

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5**

In the Matter of:	)	
	)	
Knauf Insulation, Inc.	)	FINDING OF VIOLATION
Albion, Michigan	)	
	)	EPA-5-24-MI-09
Proceedings Pursuant to	)	
the Clean Air Act,	)	
42 U.S.C. §§ 7401 et seq.	)	

FINDING OF VIOLATION

The U.S. Environmental Protection Agency is issuing this Finding of Violation under Section 113(a)(3) of the Clean Air Act, 42 U.S.C. § 7413(a)(3). The U.S. Environmental Protection Agency finds that Knauf Insulation, Inc. (Knauf) is violating Section 111 of the Clean Air Act, 42 U.S.C. § 7411, and the Michigan Title V Renewable Operating Permit (ROP) Program. Specifically, Knauf is violating the Standard of Performance for Wool Fiberglass Insulation Manufacturing Plants at 40 C.F.R. Part 60, Subpart PPP (NSPS Subpart PPP) and the Facility's ROP as follows:

Regulatory Authority

NSPS Subpart PPP

1. On February 25, 1985, EPA promulgated NSPS Subpart PPP pursuant to Section 111 of the Clean Air Act, 50 Fed. Reg. 7699.
2. NSPS Subpart PPP applies to each rotary spin wool fiberglass manufacturing line. See 40 C.F.R. § 60.680(a).
3. Under 40 C.F.R. § 60.682, on and after the date on which the performance test required to be conducted by 40 C.F.R. § 60.8 is completed, no owner or operator subject to the provisions of NSPS Subpart PPP shall cause to be discharged into the atmosphere from any affected facility any gases which contain particulate matter in excess of 5.5 kg/Mg (11.0 lb/ton) of glass pulled.
4. Under 40 C.F.R. § 60.683(a), an owner or operator subject to the provisions of NSPS Subpart PPP who uses a wet scrubbing control device to comply with the mass emission standard shall install, calibrate, maintain, and operate monitoring devices that measure the gas pressure drop across each scrubber and the scrubbing liquid flow rate to each scrubber. The pressure drop monitor is to be certified by its manufacturer to be accurate within ± 250 pascals (± 1 inch water gauge) over its operating range, and the flow rate monitor is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range.
5. Under 40 C.F.R. § 60.683(b), an owner or operator subject to the provisions of NSPS Subpart PPP who uses a wet electrostatic precipitator control device to comply with the mass emission standard shall install, calibrate, maintain, and operate monitoring devices that measure the primary and secondary current (amperes) and voltage in each electrical field and the inlet water flow rate.

6. Under 40 C.F.R. § 60.683(c), all monitoring devices required by 40 C.F.R. § 60.683 are to be recalibrated quarterly in accordance with procedures under 40 C.F.R. § 60.13(b).

7. Under 40 C.F.R. § 60.684(d), each owner or operator shall submit written semiannual reports of exceedances of control device operating parameters required to be monitored by 40 C.F.R. § 60.684(a) and (b) and written documentation of, and a report of corrective maintenance required as a result of, quarterly calibrations of the monitoring devices required in 40 C.F.R. § 60.683(c). For the purpose of these reports, exceedances are defined as any monitoring data that are less than 70 percent of the lowest value or greater than 130 percent of the highest value of each operating parameter recorded during the most recent performance test (minimum and maximum limits).

8. The preamble to NSPS Subpart PPP states that if a wet control device (wet ESP or wet scrubber) is used by an owner or operator of an affected facility to meet the particulate emission limit, the standard would require measurement and recording of certain control device operating parameters to indicate when maintenance of the control device is required. 50 Fed. Reg. 7694 (Feb. 25, 1985).

Michigan Renewable Operating Permit

9. U.S. EPA promulgated full approval of Michigan's Title V ROP Program on December 4, 2001. Michigan's Title V program became effective on November 30, 2001. 66 Fed. Reg. 62949.

10. The Michigan Department of Environment, Great Lakes, and Energy (Michigan EGLE) has issued the following Title V operating permits to Knauf: MI-ROP-B7205-2015 with an effective date of June 3, 2015, and revised dates of October 9, 2015, and July 28, 2015, (the 2015 ROP) and MI-ROP-B7205-2021 with an effective date of September 3, 2021, and revised date of May 27, 2022 (the 2021 ROP).

Wool Fiberglass Manufacturing Lines

11. The 2015 ROP and the 2021 ROP (the ROPs) established conditions for three rotary spin wool fiberglass manufacturing lines known as EU-ML2ALBFORMING, EU-WBW1ALBFORMING, and EU-WBW2ALBFORMING; the 2021 ROP established conditions for an additional rotary spin wool fiberglass known as EU-WBW3ALBFORMING.

12. EU-ML2ALBFORMING is a part of the flexible group (FG) FG-ML2ALB in the ROPs.

13. EU-WBW1ALBFORMING and EU-WBW2ALBFORMING are grouped as EU-WBWALBFORMING in the 2015 ROP and FG-WBWALBFORMING in the 2021 ROP.

14. Condition FG-ML2ALB.IV.1 of the ROPs provides that Knauf shall not operate FG-ML2ALB unless the four wet scrubber control systems are installed, maintained, and operated in a satisfactory manner. Satisfactory operation of each high efficiency wet scrubber control systems is demonstrated by maintaining pressure drop, and scrubber liquid flow rate within 70 percent or more of the lowest value and 130 percent or less of the highest value of each monitored operating parameter recorded during the most recent acceptable stack test.

15. Condition EU-WBWALBFORMING.IV.1 of the 2015 ROP states that Knauf shall operate EU-WBWALBFORMING in conjunction with the wet scrubber control system being installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the wet scrubber control system is demonstrated by maintaining pressure drop, and liquid flow rate within 70 percent or more of the lowest value and 130 percent or less of the highest value of each monitored operating parameter recorded during the most recent applicable performance test.

16. Condition FG-WBWALBFORMING.IV.1 of the 2021 ROP states that Knauf shall not operate FG-WBWALBFORMING unless the associated wet scrubber control system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of each wet scrubber control system is demonstrated by maintaining pressure drop, and scrubber liquid flow rate within 70 percent or more of the lowest value and 130 percent or less of the highest value of each monitored operating parameter recorded during the most recent acceptable stack test.

17. Condition EU-WBW3ALBFORMING.IV.1. of the 2021 ROP states that Knauf shall not operate EU-WBW3ALBFORMING unless the wet scrubber control systems are installed, maintained, and operated in a satisfactory manner. Satisfactory operation of each wet scrubber control system is demonstrated by maintaining the pressure drop and liquid flow rate within 70 percent or more of the lowest value and 130 percent or less of the highest value of each monitored operating parameter recorded during the most recent applicable performance test.

18. Condition EU-WBW3ALBFORMING.IV.3. of the 2021 ROP states that Knauf shall not operate EU-WBW3ALBFORMING unless the wet electrostatic precipitator (WEP) control system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the wet electrostatic precipitator control system is demonstrated by maintaining the primary and secondary current and voltage in each electrical field and the inlet water flow rate within 70 percent or more of the lowest value and 130 percent or less of the highest value of each monitored operating parameter recorded during the most recent applicable performance test.

19. Condition FG-ML2ALB.III.1. of the ROPs states that the permittee shall not pull more than 108.0 tons of glass in FG-ML2ALB per calendar day (ML2ALB pull rate limit).

Glass Furnaces

20. The ROPs established conditions for four furnaces known as EU-FURNACE#1, EU-FURNACE#2, EU-FURNACE#3, and EU-FURNACE#4 (the furnaces).

21. EU-FURNACE#1, EU-FURNACE#3, and EU-FURNACE#4 are grouped as FG-FURNACE1,3 and 4 in the ROPs.

22. Condition FG-FURNACE1,3, and 4.IV.1 and EU-FURNACE#2.IV.1 of the ROPs states that the permittee is to operate the furnaces in conjunction with the baghouse controls being installed, maintained, and operated in a satisfactory manner. Satisfactory operation is defined as operation that does not result in the triggering of the bag leak detection system alarm.

23. Condition FG-FURNACE1,3, and 4.I.2. of the ROPs provides that the PM₁₀ emissions limit is 2.08 pounds per hour.

24. Condition FG-FURNACE1,3, and 4.VI.2.a. and Condition EU-FURNACE#2.VI.3.b of the ROPs provides that the Facility is to keep a log of bag leak detection system alarms (BLDS alarm log). The log shall identify the control device and include the date of the alarm; when the corrective actions were initiated; the cause of the alarm; an explanation of the corrective actions; and when the cause was corrected. For alarm events greater than 2-hours in duration, an estimate of the quantity of PM₁₀ emissions released.

25. Condition EU-FURANCE#2.VI.2 and Condition FG-FURNACE1,3, and 4.VI.1 of the ROPs provides that Knauf shall install, calibrate, maintain, and continuously operate in a satisfactory manner a baghouse leak detection (i.e., breakthrough) monitor and recorder for the furnaces.

Factual Background

26. Knauf owns and operates a rotary spin wool fiberglass insulation manufacturing facility at 1000 E. North Street, Albion, Michigan (the Facility).

27. Knauf operates four rotary spin wool fiberglass insulation manufacturing processes known as EU-WBW1ALBFORMING, EU-WBW2ALBFORMING, EU-WBW3ALBFORMING and EU-ML2ALBFORMING that are subject to the requirements of NSPS Subpart PPP (wool fiberglass manufacturing lines).

28. On April 26, 2023, EPA conducted an inspection of the Facility (the Inspection).

29. On November 15, 2023, EPA issued a Section 114 request for information to Knauf (the November Information Request).

30. Knauf provided its response to the November Information Request on December 14, 2023, and January 16, 2024 (response to the November Information Request).

31. On February 24, 2024, EPA requested additional information about Knauf's response to the November Information Request (the February Information Request).

32. On March 8, 2024, Knauf provided its response to the February Information Request (response to the February Information Request).

Wool Fiberglass Manufacturing Lines – Parameter Deviations

EU-ML2ALBFORMING

33. In its response to the November Information Request, Knauf provided records of continuous monitoring data, taken every 15 minutes, of the differential pressure and water flow rate for three forming scrubbers (Forming Scrubber #1, Forming Scrubber #2, and Forming Scrubber #3) and one cooling scrubber (Cooling Scrubber) operated at EU-ML2ALBFORMING (the ML2 scrubbers).

34. In its response to the November Information Request, Knauf provided the differential pressure and water flow rate minimum and maximum limits for Forming Scrubber #1, Forming Scrubber #2, Forming Scrubber #3, and the Cooling Scrubber based on the most recent stack test at EU-ML2ALBFORMING.

35. In its response to the February Information Request, Knauf provided the dates and time that EU-ML2ALBFORMING was not in operation.

36. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for Forming Scrubber #1 from January 10, 2019, to November 6, 2023, on 2,571 occasions.

37. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for Forming Scrubber #1 from January 10, 2019, to November 10, 2023, on 2,354 occasions.

38. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for Forming Scrubber #2 from January 5, 2019, to November 10, 2023, on 2,764 occasions.

39. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for Forming Scrubber #2 from January 10, 2019, to November 10, 2023, on 2,551 occasions.

40. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for Forming Scrubber #3 from January 4, 2019, to November 12, 2023, on 4,160 occasions.

41. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for Forming Scrubber #3 from January 10, 2019, to November 10, 2023, on 2,435 occasions.

42. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for the Cooling Scrubber from January 10, 2019, to November 10, 2023, on 3,741 occasions.

43. Based on its review of the information in paragraphs 33-35, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for the Cooling Scrubber from January 10, 2019, to November 10, 2023, on 2,925 occasions.

EU-WBW1ALBFORMING and EU-WBW2ALBFORMING

44. In its response to the November Information Request, Knauf provided records of continuous monitoring data, taken every 15 minutes, of the differential pressure and water flow rate for four forming scrubbers (East Forming Scrubber #1A, East Forming Scrubber #1B, West Forming Scrubber #1C, and West Forming Scrubber #2) operated at EU-WBW1ALBFORMING and EU-WBW2ALBFORMING (the WBW scrubbers).

45. In its response to the November Information Request, Knauf provided the differential pressure and water flow rate minimum and maximum limits for East Forming Scrubber #1A, East Forming Scrubber #1B, West Forming Scrubber #1C, and the West Forming Scrubber #2 based on the most recent stack test at EU-WBW1ALBFORMING and EU-WBW2ALBFORMING.

46. In its response to the February Information Request, Knauf provided the dates and time that EU-WBW1ALBFORMING and EU-WBW2ALBFORMING was not in operation.

47. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for East Forming Scrubber #1A from January 6, 2019, to November 13, 2023, on 11,043 occasions.

48. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for East Forming Scrubber #1A from January 7, 2019, to November 14, 2023, on 8,935 occasions.

49. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for East Forming Scrubber #1B from January 6, 2019, to November 13, 2023, on 11,349 occasions.

50. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for East Forming Scrubber #1B from January 7, 2019, to November 14, 2023, on 9,572 occasions.

51. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for West Forming Scrubber #1C from January 7, 2019, to November 11, 2023, on 6,738 occasions.

52. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for West Forming Scrubber #1C from January 11, 2019, to November 14, 2023, on 4,597 occasions.

53. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for West Forming Scrubber #2 from January 4, 2019, to November 14, 2023, on 6,552 occasions.

54. Based on its review of the information in paragraphs 44-46, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for West Forming Scrubber #2 from January 7, 2019, to November 14, 2023, on 5,033 occasions.

EU-WBW3ALBFORMING

55. In its response to the November Information Request, Knauf provided records of continuous monitoring data, taken every 15 minutes, of the differential pressure and water flow rate for two scrubbers (WBW3A Scrubber 1 and WBW3A Scrubber 2) operated at EU-WBW3ALBFORMING (the WBW3 scrubbers). Knauf also provided records of continuous monitoring data taken every 15 minutes of the primary and secondary current, primary and secondary voltage, and water flow rate for two zones of the WEP (WBW3A WEP Zone and WBW3B WEP Zone).

56. In its response to the November Information Request, Knauf provided the differential pressure and water flow rate minimum and maximum limits for WBW3A Scrubber 1 and WBW3A Scrubber 2 based on the most recent stack test at EU-WBW3ALBFORMING. Knauf also provided the

minimum and maximum limits for the primary and secondary current, primary and secondary voltage, and water flow rate for WBW3A WEP Zone and WBW3B WEP Zone.

57. In its response to the February Information Request, Knauf provided the dates and time that EU-WBW3ALBFORMING was not in operation.

58. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the differential pressure minimum and maximum limits for WBW3A Scrubber 1 from November 18, 2021, to November 9, 2023, on 1,460 occasions.

59. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for WBW3A Scrubber 1 from November 18, 2021, to November 9, 2023, on 189 occasions.

60. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the pressure drop minimum and maximum limits for WBW3A Scrubber 2 from November 18, 2021, to November 14, 2023, on 2,409 occasions.

61. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for WBW3A Scrubber 2 from November 20, 2021, to November 14, 2023, on 200 occasions.

62. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the primary current minimum and maximum limits for WBW3A WEP Zone from November 20, 2021, to November 15, 2023, on 12,056 occasions.

63. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the secondary current minimum and maximum limits for WBW3A WEP Zone from November 20, 2021, to November 15, 2023, on 17,229 occasions.

64. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the primary voltage minimum and maximum limits for WBW3A WEP Zone from November 20, 2021, to November 8, 2023, on 1,780 occasions.

65. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the secondary voltage minimum and maximum limits for WBW3A WEP Zone from November 20, 2021, to November 10, 2023, on 1,796 occasions.

66. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for WBW3A WEP Zone from November 18, 2021, to November 13, 2023, on 7,458 occasions.

67. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the primary current minimum and maximum limits for WBW3B WEP Zone from November 20, 2021, to November 15, 2023, on 19,950 occasions.

68. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the secondary current minimum and maximum limits for WBW3B WEP Zone from November 20, 2021, to November 15, 2023, on 24,538 occasions.

69. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the primary voltage minimum and maximum limits for WBW3B WEP Zone from November 20, 2021, to November 14, 2023, on 3,149 occasions.

70. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the secondary voltage minimum and maximum limits for WBW3B WEP Zone from November 20, 2021, to November 11, 2023, on 1,382 occasions.

71. Based on its review of the information in paragraphs 55-57, EPA has determined that Knauf exceeded the water flow rate minimum and maximum limits for WBW3B WEP Zone from November 20, 2021, to November 15, 2023, on 54,429 occasions.

Wool Fiberglass Manufacturing Lines – Calibration

72. In response to the November Information Request, Knauf provided the documentation of the quarterly calibration records for parametric monitoring devices of the WEP and wet scrubbers associated with EU-ML2ALBFORMING, EU-WBW1ALBFORMING, EU-WBW2ALBFORMING, and EU-WBW3ALBFORMING. Knauf did not provide quarterly calibration records for all parametric monitoring devices for the WEP and WBW3 scrubbers from the first quarter of 2022 to the second quarter of 2022.

Wool Fiberglass Manufacturing Lines – Glass Pull Rates at FG-ML2ALB

73. In its response to the November Information Request, Knauf submitted hourly glass pull rates for FG-ML2ALB.

74. Based on its response to the November Information Request, EPA determined that Knauf exceeded its ML2ALB pull rate limit on the ten occasions below:

6/29/2019	6/30/2019	3/3/2020	3/4/2020	8/5/2021
6/16/2022	12/29/2022	7/24/2023	8/23/2023	8/24/2023

Glass Furnaces – Design and Capture

75. During the Inspection, EPA noted that there were several openings within the ductwork from the furnaces to the associated baghouses. EPA also observed that the covers for the furnaces did not enclose the furnaces. EPA viewed fugitive particulate escaping from these openings.

76. During the Inspection, EPA expressed concern with the fugitive particulate emissions seen escaping the furnace and ductwork to the baghouse. Staff stated that each furnace was designed

to be enclosed and that maintenance likely contributed to the gaps and holes within the furnace cover and ductwork.

Glass Furnaces - PM₁₀ Release

77. Knauf provided a process flow diagram in its response to the November Information Request. This process flow diagram indicates that emissions from FG-FURNACE1,3, and 4 are routed through the North Rayjet and South Rayjet baghouses.

78. Knauf provided its BLDS alarm log in its response to the November Information Request.

79. In the BLDS alarm log, Knauf indicated that on September 23, 2023, an estimated 1,398.82 pounds of PM₁₀ were released from the “North and/or South Rayjet”. This is approximately 58.28 pounds per hour for the calendar day.

Glass Furnaces - BLDS Alarm Log

80. In its BLDS alarm log, for nine alarms, Knauf recorded as “unknown” or did not record, at minimum, one of the following: the date that corrective actions were initiated for the alarm, the cause of the alarm, an explanation of the corrective actions, and the date and time the cause was correct for alarms. These alarms occurred on the following dates:

1/25/2020	1/31/2020	1/25/2021	1/26/2021	3/12/2021
4/17/2021	3/25/2022	3/25/2022	9/23/2023	

Glass Furnaces – North and South Rayjet BLDS

81. In its response to the November Information Request, Knauf provided that a TRIBO BLDS had been operated for the North and South Rayjet baghouses from December 1, 2018, to October 2023. In October 2023, the TRIBO BLDS was replaced with an IAC system.

82. In its response to the November Information Request, Knauf provided that the TRIBO system only displayed the last 1000 picoamp data points and did not record picoamp data or setpoints.

83. In its response to the November Information Request, Knauf provided the installation manual for the IAC system (inspection manual).

84. Section 10.2 of the inspection manual states that “during the first months after installation (up to 6 months), it is recommended to perform maintenance of the device monthly”. The inspection manual further states “a monthly interval is recommended for the visual inspection of the device and testing of the device functions”.

85. In the February Information Request, EPA requested for Knauf to describe any maintenance conducted on the IAC system since its installation. Knauf provided that since its installation, the IAC system had received a calibration on March 5, 2024.

Glass Furnaces – Mactiflo BLDS

86. Knauf provided a process flow diagram in its response to the November Information Request. This process flow diagram indicates that emissions from EU-FURNACE#2 are routed through the North Mactiflo baghouse, with the South Mactiflo baghouse used as a back-up (the Mactiflo Baghouses).

87. In its response to the November Information Request, Knauf provided that since December 1, 2018, the DT990 BLDS has been operated for the Mactiflo baghouses.

88. In its response to the November Information Request, Knauf provided that it had discovered that the “Mactiflo’s [BLDS alarm] set point was set higher than 100 picoamps”, which had been the alarm setpoint level Knauf had established for compliance based on emissions testing. The Mactiflo BLDS alarm setpoint had been set at 500 picoamps, the span of the system, since, at minimum, December 1, 2018, to approximately January 16, 2024.

89. Further, in its response to the November Information Request, Knauf provided that the DT990 BLDS only displays the last 1000 picoamp data points and does not record picoamp data or setpoints.

Violations

90. For the dates in Attachment A.1 of this FOV, Knauf violated Condition FG-ML2ALB.IV.1 of the ROPs by failing to maintain pressure drop, and scrubber liquid flow rate values for each of the ML2 scrubbers within 70 percent or more of the lowest value and 130 percent or less of the highest value for each parameter established from the most recent acceptable stack test. Knauf failed to conduct maintenance of its control devices to ensure compliance with the emissions standard at 40 C.F.R. § 60.682.

91. For the dates in Attachment A.2 of this FOV, Knauf violated Condition EU-WBWALBFORMING.IV.1 of the 2015 ROP and Condition FG-WBWALBFORMING.IV.1 of the 2021 ROP by failing to maintain pressure drop, and scrubber liquid flow rate values for the WBW scrubbers within 70 percent or more of the lowest value and 130 percent or less of the highest value established for each parameter from the most recent acceptable stack test. Knauf failed to conduct maintenance of its control devices to ensure compliance with the emissions standard at 40 C.F.R. § 60.682.

92. For the dates in Attachment A.3 of this FOV, Knauf violated Condition EU-WBW3ALBFORMING.IV.1 of the 2021 ROP by failing to maintain pressure drop, and scrubber liquid flow rate values for the WBW3 scrubbers within 70 percent or more of the lowest value and 130 percent or less of the highest value established for each parameter from the most recent acceptable stack test.

93. For the dates in Attachment A.4 of this FOV, Knauf violated Condition EU-WBW3ALBFORMING.IV.3 of the 2021 ROP by failing to maintain the water flow rate, primary and secondary current, and primary and secondary voltage for the WEP within 70 percent or more of the lowest value and 130 percent or less of the highest value for each parameter established from the

most recent acceptable stack test. Knauf failed to conduct maintenance of its control devices to ensure compliance with the emissions standard at 40 C.F.R. § 60.682.

94. From the first quarter of 2022 to the second quarter of 2022, Knauf failed to quarterly recalibrate all monitoring devices serving the WBW3 Line, thereby violating 40 C.F.R. § 60.683(c).

95. From June 29, 2019, to August 24, 2023, Knauf exceeded the ML2AB pull rate limit on ten occasions, thereby violating Condition FG-ML2ALB.III.1. of the ROPs.

96. On April 26, 2023, at minimum, Knauf operated the furnaces in such a manner that particulate emissions generated by the furnaces were not routed to the baghouse controls. Knauf therefore violated Condition FG-FURNACE1,3, and 4.IV.1 and EU-FURNACE#2.IV.1 of the 2021 ROP by failing to operate the furnaces in conjunction with the baghouse controls being maintained in a satisfactory manner. See Photos taken from the Inspection attached to this FOV as Attachment B.

97. On September 23, 2023, Knauf emitted approximately 58.28 pounds of PM₁₀ per hour from the common North and South Rayjet baghouse stack associated with FG-FURNACE1,3, and 4. Knauf therefore violated Condition FG-FURNACE1,3, and 4.I.2. of the 2021 ROP.

98. From January 25, 2020, to September 23, 2023, Knauf failed to identify all items in Condition FG-FURNACE1,3, and 4.VI.2.a. and Condition EU-FURNACE#2.VI.3.b of the ROPs in its BLDS alarm log on nine occasions. Knauf therefore violated Condition FG-FURNACE1,3, and 4.VI.2.a. and Condition EU-FURNACE#2.VI.3.b of the ROPs.

99. From December 1, 2018 to October 2023, Knauf failed to record picoamp data for the TRIBO BLDS at the North and South Rayjet baghouses. From November 2023 to February 2024. Knauf failed to conduct monthly maintenance, visual inspections, and testing of the IAC system at the North and South Rayjet baghouses. Knauf therefore violated Condition FG-FURANCE#1,3,and4.VI.2 of the ROPs by failing to maintain and continuously operate in a satisfactory manner a baghouse leak detection monitor and recorder for EU-FURNACE#1, EU-FURNACE#3, and EU-FURNACE#4.

100. From December 1, 2018, to January 16, 2024, Knauf failed to set an appropriate alarm setpoint for its DT990 BLDS at the Mactiflo baghouse. Since December 1, 2018, Knauf has failed to record picoamp data for the DT990 BLDS at the Mactiflo baghouses. Knauf has therefore violated Condition EU-FURANCE#2.VI.2 by failing to continuously operate in a satisfactory manner a baghouse leak detection monitor and recorder for EU-FURNACE#2.

Environmental Impact of Violations

101. These violations have caused or can cause excess emissions of particulate matter. Particulate matter, especially fine particulates contains microscopic solids or liquid droplets, which can get deep into the lungs and cause serious health problems. Particulate matter exposure contributes to:

- * irritation of the airways, coughing, and difficulty breathing;
- * decreased lung function;
- * aggravated asthma;
- * chronic bronchitis;
- * irregular heartbeat;
- * nonfatal heart attacks; and
- * premature death in people with heart or lung disease.

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