Any excavation that would result in any significant findings would need to be investigated before further work continued.

Changes in aesthetics for the proposed project would not be expected to materially change the characteristics at the site. The site is already characterized as industrial in nature and includes large visible heaters and equipment. Typical engineering design for noise minimization would be incorporated to prevent excessive noise migration from the site.

Exposure to industrial equipment would be similar in nature to the hazards already occurring under the CMR and MRL permits. Some additional railcar and truck unloading for feedstock such as canola oil would occur. Additional shipments of PTU wastewater on trucks and rail would also occur.

The existing parcel where the project would be constructed will almost entirely be occupied by equipment either operated by MRL or by CMR. Any future construction projects at the site which would require a significant footprint, would be limited by the remaining physical space on the site. Calumet does own other adjacent parcels in the area and these plots would be candidates for future projects.

Based on the application submitted by MRL, both a temporary increase in workforce as well as permanent increase in workforce would be expected for the overall Calumet parent company. Some employees currently working at CMR would be expected to shift over to employment at MRL.

PUBLIC INVOLVEMENT:

Scoping for this proposed action consisted of internal efforts to identify substantive issues and/or concerns related to the proposed operation. Internal scoping consisted of internal review of the environmental assessment document by DEQ Air Permitting staff.

Internal efforts also included queries to the following websites/ databases/ personnel:
- Montana State Historic Preservation Office
- Montana Department of Environmental Quality (DEQ)
- Cascade County Website
- Montana Natural Heritage Program
- Montana Cadastral Mapping Program

OTHER GOVERNMENTAL AGENCIES WITH JURSIDICTION:

The proposed project would be fully located on privately-owned land. All applicable local, state, and federal rules must be adhered to, which, at some level, may also include other local, state, federal, or tribal agency jurisdiction. Other Governmental Agencies which May Have Overlapping or Sole Jurisdiction include, but may not be limited to: City of Great Falls, Cascade County Commission or County Planning Department (zoning), Cascade County Weed Control Board, OSHA (worker safety), DEQ AQB (air quality) and Water Protection Bureau (groundwater and surface water discharge; stormwater), DNRC (water rights), and MDT and Cascade County (road access).

NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS

Under ARM 17.4.608, DEQ is required to determine the significance of impacts associated with the proposed action. This determination is the basis for the agency's decision concerning the need to prepare an environmental impact statement and also refers to DEQ's evaluation of individual and cumulative impacts. DEQ is required to consider the following criteria in determining the significance of each impact on the quality of the human environment:

1. The severity, duration, geographic extent, and frequency of the occurrence of the impact;

   "Severity" is analyzed as the density of the potential impact while "extent" is described as the area where the impact is likely to occur. An example could be that a project may propagate ten noxious weeds on a surface area of 1 square foot. In this case, the impact may be a high severity over a low extent. If those ten noxious weeds were located over ten acres there may be a low severity over a larger extent.

   "Duration" is analyzed as the time period in which the impact may occur while "frequency" is analyzed as how often the impact may occur. For example, an operation that occurs throughout the night may have impacts associated with lighting that occur every night (frequency) over the course of the one season project (duration).

2. The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;

3. Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;

4. The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values;

5. The importance to the state and to society of each environmental resource or value that would be affected;

6. Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and

7. Potential conflict with local, state, or federal laws, requirements, or formal plans.

The significance determination is made by giving weight to these criteria in their totality. For example, impacts with moderate or major severity may be determined to be not significant if the duration of the impacts is considered to be short-term. As another example, however, moderate or major impacts of short-term duration may be considered to be significant if the quantity and quality of the resource is limited and/or the resource is considered to be unique or fragile. As a final example, moderate or major impacts to a resource may be determined to be not significant if the quantity of that resource is high or the quality of the resource is not unique or fragile.

Pursuant to ARM 17.4.607, preparation of an environmental assessment is the appropriate level of environmental review under MEPA if statutory requirements do not allow sufficient time for an agency to prepare an environmental impact statement. An agency determines whether sufficient time is available to prepare an environmental impact statement by comparing statutory requirements that establish when the agency must make its decision on the proposed action with the time required to obtain public review of an environmental impact statement plus a reasonable period to prepare a draft environmental review and, if required, a final environmental impact statement.

SIGNIFICANCE DETERMINATION

The severity, duration, geographic extent and frequency of the occurrence of the impacts associated with the proposed action would be limited. MRL proposes to construct and operate the proposed renewable fuels plant on portions of a CMR parcel located on private land, within the city limits of Great Falls, Montana. The estimated construction disturbance for MAQP #5263-00 was about 12 acres during construction. And the on-going disturbed acreage once operational would also be 12 acres. Once operational, the 12 acres includes the area that would be occupied by new equipment including the large storage tanks. For the revised MAQP #5263-01, an additional 3 to 5 acres of both disturbance and land permanently occupied would occur.

DEQ has not identified any significant impacts associated with the proposed action for any environmental resource. Approving MRL's Air Quality Application would not set precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions. DEQ also has received an air quality application from CMR but it is not related to the application for MRL. The CMR application requests some changes to existing permit condition. DEQ is currently processing the CMR application. DEQ would conduct a new environmental review for any subsequent air quality permit applications sought by MRL. DEQ would make a decision on MRL's subsequent application based on the criteria set forth in the CAA of Montana.

DEQ's issuance of an Air Quality Permit to MRL for this proposed operation does not set a precedent for DEQ's review of other applications, including the level of environmental review. The level of environmental review decision is made based on a case-specific consideration of the criteria set forth in ARM 17.4.608.

DEQ does not believe that the proposed action has any growth-inducing or growth-inhibiting aspects or that it conflicts with any local, state, or federal laws, requirements, or formal plans. Based on a consideration of the criteria set forth in ARM 17.4.608, the proposed state action is not predicted to significantly impact the quality of the human environment. Therefore, at this time, preparation of an environmental assessment is determined to be the appropriate level of environmental review under the Montana Environmental Protection Act.

Environmental Assessment and Significance Determination Prepared By:

Craig Henrikson	Environmental Engineer, P.E.
Name	**Title**

EA Reviewed By:

Julie Merkel	Permitting Services Section Supervisor
Name	**Title**

References

Air Quality Permit Application Received April 26, 2022
Montana State Historical Preservation Office (SHPO) Report Received August 25, 2021
Montana Natural Heritage Program (Website Search Downloads) Last Download Aug 15, 2021
Montana Cadastral GIS Layer – Through-Out Project Up Until Draft Issuance
Air Quality Bureau Permitted Source List-GIS Layer
Air Quality Permit MAQP #5263-00 and associated EA
Air Quality Permit MAQP #2885-01
Air Quality Permit MAQP #4176-00
Air Quality Permit MAQP #5174-00
Air Quality Permit MAQP #2161-36
City of Great Falls Website – Planning Documents – Reviewed on May 12, 2022
Wind Rose Information – Great Falls International Airport

Table III: Summary of Potential Impacts that could Result from the Renewable Fuels Project (Facility).

Potential Impact	Affected Resource and Section Reference	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability[5] impact would occur	Cumulative Impacts	Measures to reduce impact as proposed by applicant	Significance (yes/ no)
Soil Disturbance/Fugitive Dust	I. TOPOGRAPHY, GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE. II. WATER QUALITY, QUANTITY, AND DISTRIBUTION III. AIR QUALITY	**S**-medium: The 15-18 acre disturbance both during construction and following construction, could be susceptible to erosion and fugitive dust. **E**-medium: Total surface disturbance would be 15-18 acres. **D**-The entire construction project would occur within approximately one to one and half years. There is no existing vegetation on the site. **F**-During occasional moisture events or high wind events. **U/F**-Not unique or particularly fragile.	Certain	The construction period of approximately one to one a half years limits the possible duration and extent of and erosion or fugitive dust. The majority of the site is currently already paved. Once constructed, there would no longer be exposed soils as those areas would be occupied by equipment pads.	MRL would be required to follow reasonable precautions for storm run-off and fugitive dust.	No
VOC, NOx, CO, PM emission release as well as fugitive dust	II. AIR QUALITY	**S**-low: Emissions released from MRL would largely be off-set by decreases occurring at CMR. The Renewable Feed Flexibility Project provides for minor increases over permitted levels in MAQP #5263-00. **E**-small: Total surface disturbance is estimated at 15-18 acres. **D**- The entire construction project would occur within approximately one to one a half years. Emissions from combustion processes would be on-going for the duration of the facility life. **F**-Daily during normal operation **U/F**-Not unique or particularly fragile.	Certain	The emission increases that would occur at MRL would largely be off-set by emission decreases at CMR. Discernable changes in ambient air quality would not be expected.	Emission control technologies such as ultra-low NOx burners, Best Available Control Technology (BACT) limits, federal NESHAP requirements	No

Potential Impact	Affected Resource and Section Reference	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability[5] impact would occur	Cumulative Impacts	Measures to reduce impact as proposed by applicant	Significance (yes/ no)
Impacts to Historical and Archaeological Sites	III. HISTORICAL AND ARCHAEOLOGICAL SITES:	**S** -low: All areas proposed for disturbance have been previously disturbed. No impact to sites would be anticipated. **E** – low: Site has been petroleum refinery since 1920's. **D** – long-term, any disturbance to archaeological sites would be permanent **F**- Once **U/F**-Not unique or particularly fragile.	Unlikely	Impacts to historical and archaeological sites associated with the project would add to the cumulative impacts associated with any other future developments around the area.	SHPO recommendations would be followed by MRL upon discovery of any historical site significance.	No
Noise increases and visual changes	IV. AESHETICS	**S**-low: Noise increases would not be expected to increase above current baseline. Visual changes would just include more industrial equipment into view from certain locations. **E**-small: The equipment would be installed on the interior of an existing parcel. Not readily accessible to public. **D**- The entire construction project would occur within approximately one to one and half years. Noise and visual changes would be on-going for the duration of the facility life. **F**-Daily: During life of the MRL facility **U/F**-Not unique or particularly fragile.	Possible	Discernable changes in noise would likely not occur. Visual differences would not change the fact the site is already a petroleum refinery and chemical plant.	Equipment would be located away from exterior of property boundary.	No

Energy use increase onsite and transportation energy use increases	V. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY	**S**-low: Increases in energy use at MRL are mostly off-set by decreases at CMR. **E**-small: Shipping increases at MRL are mostly off-set by decreases at CMR but PTU wastewater shipping will increase. **D**- Energy use at MRL would be on-going for the duration of the facility. **F**-Daily during life of the MRL facility **U/F**-Not unique or particularly fragile.	Certain	Overall energy use would be off-set by the increases at MRL being balanced by the decreases at CMR. A renewable fuels product would be produced for emerging markets where non-fossil derived fuel is required and or preferred.	None proposed	No
Potential Impact	**Affected Resource and Section Reference**	**Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)**	**Probability[5] impact will occur**	**Cumulative Impacts**	**Measures to reduce impact as proposed by applicant**	**Significance (yes/no)**
Traffic Increases and employee exposure to new equipment	VI. HUMAN HEALTH AND SAFETY	**S**-low: Increases in shipping from MRL would largely be off-set by decreases at CMR. Equipment transferred from CMR to MRL would be similar in employee exposure for personnel hazards. **E**-low:. **D**- Traffic and employee personnel impacts would be on-going for the duration of the facility. **F**-Daily during life of the MRL facility **U/F**-Not unique or particularly fragile.	Possible	Overall traffic and personnel impacts would be off-set by the increases at MRL being balanced by the decreases at CMR. Some increase in shipping via railcar and truck would be associated with feedstock including canola oil and for additional truck and rail cars for PTU wastewater.	None proposed.	No
Less bare land at site and increase in amount of land footprint used for diesel production	VII. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION	**S** -low: The 15-18-acre disturbance both during construction and following construction. **E** – low: Total surface disturbance would be 15-18 acres. **D** – Duration of the life of the MRL facility **F**- Daily **U/F**-Not unique or particularly fragile.	Certain	Any future projects would be limited by remaining physical space to install new equipment without the demolition of existing equipment.	None proposed.	No
Tax base increase and	VIII. QUANTITY AND	**S** -Medium; Construction workers employed during construction period. Increase in	Certain	Increase in permanently employed workers	None proposed.	No

employm ent gains	DISTRIBUTION OF EMPLOYMENT	permanent employees across the MRL and CMR sites. **E** – low: Relatively low increase in permanent employees for area. **D** – Duration of the life of the MRL facility **F**- Daily **U/F**-Not unique or particularly fragile				

Definitions are quantified as follows:

- Short-term: Short-term impacts are defined as those impacts that would not last longer than the proposed operation of the site.
- Long-term: Long-term impacts are defined as impacts that would remain or occur following shutdown of the proposed facility.

The severity of an impact is measured using the following:

- No impact: There would be no change from current conditions.
- Negligible: An adverse or beneficial effect would occur but would be at the lowest levels of detection.
- Minor: The effect would be noticeable but would be relatively small and would not affect the function or integrity of the resource.
- Moderate: The effect would be easily identifiable and would change the function or integrity of the resource.
- Major: The effect would alter the resource.

1. Severity describes the density at which the impact may occur. Levels used are low, medium, high.
2. Extent describes the land area over which the impact may occur. Levels used are small, medium, and large.
3. Duration describes the time period over which the impact may occur. Descriptors used are discrete time increments (day, month, year, and season).
4. Frequency describes how often the impact may occur.
5. Probability describes how likely it is that the impact may occur without mitigation. Levels used are: impossible, unlikely, possible, probable, certain