UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region08

Ref: 8P-AR

Mr. Aaron Trabing
EH&S Supervisor
Chemtrade Logistics
140 Goes In Lodge Road
Riverton, Wyoming 82501

AUG 2 7 2015

Re: Chemtrade Logistics, Chemtrade Refinery Services, Inc., Riverton, Wyoming Sulfuric Acid Manufacturing Facility Permit # SMNSR-WR-000003-2013.001, Synthetic Minor New Source Review Permit

Dear Mr. Trabing:

The U.S. Environmental Protection Agency Region 8 has completed its review of Chemtrade Logistics' application requesting a synthetic minor new source review permit for the Chemtrade Refinery Services, Inc., Riverton, Wyoming Sulfuric Acid Manufacturing Facility, located on the Wind River Indian Reservation in Wyoming, pursuant to the Tribal Minor New Source Review (MNSR) Permit Program at 40 CFR Part 49. Based on the information submitted in Chemtrade's application, the EPA hereby issues the enclosed final MNSR permit for the Chemtrade Refinery Services, Inc., Riverton, Wyoming Sulfuric Acid Manufacturing Facility. Please review each condition carefully and note any restrictions placed on this source.

A 30-day public comment period was held from June 26, 2015 to July 27, 2015. The EPA received comments from Steve Babits of the Northern Arapaho Environmental Office, and from Eyaad Odeh of Chemtrade Logistics, on July 24, 2015. No other comments were received during the public comment period. The EPA's response to the public comments is also enclosed. The EPA made several revisions to the permit based on the comments. The final permit will be effective on September 28, 2015.

Pursuant to 40 CFR 49.159, within 30 days after the final permit decision has been issued, any person who commented on the specific terms and conditions of the draft permit, may petition the Environmental Appeals Board to review any term or condition of the permit. Any person who failed to comment on the specific terms and conditions of this permit may petition for administrative review only to the extent that the changes from the draft to the final permit or other new grounds were not reasonably ascertainable during the public comment period. The 30-day period within which a person may request review begins with this notice of the final permit decision. If an administrative review of the final permit is requested, the specific terms and conditions of the permit that are the subject of the request for review must be stayed.

If you have any questions concerning the enclosed final permit please contact Claudia Smith of my staff at (303) 312-6520.

Sincerely,

Darcy O'Connor
Acting Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

Enclosures (2)

cc: Ryan Ortiz, Director, Northern Arapaho Environmental Office
Phoebe Wilson, Executive Secretary, Eastern Shoshone Tribe
Helen Cane, Plant Manager, Chemtrade Refinery Services, Inc.

Enclosure -Response to Comments and Changes to Proposed Synthetic Minor MNSR Permit for the Chemtrade Refinery Services, Inc., Riverton, Wyoming Sulfuric Acid Manufacturing Facility

Comments from Steve Babits of the Northern Arapaho Environmental Office – Received July 24, 2015

1. "The Northern Arapaho Tribe would like Chemtrade to send copies of required reports and notifications of any deviations to this office at the address below. If EPA does not have the authority to require Chemtrade to report directly to the Tribe, then we would like EPA to provide a copy to the Tribe." (address referred to in the comment is: Northern Arapaho Environmental Office, P.O. Box 396, Ft. Washakie, Wyoming 82514)

EPA Response: We appreciate the Northern Arapaho Tribe's interest in the Chemtrade permit and required reports. The EPA will work with the Northern Arapaho Tribe to ensure that it receives the information requested.

Comments from Eyaad Odeh, Senior Environmental Project Manager, Chemtrade Logistics – Received July 24, 2015

1. **"Technical Support Document Page 10 of 15 – Section B**

   Section B. '**We are also proposing to require that Chemtrade install, certify, calibrate, maintain, and operate a continuous opacity monitoring system (COMS)** to measure and record the visible emissions from the scrubber exhaust stacks of Plants #1 and #2 to demonstrate compliance with the opacity limits. The COMS shall be continuously operated at all times the plants are operating to produce.'

   Chemtrade Comment:

   Chemtrade requests that the following language be removed from the TDS:" *(sic)* "'We are also proposing to require that Chemtrade install, certify, calibrate, maintain, and operate a continuous opacity monitoring system (COMS) to measure and record the visible emissions from the scrubber exhaust stacks of Plants #1 and #2 to demonstrate compliance with the opacity limits. The COMS shall be continuously operated at all times the plants are operating to produce'

   The CD did not require the facility to install a COMS at any of the sulfuric acid facilities. A COMS is optional to show compliance, Chemtrade has elected not to exercise that option under the CD."

EPA Response: The requested change to the TSD was not made. Upon further review of the CD when drafting the permit, we noted that the CD did not actually require the COMS, but said a COMS may be used to demonstrate compliance with the opacity limits. We revised the draft

proposed permit at the time to reflect the CD requirement, but inadvertently failed to update the TSD regarding that permit requirement; however, we do not issue a TSD with the final permit. Therefore, the language in the TSD for the proposed permit has not been revised as requested. The comment and this response are documented as part of the administrative record for the final permit. No changes have been made to the permit in response to this comment.

2. **"Permit Page 6 of 26 – Control and Operational Requirements Section D.4**

> (4): The Permittee shall install, certify, calibrate, operate, and maintain a continuous emissions monitoring system (CEMS) in the scrubber exhaust stack of both Plant #1 and Plant #2 that is equipped with a converter inlet SO_2 analyzer and is capable of directly measuring, calculating, and recording the in-stack volumetric flow rate, the in-stack SO_2 emission rate concentrations, expressed as the average lb/ton of 100% H2SO4 produced in any consecutive 3-hour period, and the in-stack oxygen (O_2) concentration.
>
> Chemtrade Comment:
>
> Chemtrade requests that the language in Section D.4 be removed from the final permit because it is factually incorrect and the intent of the section is met in the preceding section (Section D.5) by incorporating by reference Appendixes" *(sic)* " B and C. Plants #1 and #2 have different requirements under Appendixes" *(sic)* " B and C and the language referenced above indicates that they are identical. Plant #1 (Appendix B) is required to have a SO_2 analyzer on the scrubber exhaust stack, an in-stack oxygen analyzer, and a flow meter, while Plant #2 (Appendix C) is required to have a SO_2 analyzer on the scrubber exhaust stack, an inlet converter SO_2 analyzer, and a stack flow meter."

EPA Response: We recognize that the proposed permit contained factually inaccurate language regarding the configuration of the monitoring equipment at the facility. However, this condition was not removed from the permit as requested. The synthetic minor MNSR permit is intended to replace the CD as the origin of authority of the applicable requirements for the facility. However, according to 40 CFR 49.155(a)(3)(ii), a MNSR permit must contain "As necessary, requirements concerning the use, maintenance and installation of monitoring equipment or methods." The referenced appendices do not contain requirements to install the monitoring equipment, only the protocols for using the monitoring equipment. Therefore, rather than remove the condition from the permit, we have revised the language to accurately reflect the differences in monitoring equipment configuration between Plant #1 and Plant #2 as follows:

"4. The Permittee shall install, certify, calibrate, operate, and maintain a continuous emissions monitoring system (CEMS) in the scrubber exhaust stack of both Plant #1 and Plant #2. The CEMS for Plant #1 shall be equipped with a SO_2 analyzer on the scrubber exhaust stack, an in-stack O_2 analyzer, and a flow meter. The CEMS for Plant #2 shall be equipped with a SO_2 analyzer on the scrubber exhaust stack, an inlet converter SO_2 analyzer, and a stack flow meter. Each CEMS shall be capable of directly measuring, calculating, and recording the in-stack volumetric flow rate, the in-stack SO_2 emission rate concentrations, expressed as the average lb/ton of 100% H_2SO_4 produced in any consecutive 3-hour period, and, specific to Plant

#1, the in-stack oxygen (O_2) concentration. Each CEMS shall be continuously operated at all times each respective plant is operating or shut down, to demonstrate compliance with the emission limits in this permit, except during CEMS breakdown, repairs, calibration checks, and zero span adjustments."

3. **"Permit Page 7 of 26 – Control and Operational Requirements Section E.1.a**

Permit Section: The initial performance tests shall be conducted within 90 calendar days of the effective date of this permit.

Chemtrade Comment:

Chemtrade requests that the 'effective date of this permit' be clarified. The initial performance test was successfully conducted in 2010. As it reads now, Chemtrade would be required to perform another "initial" performance test once this current permit is finalized which would be an additional requirement outside the scope of the CD."

EPA Response: It was our intent to require an initial performance test under this permit to provide enforceability of the requested emission limitations. As stated previously in this response to comments document, the synthetic minor MNSR permit is intended to replace the CD as the origin of authority of the applicable requirements for the facility. However, according to 40 CFR 49.155(a)(1)(iii), the permit must include "Monitoring, recordkeeping, reporting, and testing requirements to assure compliance with the emission limitations." The proposed permit condition already contains language allowing the results of performance tests conducted prior to the effective date of the permit to be used to demonstrate compliance with the initial performance test requirement, provided the tests were conducted in an equivalent manner as the performance test requirement in the permit. Therefore, Chemtrade will be allowed to provide documentation of the initial performance test conducted in 2010 to meet this requirement. One slight change for clarification has been made to the permit based on this comment, replacing the word "used" in the condition with the word "submitted."

4. "**Permit Page 8 of 26 – Control and Operational Requirements Section E.3 & 5**

Permit Section:

Section E.3: 'The Permittee shall not abort any tests that demonstrate non-compliance with the emission limits specified in this permit.'

Section E.5: 'If the results of a complete and valid performance test of the emissions from Plant #1 or Plant #2 demonstrate noncompliance with the emission limits specified in this permit, the plant shall be shut down as soon as safely possible, and appropriate corrective action shall be taken (e.g., repairs, component cleaning, component replacement). The Permittee shall notify the EPA in writing within 24 hours of each such shut down. The plant must be retested within 7 days of being restarted and the emissions must meet the

applicable limits in this permit. If the retest shows that the emissions continue to exceed the limits specified in this permit, the plant shall again be shut down as soon as safely possible, and the plant may not operate, except for purposes of startup and testing, until the Permittee demonstrates through testing that the emissions do not exceed the emission limits specified in this permit.'

Chemtrade Comment:

Chemtrade requests that Section E.3 & 5 be removed from the final permit. Both sections are not required in the current CD or the current Title V Part 71 permit. It is outside the scope of the intent of this permit modification to incorporate the terms of the CD into a facility Synthetic Minor permit."

EPA Response: These conditions were not removed from the permit as requested. These conditions contain standard language for synthetic minor MNSR permits we issue and provide enforceability of the requested emission limitations through compliance demonstration. 40 CFR 49.155(a)(3) provides that the permit must include any monitoring we determine is necessary to assure compliance with the emission limitations. The permitting authority must be informed of all instances of non-compliance and what was done to correct it. Testing is one of the methods required to determine compliance. If all tests showing non-compliance are aborted and only tests showing compliance are fully completed, the permitting authority and the public would be deprived of valuable information on deviations from the permit conditions, successful corrective actions, and potential indicators of non-compliance.

5. "**Permit Page 8 of 26 – Monitoring Requirements Section F.3**

Permit Section:

Section F.3: 'At least once during each calendar week in which the permitted source operates, the Permittee shall perform a visible emissions survey of the scrubber exhaust stacks of Plant #1 and Plant #2 to demonstrate continuous compliance with the opacity limits in this permit. The survey shall be performed during daylight hours, while the facility is operating, and by an individual trained in EPA Reference Method 22 of 40 CFR Part 60, Appendix A...'

Chemtrade Comment:

Chemtrade requests that Section F.3 be removed from the final permit. The requirement is not listed in the current CD or the current Title V Part 71 permit. It is outside the scope of the intent of this permit modification to incorporate the terms of the CD into a facility Synthetic Minor permit."

EPA Response: This condition was not removed from the permit as requested. This is standard language for synthetic minor MNSR permits with opacity limits we issue to provide

enforceability of emission limits through compliance demonstration. 40 CFR 49.155(a)(3) provides that we may require any monitoring we determine is necessary to assure compliance with the emission limits. §49.155(a)(3)(i) states that "Any emissions monitoring, including analysis procedures, test methods, periodic testing, instrumental monitoring, and non-instrumental monitoring…shall assure use of test methods, units, averaging periods and other statistical conventions consistent with the required emission limitations." The opacity limits specified in the CD and transferred to the proposed permit must apply at all times. Performance testing, including visible emissions, was only required in the CD initially. Even considering the permit proposed to extend performance testing to each time the EPA requests it and each time a plant is rebuilt or replaced, we determined that more frequent visible emissions monitoring was necessary to demonstrate compliance with opacity limits that apply at all times the applicable emissions units are operating. We determined that weekly visible emissions surveys would improve the enforceability of the requested opacity limits.

Additionally, for improved clarification, we revised this condition, as well as condition E.1., to state that a COMS may be used for demonstrating compliance with the opacity limits in lieu of weekly visible emissions surveys or EPA Reference Method 9 testing.

United States Environmental Protection Agency
Region 8 Air Program
1595 Wynkoop Street
Denver, CO 80202

Air Pollution Control
Synthetic Minor Source Permit to Construct

40 CFR 49.151

 # SMNSR-WR-000003-2013.001

Permit to Construct to establish legally and practically enforceable limitations and requirements on sources at an existing facility

Permittee:

Chemtrade Logistics

Permitted Facility:

Chemtrade Refinery Service, Inc.
(Riverton, Wyoming, Sulfuric Acid Manufacturing Facility)
Wind River Indian Reservation
Fremont County, Wyoming

Summary

On December 24, 2013, the EPA received an application from Chemtrade Logistics (Chemtrade) requesting a synthetic minor permit for the Chemtrade Refinery Services, Inc. Riverton, Wyoming, Sulfuric Acid Manufacturing Facility (facility) in accordance with the requirements of the Tribal Minor New Source Review (MNSR) Permit Program.

This permit action applies to an existing facility operating on the Wind River Indian Reservation. The facility has two (2) primary sulfuric acid (H_2SO_4) production plants that operate differently to manufacture H_2SO_4 in varying concentrations. Plant #1 produces H_2SO_4 using elemental sulfur as a feedstock. Plant #2 produces H_2SO_4 by a regeneration process using spent acid and elemental sulfur (from the petroleum refining or other industries) as a feedstock.

This permit does not authorize the construction of any new emission sources, or emission increases from existing units, nor does it otherwise authorize any other physical modifications to the facility or its operations. This permit is intended only to incorporate required emission limits and provisions from a January 12, 2009, federal Consent Decree (CD) with the United States of America, the States of Louisiana and Ohio, the Oklahoma Department of Environmental Quality, and the Northern Arapaho Tribe related to air emissions at the facility (Case 3:09-cv-00067), which became effective on January 1, 2013.

The CD requires that Chemtrade control the sulfur dioxide (SO_2) emissions from two (2) existing combustion chambers at the facility, using a sodium based SO_2 scrubbing system. The CD established emission limits and various associated monitoring, performance testing, recordkeeping, and reporting requirements. The CD also requires the control of H_2SO_4 mist emissions from two (2) existing absorbing towers. This permit is proposing to incorporate the combustion chamber emission control requirements from the CD.

Upon compliance with this permit, the legally and practically enforceable reductions in SO_2 and H_2SO_4 mist emissions can be taken into account when determining the applicability of other Clean Air Act (CAA) requirements, such as the Prevention of Significant Deterioration (PSD) Permit Program at 40 CFR Part 52 and the Title V Operating Permit Program at 40 CFR Part 71 (Part 71).

The EPA has determined that issuance of this MNSR permit will not contribute to National Ambient Air Quality Standards (NAAQS) violations, or have potentially adverse effects on ambient air quality.

Table of Contents

I. Conditional Permit to Construct

A. General Information

Facility:	Chemtrade Logistics, Chemtrade Refinery Services, Inc. (Riverton, Wyoming, Sulfuric Acid Manufacturing Plant)
Permit Number:	SMNSR-WR-000003-2013.001
SIC Code and SIC Description:	2819 – Industrial Inorganic Chemicals, Not Elsewhere Classified

Site Location:
140 Goes In Lodge Road
Near Riverton, Wyoming 82501
Sec 9 T1S R4E
Wind River Indian Reservation
Fremont County, Wyoming
Latitude 42.9988889N, Longitude -108.416111W

Corporate Office Location
Chemtrade Logistics
155 Gordon Baker Road, Suite 300
Toronto, Ontario, Canada M2H 3N5

The equipment listed in this permit may only be operated by Chemtrade Logistics (Chemtrade) at the location described above.

B. Applicability

1. This permit is being issued under authority of the MNSR Permit Program.

2. The requirements in this permit have been created, at the Permittee's request to establish legally and practically enforceable restrictions for limiting opacity, SO_2, and H_2SO_4 mist emissions.

3. Any conditions established for this facility or any specific units at this facility pursuant to any permit issued under the authority of the PSD Permit Program or the MNSR Permit Program shall continue to apply.

4. By issuing this permit, the EPA does not assume any risk of loss which may occur as a result of the operation of the permitted facility by the Permittee, Owner, and/or Operator, if the conditions of this permit are not met by the Permittee, Owner, and/or Operator.

C. Emission Limits

1. The Permittee shall limit emissions from the exhaust stack of Plant #1 as specified in Table 1.

Table 1. Emission Limits for Plant #1

Maximum Emissions During Startups, Not to Exceed 26 hours per event						**Maximum Short-Term Emissions (pounds per ton (lb/ton) of 100% H_2SO_4 produced (average any consecutive 3-hour period))**		**Maximum Visible Emissions (% opacity)**	**Maximum Annual Emissions (tons in any consecutive 12-month period)**
SO_2 lb/ton 100% H_2SO_4 produced (by hours after startup)						SO_2	H_2SO_4 mist		SO_2
1-14	14-15	15-16	16-24	24-25	25-26				
15.0	12.0	9.0	6.0	4.7	3.4	1.9	0.15	<10	35.0

2. The Permittee shall limit emissions from the exhaust stack of Plant #2 as specified in Table 2.

Table 2. Emission Limits for Plant #2

Maximum Emissions During Startups, Not to Exceed 26 hours per event						**Maximum Short-Term Emissions (lb/ton 100% H_2SO_4 produced (average any consecutive 3-hour period))**		**Maximum Visible Emissions (% opacity)**	**Maximum Annual Emissions (tons in any consecutive 12-month period)**
SO_2 lb/ton 100% H_2SO_4 produced (by hours after startup)						SO_2	H_2SO_4 mist		SO_2
1-14	14-15	15-16	16-24	24-25	25-26				
15.0	12.0	9.0	6.0	4.7	3.4	2.1	0.15	<10	38.0

3. Emission limits shall apply at all times, unless otherwise specified in this permit.

D. Control and Operational Requirements

1. The Permittee shall operate and maintain each approved emission unit or activity, including any associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions of MNSR regulated pollutants and considering the manufacturer's recommended operating procedures (or procedures developed by the vendor or Permittee) at all times, including periods of startup, shutdown, maintenance, and malfunction. The EPA will determine whether the Permittee is using acceptable operating and maintenance

procedures based on information available, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the facility

2. The Permittee shall install, operate, and maintain a sodium bicarbonate (soda ash) based SO_2 scrubbing system on both Plant #1 and Plant #2 that is capable of controlling SO_2 emissions such that the emission limits in this permit are met.

3. The Permittee shall install, operate, and maintain an H_2SO_4 mist elimination system on both Plant #1 and Plant #2 that is capable of controlling H_2SO_4 mist emissions such that the emission limits in this permit are met.

4. The Permittee shall install, certify, calibrate, operate, and maintain a continuous emissions monitoring system (CEMS) in the scrubber exhaust stack of both Plant #1 and Plant #2. The CEMS for Plant #1 shall be equipped with a SO_2 analyzer on the scrubber exhaust stack, an in-stack O_2 analyzer, and a flow meter. The CEMS for Plant #2 shall be equipped with a SO_2 analyzer on the scrubber exhaust stack, an inlet converter SO_2 analyzer, and a stack flow meter. Each CEMS shall be capable of directly measuring, calculating, and recording the in-stack volumetric flow rate, the in-stack SO_2 emission rate concentrations, expressed as the average lb/ton of 100% H_2SO_4 produced in any consecutive 3-hour period, and, specific to Plant #1, the in-stack oxygen (O_2) concentration. Each CEMS shall be continuously operated at all times each respective plant is operating or shut down, to demonstrate compliance with the emission limits in this permit, except during CEMS breakdown, repairs, calibration checks, and zero span adjustments.

5. The Permittee shall operate each CEMS in accordance with the respective CEMS plans for each plant in Appendices B and C of this permit.

   (a) The Permittee shall take all steps necessary to avoid CEMS breakdowns and minimize CEMS downtime. This shall include, but is not limited to, operating and maintaining the CEMS in accordance with the CEMS plan, best practices, and maintaining an on-site inventory of spare parts or other supplies necessary to make rapid repairs to the equipment.

   (b) Alternative CEMS plans may be used upon receiving prior written approval of the alternative plan from the EPA. Any alternative CEMS plan shall describe how the Permittee will monitor compliance with the SO_2 emission limits in this permit, including the methodology that will be used to demonstrate compliance in the event of CEMS downtime lasting longer than 24 hours. The EPA may approve or disapprove, in whole or in part, the proposed alternative plan(s). The Permittee shall not implement any modified or alternative CEMS plans that it proposes unless and until the EPA approves the proposed plan or disapproves the proposed plan and requires the Permittee to follow the plan(s) in Appendices B and C of this permit.

6. The Permittee shall follow, for each emissions unit, and associated emissions control equipment and monitoring equipment covered under this permit, the manufacturer's recommended maintenance schedule and procedures, or equivalent procedures developed by the Permittee or vendor, to ensure optimum performance of each emissions unit and its respective emissions control system and monitoring system.

7. The Permittee may rebuild or replace an existing permitted H_2SO_4 manufacturing plant with a plant of the same design and configured to operate in the same manner as the plant being rebuilt or

replaced. Any requirements that applied to the original plant that was rebuilt or replaced shall also apply to the rebuilt or replaced plant.

E. Performance Testing Requirements

1. Performance tests shall be conducted on both Plant #1 and Plant #2 at the facility for measuring the emission rates of SO_2 and H_2SO_4 mist, and for measuring visible emissions, to demonstrate compliance with the emission and opacity limits specified in this permit. The SO_2 and H_2SO_4 mist performance tests shall be conducted in accordance with the EPA Reference Method 8 and Performance Specification 2, in 40 CFR Part 60, Appendices B and C, respectively, or an alternative method approved by the EPA. The visual emissions performance tests shall be conducted in accordance with the EPA Reference Method 9 in 40 CFR Part 60, Appendix A. A continuous opacity monitoring system (COMS) may be used in lieu of EPA Reference Method 9 for demonstrating compliance with the opacity limit at either of the plants. The Permittee may submit to the EPA a written request for approval of an alternate test method, but shall only use that alternate test method after obtaining written approval from the EPA.

   (a) The initial performance tests shall be conducted within 90 calendar days of the effective date of this permit. The results of performance tests conducted prior to the effective date of this permit may be submitted to demonstrate compliance with the initial performance test requirement, provided the tests were conducted in an equivalent manner as the performance test requirements in this permit.

   (b) Subsequent performance tests meeting the performance test requirements in this permit shall be conducted whenever required by the EPA.

   (c) Performance tests shall be conducted within 90 calendar days of startup of all rebuilt or replaced H_2SO_4 manufacturing plants.

2. Performance tests conducted on Plant #1 or Plant #2 for measuring the emission rates of SO_2 and H_2SO_4 mist shall meet the following requirements:

   (a) Permittee shall take all steps necessary to assure accurate measurements of 100% H_2SO_4 production during each test run.

   (b) Each test shall consist of at least nine (9) method test runs and may serve as the CEMS relative accuracy test under Performance Specification 2.

   (c) During each test run, data shall be collected on all parameters necessary to document how emissions were measured or calculated (such as test run length, minimum sample volume, volumetric flow rate, 100% H_2SO_4 production rate, moisture and oxygen corrections, etc.).

   (d) Performance test plans shall be submitted to the EPA for approval 60 calendar days prior to the date the test is planned.

   (e) Performance test plans that have already been approved by the EPA for the emission units approved in this permit may be used in lieu of new test plans unless the EPA requires the submittal and approval of new test plans. The Permittee may submit new test plans for EPA approval at any time.

(f) The test plans shall include and address the following elements:

(i) Purpose of the test;
(ii) Plant (#1 and/or #2) and any respective control systems to be tested;
(iii) Expected plant operating rate(s) during the test;
(iv) Sampling and analysis procedures (sampling locations, test methods, laboratory identification);
(v) Quality assurance plan (calibration procedures and frequency, sample recovery and field documentation, chain of custody procedures); and
(vi) Data processing and reporting (description of data handling and quality control procedures, report content).

3. The Permittee shall not abort any tests that demonstrate non-compliance with the emission limits specified in this permit.

4. The Permittee shall notify the EPA at least 30 calendar days prior to scheduled performance testing. The Permittee shall notify the EPA at least 1 week prior to scheduled performance testing if the testing cannot be performed.

5. If the results of a complete and valid performance test of the emissions from Plant #1 or Plant #2 demonstrate noncompliance with the emission limits specified in this permit, the plant shall be shut down as soon as safely possible, and appropriate corrective action shall be taken (e.g., repairs, component cleaning, component replacement). The Permittee shall notify the EPA in writing within 24 hours of each such shut down. The plant must be retested within 7 days of being restarted and the emissions must meet the applicable limits in this permit. If the retest shows that the emissions continue to exceed the limits specified in this permit, the plant shall again be shut down as soon as safely possible, and the plant may not operate, except for purposes of startup and testing, until the Permittee demonstrates through testing that the emissions do not exceed the emission limits specified in this permit.

F. Monitoring Requirements

1. The Permittee shall monitor and record the in-stack SO_2 emission rate concentration from each Plant #1 and Plant #2, both expressed as lb/ton of 100% H_2SO_4 produced in any consecutive 3-hour time period, using a CEMS in accordance with the applicable CEMS Plan in Appendices B or C of this permit, to demonstrate continuous compliance with the short-term SO_2 emission limits in this permit.

2. To demonstrate continuous compliance with the annual SO_2 emission limits in this permit, the Permittee shall calculate the amount of SO_2 emitted in tons each calendar month that Plant #1 and Plant #2 operate under this permit, beginning with the first calendar month that this permit is effective, no later than the 15th day of the following calendar month. Calculations shall be conducted in accordance with the applicable CEMS plan in Appendices B or C. Emissions during the processes of startups, shutdowns, maintenance, and malfunctions shall be included in calculating the total tons per year emitted from each plant. Prior to 12 full months of operation under this permit, for each plant, the Permittee shall add the emissions for each month to the emissions for the preceding months operated under this permit. Thereafter, no later than the 15th day of each month, the Permittee shall calculate the amount of SO_2 emitted from each plant for the immediately preceding 12-month period.

3. At least once during each calendar week in which the permitted source operates, the Permittee shall perform a visible emissions survey of the scrubber exhaust stacks of Plant #1 and Plant #2 to demonstrate continuous compliance with the opacity limits in this permit. The survey shall be performed during daylight hours, while the facility is operating, and by an individual trained in EPA Reference Method 22 of 40 CFR Part 60, Appendix A. A COMS may be used in lieu of weekly visible emissions surveys for demonstrating compliance with the opacity limit at either of the plants. Visible emissions are observed if a visible plume from the scrubber exhaust stack is observed for more than 2 minutes in any 1 hour. If visible emissions are detected during the survey (or by a COMS), the Permittee shall either:

   (a) Take corrective action so that within 24 hours no visible emissions are detected from the scrubber exhaust stacks of both Plant #1 or Plant #2 while they are in operation; or

   (b) Take corrective action and if within 24 hours visible emissions are still detected, for each plant that discharged visible emissions during the survey, demonstrate compliance with the opacity limits in this permit using EPA Reference Method 9 by an individual trained and certified in Method 9.

G. Recordkeeping Requirements

The Permittee shall keep the following records:

1. All specifications and maintenance requirements developed by the manufacturer, vendor, or Permittee for Plant #1, Plant #2, and each associated emission control and monitoring device required in this permit.

2. All calibration, maintenance, repairs, rebuilds or replacements conducted for Plant #1, Plant #2, and each associated emission control and monitoring device required in this permit.

3. The results of all required performance testing and monitoring in this permit. The records shall include the following:

   (a) The date, place, and time of sampling or measurements;

   (b) The date(s) analyses were performed;

   (c) The company or entity that performed the analyses;

   (d) The analytical techniques or methods used;

   (e) The results of such analyses or measurements; and

   (f) The operating conditions as existing at the time of sampling or measurement.

4. All monthly and 12-month consecutive SO_2 emissions for both Plant #1 and Plant #2 and all information used to calculate the values.

5. All deviations of permit requirements, a description of the probable cause of the deviation, and any corrective actions or preventative measures taken.

H. Records Retention Requirements

1. The Permittee shall retain all records required by this permit for a period of at least 5 years from the date the record was created.

2. Records shall be kept in the vicinity of the facility, such as at the facility, the location that has day-to-day operational control over the facility, or the location that has day-to-day responsibility for compliance of the facility.

I. Reporting Requirements

1. Annual Emission Reports

   (a) The Permittee shall submit a written annual report of the actual annual SO_2 emissions in tons from Plant #1 and Plant #2 each year no later than April 1st. The annual report shall cover the period for the previous calendar year. All reports must be certified to truth and accuracy by the person primarily responsible for CAA compliance for the Permittee.

   (b) The report shall be submitted to:

   U.S. Environmental Protection Agency, Region 8
   Office of Partnerships and Regulatory Assistance
   Tribal Air Permitting Program, 8P-AR
   1595 Wynkoop Street
   Denver, Colorado 80202

   The report may be submitted via electronic mail to r8AirPermitting@epa.gov.

2. All other documents required to be submitted under this permit, with the exception of the Annual Emission Reports, shall be submitted to:

   U. S. Environmental Protection Agency, Region 8
   Office of Enforcement, Compliance & Environmental Justice
   Air Toxics and Technical Enforcement Program, 8ENF-AT
   1595 Wynkoop Street
   Denver, Colorado 80202

   Documents may be submitted electronically to r8airreportenforcement@epa.gov.

3. The Permittee shall promptly submit to the EPA a written report of any deviations of permit requirements, a description of the probable cause of such deviations, and any corrective actions or preventative measures taken. A "prompt" deviation report is one that is postmarked or submitted via electronic mail to r8airreportenforcement@epa.gov as follows:

   (a) Within 30 days from the discovery of any deviation of the emission limits or operational limits that are left uncorrected for more than 24 hours after discovering the deviation; and

   (b) By April 1st for the discovery of a deviation of recordkeeping or other permit conditions during the preceding calendar year that do not affect the Permittee's ability to meet the emission limits.

4. The Permittee shall submit a written report for any required performance tests to the EPA within 60 days after completing the tests.

5. The Permittee shall submit any record or report required by this permit upon EPA request.

II. General Provisions

A. Conditional Approval:

Pursuant to the authority of 40 CFR 49.151, the EPA hereby conditionally grants this permit. This authorization is expressly conditioned as follows:

1. *Document Retention and Availability:* This permit and any required attachments shall be retained and made available for inspection upon request at the location set forth herein.

2. *Permit Application:* The Permittee shall abide by all representations, statements of intent and agreements contained in the application submitted by the Permittee. The EPA shall be notified 10 days in advance of any significant deviation from this permit application as well as any plans, specifications, or supporting data furnished.

3. *Permit Deviations:* The issuance of this permit may be suspended or revoked if the EPA determines that a significant deviation from the permit application, specifications, and supporting data furnished has been or is to be made. If the proposed source is constructed, operated, or modified not in accordance with the terms of this permit, the Permittee will be subject to appropriate enforcement action.

4. *Compliance with Permit:* The Permittee shall comply with all conditions of this permit, including emission limitations that apply to the affected emissions units at the permitted facility/source. Noncompliance with any permit term or condition is a violation of this permit and may constitute a violation of the CAA and is grounds for enforcement action and for a permit termination or revocation.

5. *Fugitive Emissions:* The Permittee shall take all reasonable precautions to prevent and/or minimize fugitive emissions during the construction period.

6. *National Ambient Air Quality Standards and PSD Increments:* The permitted source shall not cause or contribute to a NAAQS violation or a PSD increment violation.

7. *Compliance with Federal and Tribal Rules, Regulations, and Orders:* Issuance of this permit does not relieve the Permittee of the responsibility to comply fully with all other applicable federal and tribal rules, regulations, and orders now or hereafter in effect.

8. *Enforcement:* It is not a defense, for the Permittee, in an enforcement action, to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

9. *Modifications to Existing Permitted Emissions Units/Limits:* For proposed modifications, as defined at 40 CFR 49.152(d), that would increase an emissions unit's allowable emissions of pollutants above its existing permitted annual allowable emissions limit, the Permittee shall first obtain a permit modification pursuant to the MNSR regulations approving the increase. For a proposed modification that is not otherwise subject to review under the PSD or MNSR regulations, such proposed increase in the annual allowable emissions limit shall be approved through an administrative permit revision as provided at 40 CFR 49.159(f).

10. *Relaxation of Legally and Practically Enforceable Limits:* At such time that a new or modified source within this permitted facility/source or modification of this permitted facility/source becomes a major stationary source or major modification solely by virtue of a relaxation in any legally and practically enforceable limitation which was established after August 7, 1980, on the capacity of the permitted facility/source to otherwise emit a pollutant, such as a restriction on hours of operation, then the requirements of the PSD regulations shall apply to the source or modification as though construction had not yet commenced on the source or modification.

11. *Revise, Reopen, Revoke and Reissue, or Terminate for Cause:* This permit may be revised, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee, for a permit revision, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. The EPA may reopen this permit for a cause on its own initiative, e.g., if this permit contains a material mistake or the Permittee fails to assure compliance with the applicable requirements.

12. *Severability Clause:* The provisions of this permit are severable, and in the event of any challenge to any portion of this permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force.

13. *Property Rights:* This permit does not convey any property rights of any sort or any exclusive privilege.

14. *Information Requests:* The Permittee shall furnish to the EPA, within a reasonable time, any information that the EPA may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating this permit or to determine compliance with this permit. For any such information claimed to be confidential, the Permittee shall also submit a claim of confidentiality in accordance with 40 CFR Part 2, Subpart B.

15. *Inspection and Entry:* The EPA or its authorized representatives may inspect this permitted facility/source during normal business hours for the purpose of ascertaining compliance with all conditions of this permit. Upon presentation of proper credentials, the Permittee shall allow the EPA or its authorized representative to:

    (a) Enter upon the premises where this permitted facility/source is located or emissions-related activity is conducted, or where records are required to be kept under the conditions of this permit;

    (b) Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of this permit;

(c) Inspect, during normal business hours or while this permitted facility/source is in operation, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or other applicable requirements; and

(e) Record any inspection by use of written, electronic, magnetic and photographic media.

16. *Permit Effective Date:* This permit is effective immediately upon issuance unless comments resulted in a change in the proposed permit, in which case the permit is effective 30 days after issuance. The Permittee may notify the EPA, in writing, that this permit or a term or condition of it is rejected. Such notice should be made within 30 days of receipt of this permit and should include the reason or reasons for rejection.

17. *Permit Transfers:* Permit transfers shall be made in accordance with 40 CFR 49.159(f). The Air Program Director shall be notified in writing at the address shown below if the company is sold or changes its name.

U.S. Environmental Protection Agency, Region 8
Office of Partnerships and Regulatory Assistance
Tribal Air Permitting Program, 8P-AR
1595 Wynkoop Street
Denver, Colorado 80202

18. *Invalidation of Permit:* Unless this permitted source of emissions is an existing source, this permit becomes invalid if construction is not commenced within 18 months after the effective date of this permit, construction is discontinued for 18 months or more, or construction is not completed within a reasonable time. The EPA may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between the construction of the approved phases of a phased construction project. The Permittee shall commence construction of each such phase within 18 months of the projected and approved commencement date.

19. *Notification of Startup:* The Permittee shall submit a notification of the anticipated date of initial startup of this permitted source to the EPA within 60 days of such date, unless this permitted source of emissions is an existing source.

B. Authorization:

Authorized by the United States Environmental Protection Agency, Region 8

8/27/15

Darcy O'Connor
Acting Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

Date

Appendix A

Definitions

All terms not defined herein shall have the meaning given them in the CAA, in 40 CFR parts 60, 61, and 63, in the PSD regulations at 40 CFR Part 52, or in the MNSR regulations at 40 CFR Part 49. The following terms shall have the specific meanings given them. Definitions in this section were taken or derived from the definitions for the equivalent word in 40 CFR Parts 60 and 63, or from commonly used English language dictionaries. For the purposes of this permit to construct, including associated Appendices A and B:

Facility means the site at which all of the emissions units and emissions-generating activities covered under this permit are located.

Maintenance means the routine recurring work required to keep an emissions unit in such condition that it may be continuously utilized, at its original or designed capacity and efficiency, for its intended purpose.

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Mass cap means the maximum amount of SO_2 emissions for Plant #1 or Plant #2, expressed in tons of SO_2 emitted during each consecutive 12-month period consisting of the most recently concluded month and the 11 months immediately preceding.

Month means calendar month.

100% H_2SO_4 produced means the stoichiometric quantity of H_2SO_4 that would be produced at Plant #1 or Plant #2 if all SO_3 exiting the converter were used to produce H_2SO_4 monohydrate. For purposes of this definition, scrubber byproduct (if any) shall be considered to be included in "100% H_2SO_4 produced".

Operating periods means periods during which sulfur or sulfur-bearing compounds are being fed to the furnace of Plant #1 or Plant #2.

Permittee means the owner or operator of the permitted source.

Permitted source means the facility for which the EPA has issued this permit to construct.

Plant means, H_2SO_4 Manufacturing Plant #1 or Plant #2.

Shutdown means the cessation of operation of an affected facility for any purpose.

Startup means, with respect to Plant #1 or Plant #2, the period of time beginning when the feed of sulfur or sulfur-bearing compounds to the furnace commences and lasts for no more than 24 hours.

Sulfur or sulfur-bearing compounds means elemental sulfur, alkylation or other spent sulfuric acids, hydrogen sulfide, organic sulfides, mercaptans, or acid sludge, but excludes hydrocarbon and conventional fossil fuels such as natural gas or fuel oil.

Sulfuric acid manufacturing plant means a process unit engaged in the production of H_2SO_4 and related products using the contact process.

Appendix B

CHEMTRADE REFINERY SERVICES, INC.
RIVERTON FACILITY: SULFURIC ACID PLANT #1
Continuous Emissions Monitoring System (CEMS) Plan for SO_2 Emissions
Single Absorption Sulfur Burning Plant with SO_2 Scrubber

Principle

This CEMS Plan is the mechanism for determining compliance with all sulfur dioxide (SO_2) emission limits in this permit for the Sulfuric Acid Plant #1 at the Riverton, Wyoming Facility (Plant #1). The methodology described in this CEMS Plan will provide a real-time indication of compliance with the emission limits established in this permit, by determining the emission rate both in terms of pounds of SO_2 emitted per unit of time and pounds of SO_2 emitted per ton of 100% H_2SO_4 produced. The system will use three analyzers: one to measure stack SO_2 concentration, one to measure stack oxygen (O_2) concentration, and one to measure stack volumetric flow rate. From these data, the emission rate, expressed as both pounds per unit of time and lb/ton, shall be directly calculated using Equations 1, 2, and 3 below.

Equation 1:

$$M_{SO_2Stack} = Q_{Stack} \cdot B \cdot \frac{64.058\ {}^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol}}$$

Equation 2:

$$P_{TonsH_2SO_4} = Q_{Stack} \cdot 0.843 \cdot (0.209 - Y - B) \cdot \frac{98.0734\ {}^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol} \cdot 2000\ {}^{lbs}/_{Ton}}$$

Equation 3:

$$E_{lbs/ton} = \frac{M_{SO_2Stack}}{P_{TonsH_2SO_4}} = \frac{Q_{Stack} \cdot B}{Q_{Stack} \cdot 0.843 \cdot (0.209 - Y - B)} \cdot 1306.33\ \frac{lbsSO_2}{TonAcid}$$

Where:

$P_{TonsH_2SO_4}$ = 100% H_2SO_4 Produced, tons per unit of time

M_{SO_2Stack} = Mass SO_2 stack emission rate, lb per unit of time

Q_{Stack} = Volumetric flow rate of stack gas, dry standard cubic feet (DSCF) per unit of time

Y = Stack O_2 concentration, fraction (dry basis)

B = Stack SO_2 concentration, fraction

$E_{lbs/ton}$ = lb SO_2 per ton 100% H_2SO_4 Produced

$98.0734\ {}^{lbs}/_{lb-mol}$ = Molecular weight of H_2SO_4

$64.058\ {}^{lbs}/_{lb-mol}$ = Molecular weight of SO_2

$1306.33\ \frac{lbsSO_2}{TonAcid} = \frac{64.058\ {}^{lbs}/_{lb-mol} \cdot 2000\ {}^{lbs}/_{ton}}{98.0734\ {}^{lbs}/_{lb-mol}}$

$385.57\ \frac{SCF}{lb-mol}$ = Volume of one lb-mole of gas at standard temperature and pressure (68°F and 14.696 psia), cubic feet

The mass emission rate equation (Equation 1) calculates the SO_2 mass emission rate by multiplying the total stack gas flow rate by the stack SO_2 concentration. The 100% H_2SO_4 production rate equation (Equation 2) is based on a material balance of the contact process and the fact that the ratio of O_2 to nitrogen of the incoming air is fixed. The lb/ton equation (Equation 3) is the ratio of the mass SO_2 emission rate to the 100% H_2SO_4 production rate.

The benefit of using this method is the ability to obtain information regarding the SO_2 mass emission rate, the fact that lb/ton measurements will be "weighted" based on the flow rate during each measurement, and the elimination of errors associated with measuring sulfuric acid flow and using converter inlet Reich testing.

Definitions

The terms used in this CEMS Plan that are defined in the Clean Air Act (CAA) or in federal or state regulations promulgated pursuant to the CAA shall have the meaning assigned to them in the CAA or such regulations, unless otherwise defined in this permit. Terms used in this CEMS Plan that are defined in this permit shall have the meaning assigned to them therein.

Emissions Monitoring

- Emissions monitoring will be done using an O_2 analyzer at the exit stack, an SO_2 analyzer at the exit stack, and a stack flow rate analyzer. Except for analyzer malfunctions, associated repairs, and required quality assurance or control activities (including calibration checks and required zero and span adjustments), the Permittee will conduct monitoring during all operating periods and during shutdown.

- Once every 5 minutes, the analyzers will measure the stack SO_2 concentration (fraction, dry basis), the stack O_2 concentration (fraction, dry basis) and the volumetric flow rate (dry standard cubic feet per minute).

- During routine calibration checks and adjustments of the SO_2 and O_2 analyzers, the SO_2 and O_2 measurements will be "frozen" at their pre-calibration level and these measurements will be used to fill in any analyzer data gaps that occur pending completion of the calibration checks and adjustments.

- If any one or more than one analyzer is (are) not operating for a period of 24 hours or greater, data gaps in the array involving the non-operational analyzer(s) will be filled in as follows:

    - Exit stack gas will be sampled and analyzed for SO_2 at least once per hour, during all operating periods. Sampling will be conducted by Reich test or other established method (*e.g.*, portable analyzer). The most recent hourly reading will be substituted for the 12 five-minute readings that would otherwise have been taken if the analyzer had been operating normally.

    - O_2 in the exit stack gas will be sampled and analyzed at least once per hour, during all Operating Periods. Sampling will be conducted by Orsat test or other established method (*e.g.*, portable analyzer). The most recent hourly reading will be substituted for the 12

five-minute readings that would otherwise have been taken if the analyzer had been operating normally.

- Stack volumetric flow rate will be estimated using engineering judgment.

- If any one or more than one analyzer is (are) not operating for a period of less than 24 hours, one of the following must be done: (i) the requirements set forth for a 24-hour or greater period of downtime must be used to fill in the data gaps; or (ii) the data recorded for the 5-minute reading immediately preceding the affected analyzers(s)'s stoppage must be used to fill in the data gap.

- In order to secure data on a "dry basis," the Permittee may either:

  (i) Directly measure the moisture content using a moisture meter; or
  (ii) Assume the moisture content is the greater of 3% or the highest measured moisture content in any Relative Accuracy Test Audit (RATA).

Emissions Calculations

3-Hour Rolling Average

For purposes of calculating a 3-hour rolling average, the system will maintain an array of the 36 most recent measurements of each of the three monitored parameters. Every 5 minutes, the system will add the most recent readings to the array and exclude the oldest readings.

The 3-hour rolling hour average lb/ton SO_2 emission rate (E_{3hravg}) will be calculated using Equation 4.

Equation 4:

$$E_{3hravg} = 1306.33 \frac{lbsSO_2}{TonAcid} \cdot \frac{\sum_{i=1}^{36} Q_{Stack\ i} \cdot B_i}{\sum_{i=1}^{36} Q_{Stack\ i} \cdot 0.843 \cdot [0.209 - Y_i - B_i]}$$

Where:

Y_i : Stack O_2 concentration, fraction (dry basis) at measurement "*i*"

B_i : Stack SO_2 concentration, fraction (dry basis) at measurement "*i*"

$Q_{Stack\ i}$: Stack volumetric flow rate, dry standard cubic feet per minute (DSCFM) at measurement "*i*"

$1306.33 \frac{lbsSO_2}{TonAcid}$: $\frac{64.058\ {}^{lbs}/_{lb-mol} \cdot 2000\ {}^{lbs}/_{ton}}{98.0734\ {}^{lbs}/_{lb-mol}}$

E_{3hravg} : 3-hour average lb SO_2 per ton 100% H_2SO_4 produced *(i.e.,* the average of 36 measurements taken at 5-minute intervals)

Daily Mass SO_2 Emissions

The daily mass SO_2 emissions (M_{SO_2Day}) (which are based on a calendar day) will be calculated using Equation 5.

Equation 5:

$$M_{SO_2Day} = \sum_{i=1}^{n} Q_{Stack\,i} \cdot B_i \cdot \frac{64.058\ {}^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol}} \cdot 5\,\text{min}$$

Where:

B_i : Stack SO_2 concentration, fraction (dry basis) at measurement "*i*"

Q_{Stacki} : Stack volumetric flow rate, DSCFM at measurement "*i*"

M_{SO_2Day} : Mass emissions of SO_2 during a calendar day, lb

n : Number of measurements in a given calendar day

12-Month Rolling Sum Mass SO_2 Emissions

The 12-month rolling sum mass SO_2 emissions ($M_{SO_2 12Mo\,Sum}$) for the immediately preceding month will be calculated, by no later than the 15th day of each month, using Equation 6:

Equation 6:

$$M_{SO_2 12Mo\,Sum} = \sum_{j=1}^{d} M_{SO_2Day\,j}$$

Where:

$M_{SO_2Day\,j}$: Mass emissions of SO_2 during calendar day "*j*", lb

d : Number days in the preceding 12 calendar months

$M_{SO_2 12Mo\,Sum}$: 12-month rolling sum of SO_2 emitted into the atmosphere, lb

Rounding of Numbers resulting from Calculations

Upon completion of the calculations, the final numbers shall be rounded as follows:

E_{3hravg}: Rounded to the nearest tenth.

$M_{SO_2 12Mo\,Sum}$: Rounded to the nearest tenth of a ton (*i.e.*, 200 lb).

The number "5" shall be rounded up (*e.g.,* a short-term rate of 2.05011 shall be rounded to 2.1).

Rounding of Variables B , Q_{Stack}, and Y

Rounding of the variables identified as B , Q_{Stack}, and Y in the equations set forth in this CEMS Plan shall be done based on the accuracy of the measuring device as provided by the manufacturer of the device.

Compliance with Permit SO_2 Limits

Short-Term SO_2 Limits

The short-term limit shall not apply during startup, shutdown, or malfunction of Plant #1. During all other operating periods the Permittee shall be in compliance with the short-term SO_2 permit limit if E_{3hravg} does not exceed 1.90 lb of SO_2 per ton of 100% H_2SO_4 produced. If the Permittee contends that emissions during a malfunction(s) resulted in a calculated 3-hour rolling average emission rate(s) in excess of 1.9 lb/ton after the period of the malfunction(s) end(s), the Permittee shall recalculate E_{3hravg} to exclude measurements recorded during the period(s) of the claimed malfunction(s).

Startup SO_2 Emission Limits

The Permittee shall be in compliance with the SO_2 emission limits during startup if E_{3hravg} does not exceed the limits for Plant #1 set forth in Table 1 of this permit.

Mass Cap for SO_2

The Permittee shall be in compliance with the mass cap if the 12-month rolling sum ($M_{SO_2 12Mo\ Sum}$) is 35.0 tons (70,000 lb) of SO_2 or less.

Recordkeeping and Reporting

In addition to any requirements in this permit, the Permittee shall maintain records of the date, time, and duration that any of the three analyzers required under this CEMS Plan are not operating. In each annual report required under this permit, the Permittee shall identify all periods of analyzer downtime during the reporting period and all data during the reporting period that is "substitute" data. "Substitute" data means data that is not generated contemporaneously by an analyzer at the same time as the gas flow stack (or duct) emissions are being measured, but rather, is substituted for contemporaneous analyzer measurements consistent with the provisions of the "Emissions Monitoring" section of this CEMS plan when an analyzer is not operating.

Retention of all CEMS data, including data during startup, shutdown, and malfunction

The Permittee shall retain all data generated by its SO_2 and O_2 analyzers, including all data generated during startup, shutdown, and/or malfunction of Plant #1 in accordance with this permit.

Analyzer Specifications

The three analyzers shall meet the following specifications:

Table 1

Parameter	**Location**	**Range**
SO_2, mole fraction, dry basis	Stack	Dual range: Normal: 0 – 500 ppm SO_2 SSM: 0 – 3,600 ppm SO_2
O_2, mole fraction, dry basis	Stack	Single range: 0 – 20.9 % O_2
Volumetric flow rate, DSCFM	Stack	0 to 125% of the maximum expected volumetric flow rate

The stack SO_2 analyzer shall meet all applicable requirements of 40 CFR 60.11, 60.13, 40 CFR Part 60, Appendix B, Performance Specification 2, and the Quality Assurance and Quality Control Procedures in 40 CFR Part 60, Appendix F, Procedure 1.

The stack O_2 analyzer shall meet 40 CFR Part 60 Appendix B, Performance Specification 3 and the Quality Assurance and Quality Control Procedures in 40 CFR Part 60, Appendix F, Procedure 1.

The volumetric flow rate analyzer shall meet 40 CFR Part 60, Appendix B, Performance Specification 6 and the Quality Assurance and Quality Control Procedures in 40 CFR Part 60, Appendix F, Procedure 1.

Appendix C

CHEMTRADE REFINERY SERVICES, INC.
RIVERTON FACILITY: SULFURIC ACID PLANT #2
Continuous Emissions Monitoring System (CEMS) Plan for SO_2 Emissions
Single Absorption Sulfuric Acid Regeneration Plant with Air Injection and SO_2 Scrubber

Principle

This CEMS Plan is the mechanism for determining compliance with all SO_2 emission limits in this permit for the Sulfuric Acid Plant #2 at the Riverton, Wyoming Facility (Plant #2). The methodology described in this CEMS Plan will provide a real-time indication of compliance with the emission limits established in this permit by determining the emission rate in terms of both pounds of SO_2 emitted per unit of time and pounds of SO_2 emitted per ton of 100% H_2SO_4 produced (lb/ton). The system shall utilize three analyzers: one to measure the converter inlet SO_2 concentration, one to measure stack SO_2 concentration, and one to measure stack volumetric flow rate. From these data, the emission rate, expressed as both pounds per unit of time and lb/ton, shall be directly calculated using Equations 1, 2, and 3 below.

Equation 1:

$$M_{SO_2Stack} = Q_{Stack} \cdot B \cdot \frac{64.058\ {}^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol}}$$

Equation 2:

$$P_{TonsH_2SO_4} = Q_{Stack} \cdot \left[\frac{A - B \cdot (1+R)}{1+R-(1.5 \cdot A)}\right] \cdot \frac{98.0734\ {}^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol} \cdot 2000\ {}^{lbs}/_{Ton}}$$

Equation 3:

$$E_{lbs/ton} = \frac{M_{SO_2Stack}}{P_{TonsH_2SO_4}} = \frac{Q_{Stack} \cdot B}{Q_{Stack} \cdot \left[\frac{A - B \cdot (1+R)}{1+R-(1.5 \cdot A)}\right]} \cdot 1306.33\ \frac{lbsSO_2}{TonAcid}$$

Where:

$P_{TonsH_2SO_4}$	= 100% H_2SO_4 production, tons per unit of time
M_{SO_2Stack}	= Mass SO_2 stack emission rate, lb per unit of time
Q_{Stack}	= Volumetric flow rate of stack gas, dry standard cubic feet (DSCF) per unit of time
A	= Converter inlet SO_2 concentration, fraction (dry basis)
B	= Stack SO_2 concentration, fraction (dry basis)
R	= Ratio of the flow rate of gas fed into first bed of the converter to the flow rate of dilution air injected into lower beds
$E_{lbs/ton}$	= lb SO_2 per ton 100% H_2SO_4 produced
$98.0734\ {}^{lbs}/_{lb-mol}$	= Molecular weight of sulfuric acid
$64.058\ {}^{lbs}/_{lb-mol}$	= Molecular weight of SO_2

$$1306.33 \frac{lbs SO_2}{Ton Acid} = \frac{64.058 \, lbs/lb\text{-}mol \cdot 2000 \, lbs/ton}{98.0734 \, lbs/lb\text{-}mol}$$

$$38557 \frac{SCF}{lb\text{-}mol}$$ = Volume of one lb-mole of gas at standard temperature and pressure (68˚F and 14.696 psia), cubic feet

The mass emission rate equation (Equation 1) calculates the SO_2 mass emission rate by multiplying the total stack gas flow rate by the stack SO_2 concentration. The 100% H_2SO_4 production rate equation (Equation 2) is based on a material balance of the contact process. The lb/ton equation (Equation 3) is the ratio of the SO_2 emission rate to the 100% H_2SO_4 production rate. Because Plant #2 injects air into the lower passes of its converter, the equations have been adjusted to account for this added air.

The benefit of using this method is the ability to obtain information regarding the SO_2 mass emission rate, the fact that lb/ton measurements will be "weighted" based on the flow rate during each measurement, and the elimination of errors associated with measuring sulfuric acid flow and using converter inlet Reich testing.

Definitions

The terms used in this CEMS Plan that are defined in the Clean Air Act (CAA) or in federal or state regulations promulgated pursuant to the CAA shall have the meaning assigned to them in the CAA or such regulations, unless otherwise defined in this permit. Terms used in this CEMS Plan that are defined in this permit shall have the meaning assigned to them therein.

Emissions Monitoring

- Emissions monitoring shall be done using an SO_2 analyzer at the converter inlet, an SO_2 analyzer at the exit stack, and a stack flow rate analyzer. Except for analyzer malfunctions, associated repairs, and required quality assurance or control activities (including calibration checks and required zero and span adjustments), the Permittee shall conduct monitoring during all operating periods and during shutdown.

- Once every five minutes, the analyzers shall measure the stack SO_2 concentration (fraction, dry basis), the converter inlet SO_2 concentration (fraction, dry basis) and the volumetric flow rate (dry standard cubic feet per minute).

- During routine calibration checks and adjustments of the SO_2 analyzers, the SO_2 measurement shall be "frozen" at its pre-calibration level and this measurement shall be used to fill in any analyzer data gaps that occur pending completion of the calibration checks and adjustments.

- If any one or more than one analyzer is/are not operating for a period of 24 hours or greater, data gaps in the array involving the non-operational analyzer(s) shall be filled in as follows:

    - Exit stack gas will be sampled and analyzed for SO_2 at least once per hour, during all operating periods. Sampling will be conducted by Reich test or other established method (*e.g.*, portable analyzer). The most recent hourly reading will be substituted for the 12 five-minute readings that would otherwise have been taken if the analyzer had been operating normally.

- Converter inlet gas either shall be sampled and analyzed for SO_2 using a Reich test or other established method, or the concentration shall be estimated using engineering judgment, at least once every 4 hours during all operating periods. The most recent 4-hour measurement/estimate shall be substituted for the 48 five-minute readings that would otherwise have been taken if the system had been operating normally.

- Stack volumetric flow rate shall be estimated using engineering judgment.

- If any one or more than one analyzer is/are not operating for a period of less than 24 hours, one of the following shall be done: (i) the requirements set forth for a 24-hour or greater period of downtime must be used to fill in the data gaps; or (ii) the data recorded for the 5- minute reading immediately preceding the affected analyzer's stoppage shall be used to fill in the data gap.

- In order to secure data on a "dry basis," the Permittee may either;

  (i) Directly measure the moisture content using a moisture meter; or
  (ii) Assume the moisture content is the greater of 3% or the highest measured moisture content in any Relative Accuracy Test Audit ("RATA").

Emissions Calculations

3-Hour Rolling Average

For purposes of calculating a 3-hour rolling average, the system shall maintain an array of the 36 most recent measurements of each of the three monitored parameters. Every 5 minutes, the system shall add the most recent readings to the array and exclude the oldest readings.

The 3-hour rolling average lb/ton SO_2 emission rate (E_{3hravg}) shall be calculated using Equation 4.

Equation 4:

$$E_{3hravg} = 1306.33 \frac{lbsSO_2}{TonAcid} \cdot \frac{\sum_{i=1}^{36} Q_{Stack\,i} \cdot B_i}{\sum_{i=1}^{36} Q_{Stack\,i} \cdot \left[\frac{A_i - B_i \cdot (1+R)}{1+R-1.5 \cdot A_i} \right]}$$

Where:

A_i = Converter inlet SO_2 concentration, fraction (dry basis) at measurement "*i*"

B_i = Stack SO_2 concentration, fraction (dry basis) at measurement "*i*"

$Q_{Stack\,i}$ = Stack volumetric flow rate, dry standard cubic feet per minute (DSCFM) at measurement "*i*"

R = Average of the three most recent measurements of the ratio of the flow of dilution air to the flow of process gas to the converter

$$1306.33 \frac{lbsSO_2}{TonAcid} = \frac{64.058\ {}^{lbs}/_{lb-mol} \cdot 2000\ {}^{lbs}/_{ton}}{98.0734\ {}^{lbs}/_{lb-mol}}$$

E_{3hravg} = 3-hour average lb SO_2 per ton 100% Sulfuric Acid Produced *(i.e.,* the average of 36 measurements taken at 5-minute intervals)

Daily Mass SO_2 Emissions

The daily mass SO_2 emissions (M_{SO_2Day}) (which are based on a calendar day) shall be calculated using Equation 5.

Equation 5:

$$M_{SO_2Day} = \sum_{i=1}^{n} Q_{Stack\ i} \cdot B_i \cdot \frac{64.058\ ^{lbs}/_{lb-mol}}{385.57\ \frac{SCF}{lb-mol}} \cdot 5\,\text{min}$$

Where:

B_i = Stack SO_2 concentration, fraction (dry basis) at measurement "*i*"

$Q_{Stack\ i}$ = Stack volumetric flow rate, dry standard cubic feet per minute (DSCFM) at measurement "*i*"

M_{SO_2Day} = Mass emissions of SO_2 during a calendar day, lb

n = Number of measurements in a given calendar day

12-Month Rolling Sum Mass SO_2 Emissions

The 12-month rolling sum mass SO_2 emissions ($M_{SO_2 12Mo\ Sum}$) for the immediately preceding month shall be calculated, by no later than the 15th day of each month, using Equation 6:

Equation 6:

$$M_{SO_2 12Mo\ Sum} = \sum_{j=1}^{d} M_{SO_2Day\ j}$$

Where:

$M_{SO_2Day\ j}$ = Mass emissions of SO_2 during calendar day "*j*", lb

d = Number days in the preceding 12 calendar months

$M_{SO_2 12Mo\ Sum}$ = 12-month rolling sum of SO_2 emitted into the atmosphere, lb

Rounding of Numbers resulting from Calculations

Upon completion of the calculations, the final numbers shall be rounded as follows:

E_{3hravg}: Rounded to the nearest tenth.

$M_{SO_2 12Mo\ Sum}$: Rounded to the nearest tenth of a ton (*i.e.*, 200 lb).

The number "5" shall be rounded up (*e.g.,* a short-term rate of 2.05011 shall be rounded to 2.1).

Rounding of Variables A , B , and Q_{Stack}

Rounding of the variables identified as A , B , and Q_{Stack} in the equations set forth in this CEMS Plan shall be done based on the accuracy of the measuring device as provided by the manufacturer of the device.

Compliance with Permit SO_2 Limits

Short-Term SO_2 Limits

The short-term limit shall not apply during periods of startup, shutdown, or malfunction. During all other operating periods, the Permittee will be in compliance with the short-term SO_2 permit limit if E_{3hravg} does not exceed 2.1 lb of SO_2 per ton of 100% H_2SO_4 produced. If the Permittee contends that emissions during a malfunction(s) resulted in a calculated 3-hour rolling average emission rate(s) in excess of 2.1 lb/ton after the period of the malfunction(s) end(s), the Permittee shall recalculate E_{3hravg} to exclude measurements recorded during the period(s) of the claimed malfunction(s).

Startup SO_2 Emission Limits

The Permittee shall be in compliance with the SO_2 emission limits during startup if E_{3hravg} during startup does not exceed the limits for Plant #2 set forth in this permit.

Mass Cap for SO_2

The Permittee shall be in compliance with the mass cap if the 12-month rolling sum ($M_{SO_2 12Mo\ Sum}$) is 38.0 tons (76,000 lb) of SO_2 or less during each consecutive 12-month period.

Recordkeeping and Reporting

In addition to any requirements in this permit, the Permittee shall maintain records of the date, time, and duration that any of the three analyzers required under this CEMS Plan are not operating. In each annual report required under this permit, the Permittee specifically shall identify all periods of analyzer downtime during the reporting period and all data during the reporting period that is "substitute" data. "Substitute" data means data that is not generated contemporaneously by an analyzer at the same time as the gas flow stack (or duct) emissions are being measured, but rather, is substituted for contemporaneous analyzer measurements consistent with the provisions of the "Emissions Monitoring" section of this CEMS plan when an analyzer is not operating.

Retention of All CEMS Data, including Data during Startup, Shutdown, and Malfunction

The Permittee shall retain all data generated by its SO_2 and volumetric flow rate analyzers, including all data generated during startup, shutdown, and/or malfunction of Plant #2 in accordance with this permit.

Analyzer Specifications

The two analyzers shall meet the following specifications:

Table 1

Parameter	**Location**	**Range**
SO_2, mole fraction, dry basis	Stack	Dual range: Normal: 0 – 500 ppm SO_2 SSM: 0 – 3,600 ppm SO_2
SO_2, mole fraction, dry basis	Converter Inlet	Single range: 0 – 15 % SO_2
Volumetric flow rate, DSCFM	Stack	0 to 125% of the maximum expected volumetric flow rate

The stack SO_2 analyzer shall meet all applicable requirements of 40 CFR 60.11, 60.13, 40 CFR Part 60, Appendix B, Performance Standard 2, and the Quality Assurance and Quality Control Procedures in 40 CFR Part 60, Appendix F, Procedure 1.

The Converter Inlet SO_2 analyzer likewise shall meet all applicable requirements of 40 CFR Part 60, Appendix B, Performance Specification 2, and 40 CFR Part 60, Appendix F, Procedure 1, except as follows:

- The Permittee shall select the optimum location to obtain representative SO_2 readings. Turbulence near the blower exit and/or elevated temperatures at the converter inlet may require an analyzer measurement location that differs from the requirements of Performance Specification 2, Section 8.1.

- In lieu of annual Relative Accuracy Test Audits (RATAs), as described in Section 5.1.1 of Appendix F, the Permittee shall conduct quarterly cylinder gas audits (i.e., four per year) on the converter inlet SO_2 analyzer.

The volumetric flow rate analyzer will meet 40 CFR Part 60, Appendix B, Performance Specification 6 and the Quality Assurance and Quality Control Procedures in 40 CFR Part 60, Appendix F, Procedure 1.