Rule 2011 - Protocol for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO\textsubscript{X}) Emissions
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview</td>
<td>2011A-1-1</td>
</tr>
<tr>
<td>2</td>
<td>Major Sources - Continuous Emission Monitoring System (CEMS)</td>
<td>2011A-2-1</td>
</tr>
<tr>
<td>3</td>
<td>Process Units - Periodic Reporting (CPMS) and Rule 219 Equipment</td>
<td>2011A-3-1</td>
</tr>
<tr>
<td>4</td>
<td>Process Units - Source Testing</td>
<td>2011A-4-1</td>
</tr>
<tr>
<td>5</td>
<td>Remote Terminal Unit (RTU) - Electronic Reporting</td>
<td>2011A-5-1</td>
</tr>
<tr>
<td>6</td>
<td>Reference Methods</td>
<td>2011A-6-1</td>
</tr>
</tbody>
</table>

Attachment A - 1N Procedure
Attachment B - Bias Test
Attachment C - Quality Assurance and Quality Control Procedures
Attachment D - List of Acronyms and Abbreviations
Attachment E - Definitions
Attachment F - Supplemental and Alternative CEMS Performance Requirements for Low SOx Concentrations
Main Chart for SOx

1. RECLAIM FACILITY
   - Go To
   - Major Source?
     - Yes
       - [Rule 2011c.1, Protocol Tbl 1A]
       - Major Chart for SOx
     - No
       - Process Unit?
         - Yes
           - [Rule 2011 (d)(1)]
           - Process Unit Chart for SOx
         - No
           - Rule 219
             - [Rule 219]
             - Yes
               - Chapter 3, Subdiv. F of SOx Protocol
             - No
               - SO\textsubscript{2} MRR Requirements Not Applicable

2. Compliance Chart
Major Chart for SOx

From Main Chart for SOx

Interim Reporting?
[Rule 2011(f)]

Yes

Submit Interim Reporting Data
[Ch. 3, Eq. 14]

Calculation/Monitoring Requirement
[Ch. 2.B. 1-3]

RTU Requirement
[Ch. 5]

Certification Requirements
[Ch. 2.b. 4-18]

Timesharing Requirements, if any
[Ch. 2.F.]

Measurement Requirements
[Ch. 2.A., Tbl. 2A]

(Calculator/Monitoring)

Ready

Missing Data Procedures
[Ch. 2.E.]

(Optional)

Alternate Procedure for Stack Flow
[Ch. 2.D.]

(Optional)

Report Daily Emissions
[Ch. 2.C.2a. & Ch. 2.B.3.]

Go To

Compliance Chart

No
Process Chart For SOx

From Main Chart for SOx

MRR Requirements
[Ch. 3.A.]

Install Totalizing Fuel Meter, or Timer or other appropriate device.

(Optional)

Fuel Meter Sharing
[Ch. 3.E.]

(Optional)

Maint. Emission Fac or Elect for Alter. Em Fac.?

(Alternative Emission Factor)

(Emission Factor)

Yes

No

Established Alt Em Factor
[Ch. 4.E.]

Calculate Qtly Mass Emissions
[Ch 3.B.2. & 3.C]

Go to Report Quarterly Emissions [Ch 3.D., Tbl 3B]

Go to Compliance Chart

Protocol, Rule 2011
May 6, 2005
Compliance Chart For SOx

Major Chart

↓

Daily Reported SOx (lb/day)

↓

Monthly Reported SOx (lb/month) [Ch. 2.C.2.b]

↓

Accumulate monthly to Annual SOx Emissions (lb/year)

↓

Accumulate to Annual SOx Emissions (lb/year)

↓

Are Emissions Greater than RTCs?

Yes ↓

In Violation

No ↓

In Compliance

Process Unit Chart

↓

Quarterly Reported SOx (lb/qtr)

↓

Accumulate to Annual SOx Emissions (lb/year)

219 Exempt Equipment

↓

Quarterly Reported SOx (lb/qtr)

↓

Accumulate to Annual SOx Emissions (lb/year)
SOx Timeline Chart For Plan, Certification And Installation

By 12/31/93
For Cycle 1, Submit MRR Plan. Install Fuel Meter or other appropriate device.

By 3/31/94
For Cycle 1, Submit CEMS Plan

By 6/30/94
For Cycle 2, Submit MRR Plan. Install Fuel Meter or other appropriate device.

By 9/30/94
For Cycle 2, Submit CEMS Plan.

By 12/31/94
For Cycle 1, Install Certified Meter or other Plan or other CEMS and RTU appropriate device.

By 6/30/95
For Cycle 2, Install Certified Meter or other CEMS and RTU device.

For Cycle 1, Submit MRR Plan. Install Fuel Meter or other appropriate device.

For Cycle 2, Submit MRR Plan. Install Fuel Meter or other appropriate device.

For Cycle 1, Install Electronic Reporting System

For Cycle 2, Install Electronic Reporting System
Timeline for SOx Emission Reporting

Cycle 1 Facilities
- Interim Reporting Starts
- Starting 1/1/94
- Final Reporting Starts

Cycle 2 Facilities
- Interim Reporting Starts
- Starting 7/1/94
- Final Reporting Starts
- Starting 7/1/95

SOx Central Station

Note 1: The Facility Permit Holder shall submit a variance to the hearing board, if any of the deadlines are not met.

Note 2: Refer to Chapter 6 of SOx Protocol for remedial actions required when the loss of categorization status occurs.
R U L E  2 0 1 1  P R O T O C O L -  
C H A P T E R  1  

O V E R V I E W
This document provides the technical specifications for normally operated RECLAIM sources subject to District Rule 2011 "Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO\textsubscript{x}) Emissions". District Rule 2011 divides sources into three categories - major sources, SO\textsubscript{x} process units and Rule 219 - "Equipment Not Requiring a Written Permit Pursuant to Regulation II" sources. The one difference in requirements between these source categories is the monitoring approach. A major source shall be monitored by a continuous emissions monitoring system (CEMS) or alternative monitoring system, while a SO\textsubscript{x} process unit has the option to be monitored manually based on fuel usage and emission factor.

Oxides of sulfur (SO\textsubscript{x}) emissions shall be composed of sulfur dioxide (SO\textsubscript{2}) emissions. No later than June 30, 1994 the Executive Officer will determine the feasibility for estimating sulfur trioxide (SO\textsubscript{3}) emissions as a function of SO\textsubscript{2} emissions for a petroleum refinery fluid catalytic cracking unit. If the Executive Officer determines that the surrogate approach is feasible then a unit-specific protocol will be developed by the Executive Officer by August 31, 1994. The Facility Permit holder of a petroleum refinery fluid catalytic cracking unit shall apply the protocol prospectively to determine SO\textsubscript{x} emissions on both SO\textsubscript{2} and SO\textsubscript{3} emissions. If the Executive Officer determines that the surrogate approach is not feasible then SO\textsubscript{x} emissions shall continue to be based only on SO\textsubscript{2} emissions.

These SO\textsubscript{x} source categories also differ in the way in which they transmit data to the District's Central Station and the reporting frequency. Major sources shall electronically transmit the data via an RTU on a daily basis. In addition, aggregated SO\textsubscript{x} emissions from all major sources must be submitted in a Monthly Emissions Report. SO\textsubscript{x} process units have the option to report SO\textsubscript{x} emissions as part of the Quarterly Certification of Emissions required by Rule 2004 - Requirements.

The criteria for determining the major source applicability is presented in Table 1-A. A SO\textsubscript{x} process unit is one or more piece(s) of equipment which is not a major source, provided that each equipment in a process unit is subject to an identical emission factor specified in subdivision (d) of Rule 2011.

The Facility Permit will limit mass emissions in accordance with the following relationship:

\[ \sum E_{\text{CEMS}} + \sum E_{\text{EF}} + \sum E_{219} \leq \text{RTC} \]

where:

- \( \sum E_{\text{CEMS}} \) = sum of facility emissions monitored by CEMS or alternative monitoring system
- \( \sum E_{\text{EF}} \) = sum of facility emissions from process units subject to emission factors (EF\textsubscript{pu})
- \( \sum E_{219} \) = sum of facility emissions from equipment exempt under Rule 219, subject to emission factor (EF\textsubscript{219})
- RTC = RECLAIM Trading Credit held by the Facility Permit holder
The fuel usage for any process unit or equipment exempt under Rule 219 shall not exceed the value determined in accordance with the following relationship:

\[ \sum (FxEF)_{pu} + \sum (FxEF)_{219} < RTC - \sum E_{CEMS} \]

where:

\[ F = \text{Fuel usage for the process unit or equipment exempt under Rule 219} \]

The Facility Permit holder shall document the duration of operating time of any rental equipment or equipment operated by a contractor at the RECLAIM facility. Emissions generated at the RECLAIM facility by either rental equipment or equipment not listed or required to be listed under the Facility Permit and operated by a contractor, which exceeds 72 hours of operation in a quarter, shall be determined and reported by the Facility Permit holder according to the applicable methodology specified for each major source or process unit or Rule 219 exempt equipment.

The duration of operating time and emissions from equipment operated by contractors need not be monitored or reported if the equipment is exclusively used for the following purposes that do not contribute to the manufacturing process:

- Landscaping and grounds maintenance;
- Maintenance and repair of structure, equipment, and their appurtenances;
- Construction and demolition; or
- Environmental investigation, testing, and remediation.

A Facility Permit holder subject to the requirements of Rules 2005(b)(2) and 2005(f) shall monitor and report applicable emissions as specified in Rule 2005(b)(2)(C). The emissions from these activities shall be determined according to the methodology specified for process units.

Emissions resulting from equipment during breakdowns shall be quantified in a manner specified by the Executive Officer in accordance with the following criteria:

1. When emissions are within the valid monitoring range of the monitor, the emissions shall be calculated based on the methodology pursuant to Chapters 2 and 3.

2. When emissions exceed the valid monitoring range of the monitor, the emissions may be calculated based on any one or more of the following:
   - Source test data
   - Fuel flow or throughput
   - Sulfur content of fuel during the breakdown period
   - Emission factor
   - Control efficiencies
   - Any other relevant data that may be used to determine emissions during breakdown.
This document has been divided into chapters addressing the various compliance aspects of Rule 2011. A summary of each chapter follows:

CHAPTER 2: MAJOR SOURCES - CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)

Chapter 2 describes the methodologies for measuring and reporting \( \text{SO}_x \) emissions from major sources. If a major source category is applicable, then the Facility Permit holder shall be required to comply with the performance standards associated with a CEMS or an equivalent monitoring device.

For major sources, measurement and reporting requirements apply to variables used to calculate the \( \text{SO}_x \) emissions as well as the variables used to track the operation of basic, control, and monitoring equipment.

Unless specifically exempted by Rule 2011, the Facility Permit holder shall measure and record all applicable variables as specified in Table 2-A.

Several important aspects of Chapter 2 include:

• equations describing the method used to calculate \( \text{SO}_x \) emissions,
• operational requirements,
• obtaining valid data points,
• alternative data acquisition methods,
• accuracy requirements,
• quality assurance procedures,
• missing data procedures,
• final and interim reporting procedures, and
• timesharing

CHAPTER 3: PROCESS UNITS - PERIODIC REPORTING AND RULE 219 EQUIPMENT

Chapter 3 describes the measuring and reporting requirements for the \( \text{SO}_x \) process unit category and equipment exempt from permit under Rule 219. \( \text{SO}_x \) process units which comprise of one or more pieces of equipment in accordance with Rule 2011 shall base emission calculations primarily on fuel consumption or operating time in conjunction with the emission factor. The requirements and procedures for an emission factor and election conditions for an alternative emission factor shall apply to process units. These \( \text{SO}_x \) process units may include equipment that are lumped together only if the units have the same emission factor.

Important aspects of Chapters 3 include equations describing the method used to calculate \( \text{SO}_x \) emissions and reporting procedures for process units as well as determining \( \text{SO}_x \) emissions from equipment exempt under Rule 219.
CHAPTER 4: PROCESS UNITS - SOURCE TESTING

This Chapter presents a brief description of the required test methods for determining alternative emission factors for process units.

CHAPTER 5: REMOTE TERMINAL UNITS - ELECTRONIC REPORTING

Once the variables for determining emissions and equipment operations have been measured, the measured data would be stored at the facility. In addition, selected measured and calculated data would be transmitted to the District's Central Station Computer. This storing and transmitting of data for major sources shall be performed by the remote terminal unit (RTU).

Chapter 5 specifies tasks and characteristics required of the RTU as well as a guide for providing the required software/hardware for the RTU. In addition, this chapter serves as a:

- functional guideline for operating requirements of the RTU, and
- information source concerning RTU hardware/software procurement, configuration, installation, maintenance, and compatibility with the CEMS and the District's Central Station.
TABLE 1-A
Criteria for Determining Major SO\textsubscript{x} Source Category

- Any petroleum refinery fluid catalytic cracking units;
- Any tail gas unit;
- Any sulfuric acid production unit;
- Any equipment that burns refinery, landfill, and sewage digester gaseous fuels, except gas flare;
- Any existing equipment using SO\textsubscript{x} CEMS, or equivalent monitoring device, or required to install such monitoring device under District rules to be implemented as of October 15, 1993
- Any SO\textsubscript{x} source or process unit elected by the Facility Permit holder or required to be monitored with a CEMS, or equivalent monitoring device; and
- Any SO\textsubscript{x} source or process unit for which SO\textsubscript{x} emissions reported pursuant to Rule 301 were equal to or greater than 10 tons/yr for any calendar year from 1987 to 1991, inclusive, excluding any SO\textsubscript{x} source or process unit which has reduced SO\textsubscript{x} emissions to below 10 tons per year to January 1, 1994.