



AIR QUALITY PROGRAM
301 39th Street, Bldg. #7
Pittsburgh, PA 15201-1811


Federally Enforceable Installation Permit
For 1-Hour SO₂ NAAQS

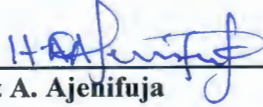
Issued To: U. S. Steel Mon Valley Works
Clairton Plant
400 State Street
Clairton, PA 15025-1855

ACHD Permit#: 0052-1017

Date of Issuance: September 14, 2017

Expiration Date: (See Section III.12)

Issued By: 
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II. FACILITY DESCRIPTION

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U. S. Steel Mon Valley Works Clairton Plant is the largest by-products coke plant in North America. The Clairton Plant operates 10 coke batteries and produces approximately 13,000 tons of coke per day from the destructive distillation (carbonization) of more than 18,000 tons of coal. During the carbonization process, approximately 225 million cubic feet of coke oven gas are produced. The volatile products of coal contained in the coke oven gas are recovered in the by-products plant. In addition to the coke oven gas, daily production of these by-products include 145,000 gallons of crude coal tar, 55,000 gallons of light oil, 35 tons of elemental sulfur, and 50 tons of anhydrous ammonia. The coke produced is used in the blast furnace operations in the production of molten iron for steel making.

INSTALLATION DESCRIPTION

As part of the attainment demonstration for sulfur dioxide (SO₂), U. S. Steel has agreed to reduced sulfur dioxide emission limits. These limits will be federally enforceable upon issuance of this permit and incorporated into the Allegheny County portion of the Pennsylvania State Implementation Plan (SIP). U. S. Steel has significantly decreased the H₂S in its coke oven gas through improvements to the desulfurization process that results in reduction of the hydrogen sulfide contained in coke oven gas burned in combustion units identified in this permit.

The emission units regulated by this permit are summarized in Table II-1:

TABLE II-1: Emission Unit Identification

I.D.	SOURCE DESCRIPTION	SO ₂ CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
B001	Boiler 1	NA	760 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
B002	Boiler 2	NA	481 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
B005	Boiler R1	NA	229 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
B006	Boiler R2	NA	229 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
B007	Boiler T1	NA	56 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
B008	Boiler T2	NA	156 MMBtu/hour	Coke Oven Gas and Natural Gas	NA
P001	Battery 1 (Underfiring)	NA	517,935 tons of coal charged per year	Coke Oven Gas and Natural Gas	S001
P002	Battery 2 (Underfiring)	NA	517,935 tons of coal charged per year	Coke Oven Gas and Natural Gas	S002

I.D.	SOURCE DESCRIPTION	SO ₂ CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
P003	Battery 3 (Underfiring)	NA	517,935 tons of coal charged per year	Coke Oven Gas and Natural Gas	S003
P007	Battery 13 (Underfiring)	NA	545,675 tons of coal charged per year	Coke Oven Gas and Natural Gas	S007
P008	Battery 14 (Underfiring)	NA	545,675 tons of coal charged per year	Coke Oven Gas and Natural Gas	S008
P009	Battery 15 (Underfiring)	NA	545,675 tons of coal charged per year	Coke Oven Gas and Natural Gas	S009
P010	Battery 19 (Underfiring)	NA	1,002,290 tons of coal charged per year	Coke Oven Gas and Natural Gas	S010
P011	Battery 20 (Underfiring)	NA	1,002,290 tons of coal charged per year	Coke Oven Gas and Natural Gas	S011
P012	B Battery (Underfiring)	NA	1,491,025 tons of coal charged per year	Coke Oven Gas and Natural Gas	S012
P046	C Battery (Underfiring)	NA	1,379,059 tons of coal charged/year	Coke Oven Gas and Natural Gas	S046
P013	Quench Tower 1	NA	1,553,805 tons of coal per year	Incandescent coke and water	NA
P017	Quench Tower B	NA	1,491,025 tons of coal per year	Incandescent coke and water	NA
P047	Quench Tower C	NA	1,379,059 tons of coal per year	Incandescent coke and water	NA
P015A	Quench Tower 5A	NA	1,270,200 tons of coke per year	Incandescent coke and water	NA
P016A	Quench Tower 7A	NA	1,555,630 tons of coke per year	Incandescent coke and water	NA

Department upon request for inspection and copying.

25. SO₂ Compliance Monitoring

- a. The permittee shall not operate, or allow to be operated, any source in such manner that unburned coke oven gas is emitted into the open air. In addition, the permittee shall not flare, mix, or combust coke oven gas, or allow such gas to be flared, mixed or combusted unless the concentration of sulfur compounds, measured as hydrogen sulfide, in such gas is less than or equal to 35 grains per hundred dry standard cubic feet of coke oven gas produced by Clairton Plant, when all sulfur emissions from the Claus Sulfur Recovery Plant and the tail gas cleaning equipment thereon, expressed as equivalent H₂S are added to the measured H₂S. The concentration of sulfur compounds specified shall include the tail-gas sulfur, measured as hydrogen sulfide, emitted from sulfur removal equipment. [§2105.21.h].
- b. For sources listed in Table V-A-1, the permittee shall determine the H₂S grain loading and flow rate of the fuel as combusted. The permittee shall record the output of each system for measuring sulfur dioxide emissions discharged to the atmosphere.

26. SO₂ Compliance

The restrictions and requirements in Sections V.A and 0 will become effective on or before October 4, 2018.

V. EMISSION UNIT LEVEL TERMS AND CONDITIONS

A. SO₂ Limits – Boilers and Coke Oven Battery Underfire Stacks

1. Restrictions:

- a. The combustion units listed in Table V-A-1 shall only combust natural gas and coke oven gas. (§2102.04.b.6)
- b. SO₂ emissions from the following sources shall not exceed the limitations in Table V-A-1 below: [§2102.04.b.6, §2105.21.h]

TABLE V-A-1. SO₂ Emission Limitations

Process	Thirty-day (30-day) Emission Limit* (lb/hr)	Supplementary 24-hr Limit** (lb/hr)
Boiler 1	118.44***	134.06***
Boiler 2		
Boiler R1		
Boiler R2		
Boiler T1		
Boiler T2		
Battery 1 Underfiring	10.41	13.27
Battery 2 Underfiring	9.15	11.66
Battery 3 Underfiring	10.57	13.47
Battery 13 Underfiring	13.93	15.70
Battery 14 Underfiring	14.03	15.80
Battery 15 Underfiring	18.67	21.04
Battery 19 Underfiring	29.37	33.09
Battery 20 Underfiring	27.00	30.42
B Battery Underfiring	21.38	27.26
C Battery Underfiring	32.03	40.83

* Limits are based on a rolling 30-day average of 24-hour (calendar day) averages.

** Supplementary 24-hour limit is not to be exceeded more than 3 times consecutively (over any consecutive 3 calendar day period).

*** Emission limits are on an aggregate basis.

2. Testing Requirements:

- a. The permittee shall have sulfur dioxide (SO₂) emissions stack tests performed on the boiler stacks and battery underfire stacks at least once every two years as required by Article XXI §2108.02.b. SO₂ emission tests shall be conducted according to Method 6, 6A, 6B, or 6C as specified in 40 CFR 60, Appendix A. The permittee shall submit a stack test protocol to the Department for approval at least 45 days prior to the test date(s). [§2108.02.b and §2108.02.e]
- b. Emissions of SO₂ shall be determined by converting the H₂S grain loading of the fuel burned and the fuel flow rate to pounds per hour to determine compliance with the emission limitations of Table V-A-1 above. [§2103.12.h.1]
- c. The Department reserves the right to require emissions testing; sufficient to assure compliance with the terms and conditions of this permit. Such testing shall be performed in accordance with §2108.02. [§2103.12.h.1]

3. Monitoring Requirements:

- a. Except for monitor malfunctions, , associated repairs, and required quality assurance or control activities (including as applicable, calibration checks and required zero and span adjustments), the permittee shall continuously monitor and record the H₂S concentration (in grains(gr)/100 dscf) of the COG combusted and the fuel flow rate required in Site Level Condition IV.25.b. Continuously shall be defined as at least once every 15 minutes. [§2102.04.b.6; §2103.12.i]
- b. Monitoring of the H₂S concentration of the COG shall meet the requirements of 90% data availability . [§2102.04.b.6; §2103.12.i]
- c. On or before March 31, 2018, the permittee shall propose, for Department approval, a procedure for measuring the H₂S content of the gas during periods of monitoring malfunction or breakdowns. [§2102.04.b.6; §2103.12.i]

4. Record Keeping Requirements:

- a. The permittee shall keep records of hourly fuel use (COG and natural gas) and hourly H₂S concentration in grains per 100 dscf. [§2103.12.j]
- b. The permittee shall record all instances of non-compliance with the conditions of this permit upon occurrence along with corrective action taken to restore compliance. [§2102.04.b.6]
- c. All records shall be retained by the facility for at least five (5) years. These records shall be made available to the Department upon request for inspection and/or copying. [§2102.04.b.6]

5. Reporting Requirements:

- a. The permittee shall report the concentration of H₂S per 100 dscf of COG averaged over a calendar day to the Department on a quarterly basis, in accordance with General Condition III.15.e. All instances of non-compliance with the conditions of this permit along with all corrective action taken to restore the subject equipment to compliance shall be reported. [§2103.12.k]

- b. Reporting instances of non-compliance in accordance with condition V.A.5.a above, does not relieve the permittee of the requirement to report breakdowns in accordance with Site Level Condition IV.8, if appropriate. (§2103.12.k)
- c. Reporting instances of non-compliance does not relieve the permittee of the requirement to report breakdowns in accordance with Site Level Condition IV.8, if appropriate. (§2103.12.k)

6. Work Practice Standards:

None except as provided elsewhere.

7. Additional Requirements:

None except as otherwise provided.

B. SO₂ Limits – PEC Baghouses, SCOT Stack, Quench Towers, and Hot Cars**1. Restrictions:**

- a. During planned outages of the SCOT Plant, the permittee shall re-route the Claus Plant tail gas to the battery suction main. [§2102.04.b.6]
- b. In the event of an unplanned SCOT Plant outage, the Claus Plant tail gas shall be re-routed to the battery suction main as soon as practicable. [§2102.04.b.6]
- c. SO₂ emissions from the following sources shall not exceed the limitations in Table V-B-1 below: [§2102.04.b.6, §2105.21.h.4]

TABLE V-B-1: SO₂ Emission Limitations

POLLUTANT	SO₂ Emission Limit (lb/hr)
PEC Baghouse 1-3	7.10
PEC Baghouse 13-15	7.46
PEC Baghouse 19-20	7.78
PEC Baghouse B	7.50
PEC Baghouse C	8.65
SCOT Stack	24.00
Quench Tower 1	0.75
Quench Tower B	4.09
Quench Tower C	5.00
Quench Tower 5A	7.56
Quench Tower 7A	7.21
Batteries 1-3 Hot Car	10.64
Batteries 13-15 Hot Car	11.21
Batteries 19-20 Hot Car	13.73
C Battery Hot Car	5.82

2. Testing Requirements:

- a. The permittee shall perform or cause to be performed baghouse emission stack tests for SO₂ at least once every two years in accordance with approved EPA methods and performed according to §2108.02 of Article XXI. [§2108.02]
- b. The permittee shall have SCOT Plant emission stack tests for SO₂ conducted at least once every two years in accordance with approved EPA methods and performed according to §2108.02 of Article XXI. [§2108.02]

- c. The Department reserves the right to require additional emissions testing sufficient to assure compliance with the terms and conditions of this permit. Such testing shall be performed in accordance with §2108.02. [§2103.12.h.1]

3. Monitoring Requirements:

- a. The permittee shall monitor and record the online (operating) hours of the SCOT Plant. [§2103.12.i]
- b. The permittee shall record the number of pushes per day and the amount of coal charged daily for each Battery Unit. [§2103.12.i]

4. Record Keeping Requirements:

- a. The permittee shall record all instances of non-compliance with the conditions of this permit upon occurrence along with corrective action taken to restore compliance. [§2102.04.b.6; §2103.12.j]
- b. The permittee shall maintain monthly records of all monitoring required per Condition V.B.3 for at least five (5) years. These records shall be made available to the Department upon request for inspection and/or copying. [§2102.04.b.6; §2103.12.j.2]

5. Reporting Requirements:

- a. The permittee shall report to the Department quarterly, in accordance with General Condition III.15.e, all instances of non-compliance with the conditions of this permit along with all corrective action taken to restore the subject equipment to compliance. [§2103.12.k]
- b. Reporting instances of non-compliance in accordance with condition V.A.5.a above, does not relieve the permittee of the requirement to report breakdowns in accordance with Site Level Condition IV.8, if appropriate. [§2103.12.k]

6. Work Practice Standards:

None except as provided elsewhere.

7. Additional Requirements:

None except as otherwise provided.