December 10, 2012

Jon T. Hansen
Designated Representative
Omaha Public Power District
444 South 16th Street Mall
Omaha, NE 68102-2247

Re: Request for Approval of Flow Monitoring Data Recorded at Unit 2 of the Nebraska City Station (Facility ID (ORISPL) 6096)

Dear Mr. Hansen:

The United States Environmental Protection Agency (EPA) has reviewed the April 10, 2012 petition submitted under 40 CFR 75.66 by the Omaha Public Power District (OPPD), in which OPPD requested approval of flow monitoring data recorded at Unit 2 of the Nebraska City Station, over a period of time extending from February 2009 to January 2012. EPA approves the petition, with conditions, as discussed below.

Background

Unit 2 at the Nebraska City Station is a 748 megawatt coal-fired boiler, located in Otoe County, Nebraska. Unit 2 is equipped with a dry lime flue gas desulfurization system to control sulfur dioxide (SO_2) emissions, a selective catalytic reduction system to reduce nitrogen oxides (NO_x) emissions, and a baghouse to control particulate emissions. The unit is subject to the Acid Rain Program. Therefore, OPPD is required to continuously monitor and report SO_2, NO_x, and carbon dioxide (CO_2) emissions and heat input for Unit 2, in accordance with 40 CFR Part 75. To meet the Part 75 monitoring requirements, OPPD has installed and certified continuous emission monitoring systems (CEMS) for SO_2, NO_x, CO_2, and stack gas volumetric flow rate.

Unit 2 commenced commercial operation on October 31, 2008, and began reporting emissions data under the Acid Rain Program on February 19, 2009. During a review of the fourth quarter 2011 electronic data report (EDR) for Unit 2, OPPD noticed that daily interference checks of the flow monitor, which are required for quality-assurance (QA) purposes,[1] were missing from the report. Upon investigation, OPPD discovered that the data acquisition and handling system (DAHS) was not programmed to initiate and record these interference checks; consequently, the results of daily interference checks had not been reported to EPA since February 19, 2009. OPPD contacted its DAHS vendor, Environmental Systems Corporation

[1] See section 2.1.2 of Appendix B to Part 75 and §75.59(a)(2) .

(ESC), to inform them of the programming deficiency. ESC took steps to correct the problem and the DAHS has been initiating and recording daily flow monitor interference checks since January 11, 2012.

On April 10, 2012, OPPD submitted a petition to EPA, requesting Agency approval of the stack gas flow rate data that had been recorded and reported for Nebraska City Unit 2 in the period of time extending from February 19, 2009 to January 11, 2012. According to OPPD, EPA's Emissions Collection and Monitoring Plan System (ECMPS) Client Tool, which is a software program used to pre-screen and evaluate the emissions data prior to submittal, did not detect the absence of flow monitor interference checks in any of the quarterly EDR reports that were submitted for 2009, 2010, and 2011. OPPD received no "critical error" messages or warnings from the ECMPS software that the interference checks were missing.

OPPD's petition for acceptance of the historical flow rate data is based primarily on the high availability of the flow monitor and the results of the other required QA tests of the monitor. According to OPPD, the percent monitor data availability (PMA) of the flow monitor was 99.9 percent at the end of the 3-year time period in question. Furthermore, the monitor passed all of its daily calibration error tests except for one, and passed all of its quarterly flow-to-load ratio tests, quarterly leak checks, and annual relative accuracy test audits (RATAs). OPPD provided summarized results of these tests in the April 10, 2012 petition. The petition also mentions that Unit 2's DAHS was programmed to initiate a 3-minute purge of the flow monitor every hour, as a preventive maintenance measure to keep the probe from plugging.

OPPD believes that, taken together, these considerations demonstrate that the flow rate data recorded from February 19, 2009 to January 11, 2012 are accurate and that the data should be accepted as quality-assured.

EPA's Determination

When the deadline for performing a required QA test of a Part 75 continuous monitoring system passes without the test having been conducted, data from the monitoring system become invalid and substitute data must be reported until the QA test is performed and passed. According to section 2.1.5 of Part 75, Appendix B, each successful daily flow monitor interference check validates data from the flow monitor prospectively for 26 clock hours, at which point another interference check must be passed to maintain data validation. In the case of Nebraska City Unit 2, since no daily flow monitor interference checks were reported in the time period extending from February 19, 2009 to January 11, 2012, all flow rate data recorded during that period would, ordinarily, be invalidated and substitute data would have to be reported.

For a new unit, such as Nebraska City Unit 2, the initial missing data procedures for volumetric flow rate in §75.31(c) apply until 2,160 hours of quality-assured flow rate data have been accumulated. According to §75.31(c)(3), when no prior quality-assured flow rate data

exist,[2] the maximum potential flow rate (MPF) must be reported for each hour of missing data. The MPF for Unit 2 is 120,374,000 standard cubic feet per hour (scfh).

According to the hourly flow rate data reported by OPPD for Unit 2 in 2009, 2010, and 2011, the unit typically operated at flow rates ranging from 40,000,000 to 100,000,000 scfh, with the majority of the data falling between 60,000,000 and 95,000,000 scfh. Replacing these reported flow rates with the MPF would significantly impact the reported SO_2 mass emissions, which are directly proportional to the stack gas volumetric flow rate. If the MPF were used instead of OPPD's reported flow rates, reported SO_2 mass emissions would increase by an estimated 20 to 60% for hours with reported flow rates between 75,000,000 and 100,000,000 scfh, 60 to 100% for hours with reported flow rates between 60,000,000 and 75,000,000 scfh, and 100 to 200% for hours with reported flow rates between 40,000,000 and 60,000,000 scfh.

EPA has reviewed the results of the daily calibration error tests, quarterly flow-to-load ratio tests, quarterly leak checks, and annual RATAs provided by OPPD in the April 10, 2012 petition. The Agency finds that these QA test results strongly support OPPD's assertion that the flow rate data reported for Unit 2 in 2009, 2010, and 2011 are accurate. All of the RATAs and flow-to-load ratio tests, which are the primary indicators of flow monitor accuracy, were easily passed. The successful daily calibration error tests and leak checks, taken together with the high availability of the flow monitor, demonstrate that the day-to-day and quarter-to-quarter operation of the flow monitor in 2009, 2010, and 2011 was acceptable: no significant calibration drift was observed, no system leaks were detected, and the monitor remained in service for more than 97 percent of the unit operating hours over the 3-year period.

In light of these findings, it appears that invalidation of Unit 2's flow rate data and application of the MPF for the entire time period from February 19, 2009 to January 11, 2012, solely on the basis of the missing flow monitor interference checks, would grossly overstate the unit's SO_2 mass emissions. In similar situations where application of the Part 75 missing data provisions has required unrealistically high substitute data values to be reported for an extended period of time, EPA has approved petitions allowing sources to report more reasonable (yet conservatively high) alternative substitute data. This has been especially true in cases where there was a strong technical basis for believing that the data to be replaced, though not fully quality-assured, provided a reasonable estimate of the actual emissions.

EPA is persuaded based on the record of successful daily, quarterly, and annual QA tests during 2009, 2010, and 2011 that OPPD would qualify to use alternative substitute data for the flow rate data reported for Nebraska City Unit 2 for those years. However, the Agency has decided not to use that approach in this instance. Rather, for the reasons explained in the paragraphs below, EPA is accepting the reported flow rate data without any data substitution, as requested by OPPD.

[2] Since OPPD first reported emissions data for Unit 2 on February 19, 2009, no prior quality-assured flow rate data had been recorded as of that date.

The flow monitor installed on Nebraska City Unit 2 is a differential pressure (DP)-type instrument manufactured by EMRC. The monitor uses a calibrated Type-S pitot tube sensor to measure the stack gas velocity. The openings of a pitot tube are subject to plugging in particulate-laden gas streams. For this reason, a periodic blowback ("purge") of the pitot tube is necessary to expel any accumulated particulate matter and keep the openings clear. As noted in the "Background" section above, OPPD's April 10, 2012 petition states that the DAHS was programmed to initiate a purge of the flow monitor during each operating hour.

EPA contacted OPPD and asked whether the blowback periods could be identified by examining the record of stack gas flow rates recorded by the DAHS. OPPD indicated that the flow monitor purges could be clearly seen in the record of minute-by-minute flow rate data.[3] EPA then asked OPPD to provide examples for each calendar year. In response to this request, OPPD sent an e-mail to EPA on May 16, 2012 which included several screen shots as attachments, showing daily flow monitor purges (OPPD indicated in the e-mail that the frequency of the flow monitor purges had been reduced from hourly to daily in 2009 when emissions data began to be reported). In all cases, the measured flow rate before and after each purge was essentially the same, indicating that the pitot tube openings were not plugged. This is not surprising because Unit 2 is equipped with a baghouse which has a bag leak detection system. Particulate emissions from a well-maintained baghouse are expected to be consistently low, making plugging of the flow monitor probe unlikely.

The fact that OPPD performed daily purges of the flow monitor in 2009, 2010, and 2011 is significant because the daily interference check described in Part 75 for a DP-type flow monitor consists of a blowback procedure to prevent plugging of the velocity sensor(s).[4] Therefore, the required daily interference checks of Unit 2's flow monitor, although not reported in the quarterly EDRs for 2009, 2010, and 2011, were actually performed. In view of this finding and the results of the other required QA tests of the flow monitor, EPA accepts the flow rate data reported for Nebraska City Unit 2 for the time period extending from February 19, 2009 to January 11, 2012 as quality-assured. No adjustment of the flow rate data, resubmission of any EDRs, or surrender of SO_2 allowances is required.

The conditions of this petition approval are as follows:

(1) OPPD must continue to perform the required daily flow monitor interference checks of Unit 2's flow monitor and report the results (i.e., pass or fail) in each quarterly EDR;

[3] The purges, which last only for 3 minutes, cannot be seen in the quarterly EDRs because hourly average flow rates, rather than minute-by-minute flow rate data, are reported.

[4] See Part 75, Appendix B, section 2.1.2; Part 75, Appendix A, section 2.2.2.2(b).

(2) OPPD must include a description of the procedure used for the flow monitor interference checks in the quality assurance/quality control (QA/QC) program required under section 1 of Part 75, Appendix B;

(3) In the QA plan for Unit 2, OPPD must clearly state the criterion used to determine whether an interference check is passed or failed; and

(4) If an interference check is failed, OPPD must report substitute data for stack gas flow rate until a subsequent interference check is passed.

EPA's determination relies on the accuracy and completeness of the information provided in OPPD's April 10, 2012 petition and the subsequent e-mail dated May 16, 2012, and is appealable under Part 78. If you have any questions regarding this correspondence, please contact Robert Vollaro at (202) 343-9116. Thank you for your continued cooperation.

Sincerely,

/s/
Reid P. Harvey, Director
Clean Air Markets Division

cc: Jon Knodel, EPA Region VII
Todd Ellis, Nebraska DEQ
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