



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUN 29 2012

REPLY TO THE ATTENTION OF:

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mark Darby
Environmental Manager
Calumet Superior, LLC
2407 Stinson Avenue
Superior, Wisconsin 54880

Re: Finding of Violation and Notice of Violation

Dear Mr. Darby:

This is to advise you that the U.S. Environmental Protection Agency has determined that Calumet Superior, LLC (Calumet) is in violation of the Clean Air Act (CAA) because of the way it has operated flares at its Superior, Wisconsin facility. Specifically, Calumet has added more steam to its flares than is acceptable under good pollution control practices and has failed to meet prescribed net heating values. A Notice of Violation and Finding of Violation (NOV/FOV) for these violations is being issued and is enclosed for your review.

The standards EPA is applying to Calumet come from two sets of federal regulations: National Emission Standards for Hazardous Air Pollutants (NESHAP), found in 40 Code of Federal Regulations (C.F.R.) Part 63; and New Source Performance Standards (NSPS), found in 40 C.F.R. Part 60. Both NESHAP and NSPS include standards formulated for specific source categories. Because Calumet is a petroleum refinery, the applicable NESHAP are found in 40 C.F.R. Part 63, Subpart CC, while the applicable NSPS are found in 40 C.F.R. Part 60, Subpart J. Besides prescribing source-specific standards, these regulations require compliance with general provisions found in Subpart A of both Part 60 and Part 63. The purpose of these requirements is to reduce emissions that can compromise public health and welfare. Specifically, these requirements ensure that volatile organic compounds and hazardous air pollutants are controlled to reduce potential harm to the human respiratory system and to reduce the risk of cancer.

EPA delegated to the Wisconsin Department of Natural Resources the authority to issue federally-enforceable operating permits under Title V of the Clean Air Act, 42 U.S.C. §§ 7661 et seq. Calumet's Title V permit incorporates NESHAP Subpart CC. Consequently, Calumet's violations of the NESHAP standards are also violations of Calumet's Title V permit.

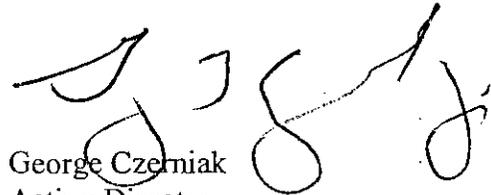
Section 113 of the CAA gives the EPA several enforcement options to resolve these violations, including: issuing an administrative compliance order, issuing an administrative penalty order,

and bringing a judicial civil action. The option we select, in part, depends on the efforts taken by Calumet to correct the alleged violations and the timeframe in which you can demonstrate and maintain continuous compliance with the requirements cited in the NOV/FOV.

We are offering you the opportunity to request a conference with us about the violations alleged in the NOV/FOV. A conference should be requested within 10 days following receipt of this notice. A conference should be held within 30 days following receipt of this notice. This conference will provide you a chance to present information on the identified violations, any efforts you have taken to comply and the steps you will take to prevent future violations. Please plan for your facility's technical and management personnel to take part in these discussions. You may have an attorney represent and accompany you at this conference.

The EPA contact in this matter is Gregory Gehrig. You may contact him at (312) 886-4434 or gehrig.greg@epa.gov if you wish to request a conference. The EPA hopes that this NOV/FOV will encourage Calumet to comply with the requirements of the Clean Air Act.

Sincerely,



George Czerniak
Acting Director
Air and Radiation Division

Enclosure

cc: Bill Baumann, Wisconsin Department of Natural Resources
Neal Baudhuin, Wisconsin Department of Natural Resources

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5**

IN THE MATTER OF:)
)
Calumet Superior, LLC)
Superior, Wisconsin) **NOTICE OF VIOLATION and**
) **FINDING OF VIOLATION**
)
Proceedings Pursuant to) **EPA-5-12-WI-6**
the Clean Air Act,)
42 U.S.C. §§ 7401 et seq.)

NOTICE AND FINDING OF VIOLATION

Calumet Superior, LLC (you or Calumet) owns and operates a petroleum refining facility at 2407 Stinson Road in Superior, Wisconsin. Calumet uses two steam-assisted flares at this facility. The EPA is sending you this Notice and Finding of Violation (NOV/FOV) for not properly operating these flares.

Regulatory and Statutory Authority

The NOV/FOV is based on the following regulations and permit conditions:

1. In 1995, EPA delegated to the Wisconsin Department of Natural Resources (WDNR) the authority to issue federally-enforceable operating permits under Title V of the Clean Air Act, 42 U.S.C. §§ 7661 *et seq.*, as part of the Wisconsin State Implementation Plan (Wisconsin SIP) (*See* 60 Fed. Reg. 3543, Jan. 18, 1995). The Wisconsin Title V permitting process is codified in Wisconsin Administrative Code (WAC) NR 406 and NR 407. Calumet was issued Title V Permit No. 816009590-P01 on December 20, 2004.
2. Calumet operates process units subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Petroleum Refineries (40 C.F.R. Part 63, Subpart CC) that vent to the facility's flares. NESHAP Subpart CC is incorporated into Calumet's Title V Permit in Part I, Section II.A.
3. NESHAP Subpart CC requires compliance with certain portions of the NESHAP General Provisions (40 C.F.R. Subpart A) as detailed in Table 6 of NESHAP Subpart CC.
4. Section 63.6(e)(1)(i) of NESHAP Subpart A (40 C.F.R. § 63.6(e)(1)(i)) requires air pollution control equipment to be operated in a manner consistent with good air pollution control practices.

5. Section 63.11(b) of NESHAP Subpart A (40 C.F.R. § 63.11(b)) provides control device and work practice standards for flares, including the requirement that flares be used “only with the net heating value [NHV] of the gas being combusted at 11.2 MJ/scm (300 BTU/scf) or greater if the flare is steam-assisted...” (40 C.F.R. § 63.11(b)(6)(ii)).
6. Calumet is subject to Standards of Performance for New Stationary Sources (NSPS) for Petroleum Refineries (40 C.F.R. Part 60, Subpart J), which require compliance with the NSPS General Provisions (40 C.F.R. Part 60, Subpart A).
7. Section 60.11(d) of NSPS Subpart A (40 C.F.R. § 60.11(d)) requires air pollution control equipment to be operated in a manner consistent with good air pollution control practices.
8. NSPS Subpart A codifies specific requirements for flares, including the requirement that flares “be used only with the net heating value [NHV] of the gas being combusted at 11.2 MJ/scm (300 BTU/scf) or greater if the flare is steam-assisted...” (40 C.F.R. § 60.18(c)(3)(ii)).

Explanation of Violations

9. Calumet uses two flares to control emissions from its refinery process. These flares are designated as the primary flare and the backup flare. The primary flare controls continuous emissions of minor leaks from most refinery process operations. It also controls unplanned emission events from these same process units. The backup flare is used only when the primary flare is not in operation while refinery process units are operating.
10. Both flares are steam-assisted, which means that steam is added to the waste, or vent gas stream, to enhance combustion and prevent the formation of smoke. Steam is added in proportion to the amount of vent gas. It is common practice to measure the amount of steam as a ratio of the mass of steam per unit mass of vent gas (lb/lb).
11. Published literature, flare test reports, and EPA documents explain the negative effects that steam can have on flares if applied in excessive amounts. The most prominent of these is a 1983 flare testing study funded jointly by the Chemical Manufacturers Association (CMA) and EPA, conducted by the flare manufacturer John Zink Company, and reported in both a March 1983 report issued by the CMA titled, “A Report on a Flare Efficiency Study,” and a July 1983 report issued by EPA titled, “Flare Efficiency Study.” EPA 600/2-83-052. The 1983 study included various tests to determine the efficiency of flares under a variety of operating conditions. The tests performed included a range of steam flows. The report’s authors indicated that excessive steam-to-vent gas ratios (lb steam per lb vent gas) likely caused steam quenching of the flare during the tests. In particular, the reports noted that of all the various operating conditions applied during the flare tests, the only runs where combustion fell significantly below 98% were during tests when high steam-to-vent gas ratios were applied. Based on these findings, EPA, in the abstract of its report, concludes that “under conditions representing good industrial practice,” combustion efficiencies at the sampling probe consistently were greater than 98%. Combustion efficiencies declined, however, “under conditions of excessive steam (steam quenching) and high exit velocities of low-Btu content gases.” The EPA report, at page 37, specifically states that the data

collected shows, “[G]eneral tendencies for combustion efficiencies to decline at higher or lower than normal steam flows. This data suggests that steam-to-relief gas ratios ranging from 0.4 to 1.5 yield the best combustion efficiencies.” Specifically, tests showed the following efficiencies at the following steam-to-vent gas (S/V) ratios:

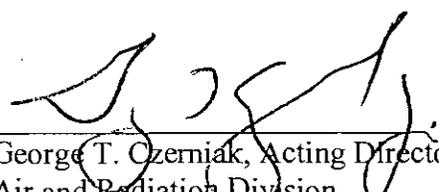
Pounds of Steam to One Pound of Vent Gas	Combustion Efficiency (%)
3.45	99.7
5.67	82.18
6.86	68.95

12. The EPA has identified other publicly available studies and EPA reports that evaluate how flare combustion efficiency is affected by steam addition. The conclusions of these studies support those of EPA 600/2-83-052. A list of some of these studies is included as an attachment to this NOV/FOV.
13. Operating information provided by Calumet in its CAA Section 114 response of March 20, 2012 indicates operation of the primary flare over a wide range of S/V ratios, from 0.02 to 13.08 from September 10, 2009 through January 29, 2012.
14. Operating information provided by Calumet in its CAA Section 114 response of March 20, 2012 indicates operation of the backup flare from May 7th through 14th, 2008 with an S/V ratio of 17.73 for 167 hours.
15. The failure of Calumet to operate in accordance with flare-specific or publicly available documents that set good industrial practice concerning the amount of steam to add to the flare, given the amount of waste gas, is a failure of the requirement to use good air pollution control practices to minimize emissions. This constitutes a violation of 40 C.F.R. § 63.6(e) and 60.11(d) and Calumet’s Title V permit.
16. Calumet provided NHV data for primary flare operations for the period of December 15, 2011 through January 29, 2012 in their CAA Section 114 response of March 20, 2012. These show that Calumet’s primary flare fell below a NHV of 300/BTU/scf for a total of 11 hours. This constitutes a violation of 40 C.F.R. § 63.11(b)(6)(ii) and 40 C.F.R. § 60.18(c)(3)(ii) and Calumet’s Title V permit.

Environmental Impact of Violations

- 17. These violations have caused or can cause excess emissions of volatile organic compounds (VOC). VOC emissions increase ground-level (tropospheric) ozone (smog). Ground-level ozone irritates lung airways and can cause wheezing, coughing, painful or difficult breathing, especially in people with respiratory problems. Repeated exposure can lead to more serious health problems like asthma, reduced lung capacity, and increased susceptibility to pneumonia or bronchitis. In addition, ground-level ozone inhibits the ability of plants to produce and store food, leading to ecological damage.

6/29/12
Date


George T. Ozerniak, Acting Director
Air and Radiation Division

Attachment

List of Documents Containing Flare Efficiency vs. Steam Addition Information

Chemical Manufacturer's Association and the United States Environmental Protection Agency. (July 1983) *Flare Efficiency Study* (EPA 600/2-83-052) Engineering-Science, Inc., Austin, Texas.

Texas Commission of Environmental Quality. (August 1, 2011) *TCEQ 2010 Flare Study Final Report* (Proposal for Grant Activities No. 582-8-862-45-FY09-04, Tracking No. 2008-81). The University of Texas, Austin, Texas.

Marathon Petroleum Company, LP, Texas City Refinery. (May 2010) *Performance Test of a Steam-Assisted Elevated Flare with Passive FTIR - Texas City*. Clean Air Engineering, Inc., Palatine, Illinois.

Marathon Petroleum Company, LP, Detroit Refinery. (November 23, 2010) *Performance Test of a Steam-Assisted Elevated Flare with Passive FTIR - Detroit*. Clean Air Engineering, Inc., Palatine, Illinois.

United States Environmental Protection Agency. (May 1984) *Evaluation of the Efficiency of Industrial Flares: Test Results*. Pohl, J.H.; Payne, R.; Lee, J. EPA , 600/2-84-095. Washington, D.C.

Chalmers University of Technology. (October 3, 2001) *Flare Testing using the SOF method at Borealis Polyethylene in the Summer of 2000*. Mellqvist, Johan. Chalmers University of Technology

The University of Texas at Austin. (October 10, 2005) *CFD (Computational Fluid Dynamics) for Simulation of Steam-Assisted and Air-Assisted Flare Combustion Systems*. Castineira, D.; Edgar, T. The University of Texas, Austin, Texas.

American Petroleum Institute. (March 1997) *Guide for Pressure-Relieving and Depressuring Systems*.

Note that this list is not intended to be a complete and comprehensive list of these studies.

CERTIFICATE OF MAILING

I, Loretta Shaffer, certify that I sent a Notice and Finding of Violation, No. EPA-5-12-WI-6, by Certified Mail, Return Receipt Requested, to:

Mark Darby
Environmental Manager
Calumet Superior, LLC
2407 Stinson Avenue
Superior, Wisconsin 54880

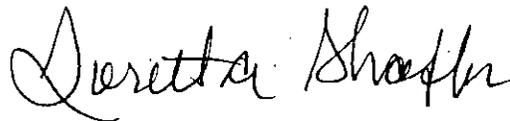
I also certify that I sent copies of the Finding of Violation and Notice of Violation by first class mail to:

Bill Baumann
Acting Director
Bureau of Air Management
Wisconsin Department of Natural Resources
101 S. Webster St.
PO Box 7921 (AM/7)
Madison, WI 53702

And

Neal Baudhuin
Supervisor - Compliance
Bureau of Air Management
Wisconsin Department of Natural Resources
107 Sutiff Ave.
Rhineland, WI 54501

on the 29 day of June, 2012.



CERTIFIED MAIL RECEIPT NUMBER: 7009 1680 0000 7672 9659