



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

October 21, 2021

Victoria Morton
Environmental Supervisor
Nucor Steel Gallatin
4831 U.S. HWY 42 W
Ghent, KY 41045

Dear Ms. Morton:

This is letter in response to your April 22, 2021, letter to the Environmental Protection Agency (EPA) Region 4 requesting the use of an alternative monitoring procedure for a pickle line scrubber subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Steel Pickling – HCL Process Facilities and Hydrochloric Acid Regeneration Plants in Title 40, Code of Federal Regulations, Part 63, Subpart CCC (40 CFR 63, Subpart CCC) at the Nucor facility in Ghent, Kentucky. In a January 7, 2020 letter, EPA approved the use of conductivity as an alternative parameter for demonstrating compliance with the rule's monitoring requirements for Nucor's pickle line scrubber. This previous approval allowed Nucor to monitor and record scrubber water conductivity and provide makeup water as needed to maintain an appropriate conductivity level in lieu of the measurement and recording of scrubbed water makeup flow rate per 40 CFR §63.1162(a)(2). Recirculation water flowrate was also to be monitored per the rule.

The current request seeks to establish the conductivity monitoring parameter in a way that is not standard for parametric monitoring, which is typically based on the average parameter value over the course of a stack test that demonstrates compliance with the relevant emission standard. Instead, Nucor seeks to establish the conductivity parameter as the maximum value observed during single run of a passing stack test. EPA received additional information from Nucor in emails dated June 3, 2021, June 21, 2021, June 23, 2021, June 25, 2021, July 6, 2021, July 14, 2021, July 21, 2021, and October 11, 2021.

Nucor has described its pickle line scrubber and its operation as follows:

“The pickle line scrubber has a water efficient design. As such, the scrubber does not continually makeup water into the recirculating water system. Instead, the scrubber uses conductivity to determine when makeup water is needed. Conductivity increases as acid fumes are scrubbed from incoming air to the scrubber and the acid is captured in the recirculating water. The scrubber monitors the recirculating water conductivity with [a

conductivity meter that includes] an integrated temperature sensor and controls the makeup water based on predetermined conductivity set points as described in the attached technical specifications from the scrubber manufacturer. The conductivity of the water increases until it reaches the predetermined value triggering the addition of makeup water. Simultaneously, the scrubber flush valve opens, flushing the acid-saturated water out of the scrubber. Between flushing the saturated water and adding fresh water, the HCl concentration in the system is rapidly reduced, ensuring proper scrubber operation and reductions in HCl emissions to the atmosphere. Once conductivity is below another predetermined set point, the makeup water is turned off and the flush valve is closed. Currently, the high trigger point is 70 mS/cm, and the low trigger point is 60 mS/cm.”

In the letter, Nucor provided graphs showing the oscillating nature of the scrubber water conductivity during its 2020 stack test run under the operation scenario described above. The information provided demonstrates that Nucor’s scrubber operated with the specified conductivity set points and the stack test emission rate measured at about 50% of the HCL emission limit. In principle, EPA agrees that this is an adequate alternative operating scenario.

However, EPA has concluded that the proposed parameter (a single conductivity excursion limit derived from a single stack test run) is not adequate to ensure that scrubber operation mirrors that of operation during the stack test. In addition to a conductivity excursion limit, EPA will require that the operational set points (high trigger and low trigger) used throughout the stack test must be in the permit as well. Based on the 2020 stack test, they would be 70 mS/cm and 60 mS/cm, respectively. Additionally, a single stack test run may not correspond to the average operation over the entire stack test (three runs). Accordingly, EPA will require that the proposed maximum conductivity parameter (excursion limit) from a single test run can only be utilized if the corresponding single test run demonstrates compliance with the emission limit. Based on the 2020 stack test, the excursion limit would be set at 81.1 mS/cm

In summary, three monitoring set points will be required for approval of this alternative: conductivity excursion limit (the highest conductivity recorded during a single passing stack test run), high trigger point (makeup water flow on), and low trigger point (makeup water flow off). The requirement for these three monitoring points must be added to Nucor’s permit along with language that requires Nucor to operate the scrubber as described above. None of the set points can be changed without first being utilized in a stack test that demonstrates compliance with the emissions limit and with the written approval of the Kentucky Division for Air Quality (KY DAQ.)

Given the nature of the conductivity monitoring alternative compared to the constant makeup water flow monitoring required in the rule, EPA will require that conductivity be measured continuously and recorded on a more frequent basis. Conductivity must be recorded by electronic system at least once every 15 minutes and corrective action must be initiated if the conductivity is indicated to be above the established excursion limit. Additionally, An “eyes-on” confirmation must be conducted and recorded at least once per day to ensure that conductivity output of the meter and conductivity value recorded in the electronic system correspond with one another. Records must be maintained for 5 years and these recordkeeping requirements must be added to Nucor’s permit.

EPA has noted that reliable monitoring of the scrubber rests largely on the accuracy of the conductivity meter. 40 CFR 63.1165(b)(2)(ii) requires that “*Calibration and manufacturer certification that monitoring devices are accurate to within 5 percent.*” EPA reviewed a calibration certificate dated

August 24, 2020, that was provided by Nucor, and concluded that an inappropriate conductivity reference solution was used. Nucor informed EPA by email on June 25, 2021 that a calibration was completed that utilized a 50 mS/cm reference solution and the meter was shown to underestimate conductivity by 4% prior to adjustment and calibration to within manufacturers specifications. However, EPA has noted that a span (upper range) of 200 mS/cm was used in the error calculation for the June 25, 2021 calibration. Considering that Nucor does not expect the conductivity in the water scrubber to exceed 80 mS/cm, a span of 100 mS/cm would be more appropriate. If the results of the most recent calibration utilized a 100 mS/cm span (upper range) instead of 200 mS/cm, the calculated error would have been 8%, which is above of the 5% specified in the rule. Considering these factors, the following calibration requirements will be required as part of this approval.

In future calibrations, Nucor must use an upper range no higher than 100 mS/cm and shall continue to use a reference solution of 50 mS/cm. Nucor shall conduct calibration in this manner each six months for a period of two years after approval of this alternative. If all calibration reports demonstrate that the conductivity meter is within the required 5% accuracy range over the two-year period, Nucor can return to annual calibration with the written approval of KY DAQ. If the conductivity meter is found to be out of the required 5% range at any point, Nucor must calibrate the meter once every 6 months for an additional two years. These calibration requirements shall be added to Nucor's permit.

Existing requirements of NESHAP CCC, excluding those related to scrubber makeup water flowrate, shall continue to be applicable to Nucor, including excursion corrective action requirements and all other applicable operation and maintenance requirements described in 63.1160(b). This approval only applies to the Nucor facility in Ghent, Kentucky.

This response was developed in coordination with the EPA's Office of Air Quality Planning and Standards and Office of Enforcement and Compliance Assurance. If you have any questions, please contact Jake Carpenter at (404) 562-9039 or at carpenter.jacob@epa.gov.

Sincerely,

KENNETH MITCHELL
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Date: 2021.10.21
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For Caroline Y. Freeman
Director
Air and Radiation Division

cc: Clay Redmond, KY DAQ
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