

January 18, 2005

Gregory F. Black
Designated Representative
Western Kentucky Energy Corporation
145 N. Main Street
P.O. Box 1518
Henderson, KY 42419-1518

Re: Petition to Use an Alternative Method of Missing Data
Substitution for Unit H2 at Western Kentucky Energy
Corporation's Henderson Station Two Facility (Facility ID
(ORISPL) 1382)

Dear Mr.Black:

EPA has reviewed your September 7, 2004 petition under §75.66 in which Western Kentucky Energy Corporation (WKE) requested to use an alternative method of missing data substitution following a missed linearity check, for Unit H2 at the Henderson Station Two facility. As discussed below, EPA approves the petition, in part, and with conditions.

Background

WKE owns and operates two coal-fired boilers, Units H1 and H2, at the Henderson Station Two facility (Henderson) in Henderson, Kentucky. Both units are subject to the Acid Rain Program, and WKE is required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input for the units, in accordance with 40 CFR Part 75. The units are also subject to the NO_x Budget Trading Program and are required to monitor and report NO_x mass emissions and heat input, under title 401 of the Kentucky Administrative Regulations (KAR) Chapter 51, Section 160 (401 KAR 51:160).

To satisfy the NO_x monitoring requirements of the Acid Rain and NO_x Budget Programs, WKE has installed and certified a NO_x-diluent continuous emission monitoring system (CEMS), consisting of a NO_x pollutant concentration monitor and a CO₂ monitor, on each unit. For each hour of unit operation, these monitoring systems measure and record NO_x concentration (in ppm) and CO₂ concentration (in percent CO₂), from which the hourly NO_x emission rate (in lb/mmBtu) is calculated.

As part of its compliance plan to meet the requirements of the NO_x Budget Program, WKE installed a selective catalytic reduction (SCR) unit on Unit H2, just prior to the 2004 ozone season, to reduce NO_x emissions. The emission reductions achieved by the SCR addition are significant enough to trigger the need for a dual-range NO_x monitor. Therefore, on April 20, 2004, WKE replaced the single range NO_x monitor on Unit H2 with a dual range analyzer. As provided in §75.20(b), replacement of an analyzer requires recertification, which, for a NO_x monitoring system, includes the following tests:

- 7 day calibration error test
- Linearity check
- Cycle time test
- RATA
- Bias test

According to §75.20(b)(3), when a monitoring system is recertified, the owner or operator may either: (a) use missing data substitution; or (b) use conditional data validation while the recertification tests are being performed. WKE elected to use conditional data validation and performed a “probationary” calibration error test of the new analyzer on April 20, 2004 to initiate the conditionally valid data status. Recertification testing commenced on April 21, 2004.

All of the required recertification tests of the NO_x monitoring system were performed properly and passed within the time allotted under 75.20(b)(3)(iv), except for the linearity check. According to the conditional data timelines in §75.20(b)(3)(iv), a recertification linearity check must be done within 168 unit operating hours after the probationary calibration error test. If the test is not completed within this time frame, §75.20(b)(3)(viii) specifies that data from the monitor become invalid, beginning with the 169th unit operating hour, and remain invalid until a subsequent linearity check is passed.

Due to an administrative error, WKE performed and passed an abbreviated linearity check within the 168 unit operating hour time frame, instead of a full linearity check. EPA allows an abbreviated linearity check to be performed as a diagnostic test in certain instances, but the test is not suitable for recertification. The abbreviated linearity check consists of only 3 calibration gas injections, whereas 9 injections are required for a full linearity check. The first full linearity check of the new NO_x monitor was performed on July 2, 2004 to satisfy the unit’s third quarter quality assurance requirements.

The failure to perform a full linearity check of the NO_x monitor as part of the recertification process resulted in the emissions data recorded by the monitor being invalidated, in the period extending from the 169th unit operating hour after the probationary calibration error test to the hour of completion of the linearity check on July 2, 2004. In the 2nd and 3rd quarter, 2004 electronic data reports (EDRs) for Unit H2, WKE applied the standard missing data algorithms in §75.33 to this time period and reported substitute data accordingly. However, the standard substitute data values do not accurately represent the manner in which the unit was operated during the missing data period. During that period the SCR was in operation and, so

NO_x emissions were being reduced, on average, by about 90 percent. Generally the substitute data values derived from the standard missing data procedures are based on a lookback through 2,160 hours of quality-assured NO_x data during that period, and reflect the uncontrolled NO_x emission levels prior to the SCR installation. Consequently, it appears that the standard substitute data values for the month of June, 2004 overstate NO_x emissions by a factor of at least ten: The substitute data values are in excess of 0.50 lb/mmBtu, while the average NO_x emission rate recorded by the CEMS in June was 0.047 lb/mmBtu.

In the September 7, 2004 petition, WKE proposed an alternative substitute data methodology that takes into account both the SCR operation and the NO_x emission data collected by the CEMS. Specifically, WKE suggested that a more appropriate substitute data value would be 0.0568 lb/mmBtu, which is the average NO_x emission rate recorded by the CEMS during the time period in question plus one standard deviation. EPA notes that the highest NO_x emission rate recorded during the time period was 0.076 lb/mmBtu. Further, EPA conducted an analysis of the emissions data from the certified monitor after the full linearity was passed (July 2, 2004) until the end of the 3rd quarter (September 30, 2004). This analysis indicated an average NO_x emission rate of 0.0576 lb/mmBtu.

EPA also notes that WKE has undertaken many internal quality assurance / quality control measures since the missed linearity check to prevent a recurrence in the future. These measures include changes to the plant's testing guidelines and policy guidance to ensure that proper quality assurance procedures are followed.

EPA's Determination

EPA conditionally approves WKE's request to use an alternative missing data substitution methodology for NO_x emission rate at Henderson Unit H2, beginning with the 169th unit operating hour after the April 20, 2004 probationary calibration error test, and continuing until the completion of the full linearity check of the NO_x monitor on July 2, 2004. This approval is based principally on the following considerations: (a) the NO_x monitor passed the abbreviated linearity that was mistakenly performed in lieu of a full linearity check; (b) the NO_x monitor passed all of its required recertification tests, including the full linearity check, by July 2, 2004 which was within a relatively short time after they should have been completed; (c) standard substitute data overstates emission by about ten times because of the operation of the SCR, and (d) WKE provided parametric data with the September 7, 2004 petition, documenting the hours in which the SCR was working properly during the missing data period.

Notwithstanding this approval, EPA denies WKE's request to report a NO_x emission rate of 0.0568 lb/mmBtu for the missing data period. The value proposed by WKE is not sufficiently conservative to take into account fluctuations in the controlled NO_x emission rate, which can exceed the 0.0568 lb/mmBtu value proposed by WKE. Instead, WKE shall use the following alternative method to determine the appropriate substitute data value for Unit H2:

- (1) WKE shall identify the first 720 unit operating hours in which:
 - A quality-assured hourly average NO_x emission rate was obtained with

- the recertified NO_x monitoring system; and
 - Sufficient parametric data are available to document that the SCR was operating properly (i.e., that all parameters are within the range of acceptable values defined in the quality assurance plan for the unit).
- (2) WKE shall determine the highest of the 720 NO_x emission rates for the hours identified in Step (1), above, and this value shall be the “maximum controlled NO_x emission rate.”
 - (3) WKE shall report the maximum controlled NO_x emission rate for each hour of the missing data period in which sufficient parametric data are available to demonstrate proper operation of the SCR.
 - (4) For any hour during the missing data period in which there is insufficient parametric data to document that the SCR was operating properly, the maximum potential NO_x emission rate (MER), as defined in section 2.1.2.1 of Appendix A to Part 75 shall be reported.

The above methodology is based on §75.34(a)(3), which, for purposes of missing data substitution, allows sources with add-on NO_x emission controls to petition the Administrator to use the maximum *controlled* NO_x emission rate in a 720-hour lookback period, in lieu of applying the standard missing data routines in §75.33, which might require uncontrolled emission rates to be reported.

In order for such a petition to be approvable, two conditions must be met: (a) the percent monitor data availability (PMA) at the end of the missing data period must be less than 90.0 percent; and (b) parametric data must be available to establish whether the add-on emission controls were operating properly during each hour of the missing data period.

As previously noted, WKE provided parametric data with the September 7, 2004 petition, which demonstrates the operating status of the add-on controls during the missing data period. Further, the 3rd quarter, 2004 EDR report for Unit H2 demonstrates that for NO_x, the PMA was 81.6 percent at the end of the missing data period. Thus, it appears that for the missing data period in question at Henderson Unit H2, conditions (a) and (b), above have both been met, and that WKE qualifies to use the maximum controlled NO_x emission rate in a 720-hour lookback period for missing data purposes.

However, WKE does not have 720 hours of quality-assured NO_x emission rate data for hours in which the SCR was operating before the missing data period¹. In view of this, EPA is

¹ Only the first 168 unit operating hours after the April 20, 2004 probationary calibration error test are quality-assured [40 CFR 75.20(b)(3)(viii)].

allowing WKE to use a combination of quality-assured NO_x emission rate data collected before and after the missing data period to determine the appropriate substitute data value. When reporting missing data, WKE must use the method of determination code (MODC) of 55 to indicate that the hourly data qualifies as “other substitute data approved through petition by EPA.”

EPA’s determination relies on the accuracy and completeness of the information provided by WKE in the September 7, 2004 petition and is appealable under Part 78. If you have any questions or concerns about this determination, please contact Manuel J. Oliva, at (202) 343-9009.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: Wilson Haynes, EPA Region IV
Jerry Slucher, Kentucky DEP
Manuel J. Oliva, EPA CAMD