UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 19 2008

OFFICE OF
AIR AND RADIATION

Patricia J. Diehl
Vice-President, Environmental and Regulatory Affairs
Oxbow Calcining LLC
1601 Forum Place, Suite 1400
West Palm Beach, FL 33401

Dear Ms. Diehl:

This letter represents U.S. EPA's determination of applicability under 40 CFR 72.6(c) of the Acid Rain Program for Oxbow Calcining LLC's (Oxbow) proposed cogeneration project (the proposed project) at its Enid, Oklahoma calcining plant (the Enid plant). This determination is made in response to your letter of September 5, 2007, requesting that a determination be made by U.S. EPA under 40 CFR 72.6(c), and supplemental information subsequently provided (for example, on February 26, May 28, June 23, July 11, and August 18, 2008).

Background

According to Oxbow, Oxbow currently owns and operates a petroleum coke calcining plant in Enid, Oklahoma with three rotary kilns built in 1963, 1966, and 1970 respectively. The production process at the Enid plant involves feeding raw (green) petroleum coke (pet coke) into the rotary kilns, which use natural gas for startup and control of temperature and green pet coke as the primary fuel source. During the calcining process, volatile organic chemicals and moisture are removed from the green pet coke, increasing density and electrical conductivity, so that the resulting calcined coke can be sold for use in the production of materials such as aluminum, titanium dioxide, steel, and chemicals. Oxbow asserts that the proposed project will recover and utilize the waste heat produced by the three existing kilns, which is currently exhausted into the atmosphere through three individual stacks, by attaching a new waste heat boiler to each kiln in order to produce steam. As explained by Oxbow, the steam produced by the new waste heat boilers will flow to a new common steam header connected to a new steam turbine generator, which will have a nameplate capacity no greater than 60 MW, in order to produce electricity for sale.

Analysis

Because each kiln in the proposed project is a combustion device and burns natural gas and petroleum coke, both of which are "fossil fuel," each rotary kiln is "fossil fuel-fired" and a

"unit." In addition, because, upon implementation of the proposed project described by Oxbow, the heat produced in each kiln will be used sequentially for two purposes, first to calcine the green pet coke in the kiln and then to produce electricity at the steam turbine, each kiln will be a "cogeneration unit." See 40 CFR 72.2 (definitions of "cogeneration unit," "fossil fuel," "fossil fuel-fired," and "unit."); and Conoco at 1-2 (Feb. 26, 1999) (determining that rotary kiln serving heat recovery stream generator and steam turbine is a cogeneration unit). Under 40 CFR 72.6(b)(4)(ii), a cogeneration unit that commences construction after November 15, 1990 that supplies no more than 219,000 MWe-hours of actual electric output or no more than one-third of its potential electrical output capacity (PEOC) for sale to a utility power distribution system during its first year of operation and on an annual average basis during every rolling three-year period starting with that first year is not a utility unit and is therefore not an affected unit under the Acid Rain Program.[1] If a cogeneration unit does not exceed the electricity sales threshold during the first year of operation but exceeds that threshold during some subsequent rolling three-year period, the cogeneration unit becomes an affected unit starting January 1 of the year immediately following that three-year period. See Conoco at 3.

Under 40 CFR 72.2 and appendix D of 40 CFR part 72, the PEOC of a cogeneration unit is calculated using the maximum design heat input capacity of the unit. Specifically, the unit's PEOC equals the maximum design heat input capacity in Btu/hr, divided by 3 (to reflect the unit's assumed thermodynamic efficiency), by 3,413 Btu (to convert to kilowatt-hours), and by 1,000 kw (to convert to megawatt-hours). Under 40 CFR 72.6(b)(4)(ii), the cogeneration unit's PEOC is used in turn to determine how much electricity the cogeneration unit can produce for sale without exceeding the electricity sales threshold and becoming an affected unit under the Acid Rain Program.

In cases where 40 CFR 72.6(b)(4)(ii) has been applied, the cogeneration unit was generally either a boiler or a combustion turbine. In the instant case, each cogeneration unit in

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[1] Rotary kilns 1, 2, and 3 at the Enid plant were constructed prior to November 15, 1990. However, there is no indication that they were originally constructed to be or to become cogeneration units. On the contrary, they have operated for about 40 years (including almost 20 years since November 15, 1990) without having the additional equipment (e.g., waste heat boilers, a steam turbine generator, and associated steam ductwork and electric lines) necessary to be able to cogenerate. Moreover, even today, no final decision has been reached to construct such equipment, and its construction has not begun. In short, this is not a case where construction of what was intended to be cogeneration units began before November 15, 1990 and may simply take beyond 1990 to complete. Instead, if and when Oxbow constructs the additional equipment and the kilns therefore become cogeneration units, this construction will be the realization of a cogeneration project adopted long after November 15, 1990. Under these circumstances, EPA believes that it would be illogical to treat the kilns as cogeneration units commencing construction on or before November 15, 1990 and that 40 CFR 72.6(b)(4)(ii) (covering cogeneration units commencing construction after November 15, 1990) -- rather than 40 CFR 72.6(b)(4)(i) (covering units commencing construction on or before that date) -- should be applied if and when the kilns are modified through the proposed project.

the proposed project will be a kiln whose purpose currently is to produce a purer form of pet coke (i.e., calcined pet coke, which has less volatile organic chemicals and moisture than the green pet coke originally put into the kiln). Because a major purpose of the kilns in the proposed project will continue to be the production of a purer form of pet coke (in addition to the new purpose of producing steam for generating electricity for sale), the green pet coke -- which will be the primary fuel used in the project and will be supplemented by natural gas -- will not be burned completely. In fact, minimizing the percentage of the primary fuel that is burned in order to calcine the coke maximizes the amount of by-product calcined coke that remains and is available for sale. In contrast, where a cogeneration unit is a boiler or combustion turbine whose purpose is to produce steam for industrial or commercial use and generate electricity for sale and not to produce a physical by-product, the owner or operator generally aims at burning the primary fuel (e.g., coal or natural gas) as completely as possible (consistent with other operating goals, such as control of emissions) in order to have as much heat output as possible available for use in producing steam and electricity.

As a consequence of this difference, the maximum design heat input capacity is determined differently in the case of the kilns in the proposed project than in the more usual case where the cogeneration unit is a boiler or combustion turbine. Whereas the maximum design heat input capacity of a boiler or combustion turbine is the total heat input of the maximum amount of fuel that can be fed into the boiler or combustion turbine in an hour, the maximum design heat input capacity of each kiln in the proposed project is some portion of the total heat input of the maximum amount of fuel that can be fed into the kiln per hour. This reflects the fact that, unlike fuel in a boiler or combustion turbine, the green pet coke is only partially combusted and a significant portion of the heat input of the green pet coke is intentionally retained in the by-product calcined coke.

Generally, the maximum design heat input capacity of a boiler or combustion turbine that is a cogeneration unit is specified by the manufacturer in mmBtu/hr. However, according to Oxbow, rotary kilns used for calcining are not generally rated by the manufacturer in terms of maximum design heat input capacity in mmBtu/hr, but rather in terms of how many tons of green pet coke per hour can be fed into the kilns. Oxbow states that its kilns are rated in this manner. (Alternatively, some manufacturers apparently rate kilns in terms of how many tons of calcined coke can be produced.) Therefore, only for the purposes of this determination, U.S. EPA calculated the maximum design heat input capacity of the kilns in the proposed project based on the sum, for an hour when calcined coke is being produced, of: (1) the total heat input of the maximum amount of natural gas that can be combusted in the kiln; and (2) the maximum portion of heat input of the maximum amount of green coke that can be combusted in the kiln.[2]

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[2] EPA rejects the approach taken in Conoco at 3, n.2 as inappropriate in the instant case and in future cases applying 40 CFR 72.6(b)(4)(ii). In Conoco, EPA used the maximum design heat input capacity of the steam generator served by the rotary kilns in a proposed energy conservation project, rather than the maximum design heat input capacity of the respective kilns themselves, to determine each kiln's PEOC and the electricity sales threshold. (In Conoco, all heat input would have been from fuel combusted in the kilns since the waste heat boiler

With regard to the first value, according to Oxbow, the total heat input of the maximum amount of natural gas that can be burned at each of the kilns is and, upon completion of the project will continue to be, 60 mmBtu/hr. With regard to the second value, U.S. EPA determined the maximum heat value of green pet coke that can be burned as the product of the highest possible Btu-value of the green pet coke, and the highest possible feed rate of green pet coke in tons per hour (Tph), for the proposed project. According to Oxbow, vendor sampling of green pet coke delivered to the Enid plant by train or truck shows that the Btu value of the green pet coke has ranged, and will continue to range, as high as 15,100 Btu/lb. Also according to Oxbow, the highest possible feed rate for rotary kilns 1 and 2 is 40 Tph each and for rotary kiln 3 is 35 Tph.[3] Oxbow asserts that the highest percentage of green pet coke combusted to produce calcined pet coke in the kilns has been, and will continue to be, 30%.[4] Therefore, considering the maximum amount of natural gas that can be burned, the maximum heat value for the green pet coke, maximum feed rates for each kiln, and the maximum percentage of green pet coke combusted in the process, U.S. EPA concludes that the maximum design heat input capacity for kilns 1 and 2 is 422.4 mmBtu/hr each and for kiln 3 is 377.1 mmBtu/hr.[5]

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producing steam for the steam generator would not have had auxiliary firing.) On the face of the regulation, the electricity sales threshold comprises one-third of the PEOC of the unit (here, the kiln), not of the generator, or 219,000 MWe-hrs, whichever is lower.

[3] The feed rates for the kilns reflect the physical limitations of the equipment. According to Oxbow, actual feed rates have been, and will continue to be, much lower.

[4] According to Oxbow, typically only about 20% to 22% of heat input of the green pet coke has been, and will continue to be, combusted during the calcining process.

[5] For kilns 1 and 2, maximum design heat input capacity equals 422.4 mmBtu/hr, calculated as follows: 15,100 Btu/lb (highest heat value of green pet coke) multiplied by 2,000 lb/ton, by 40 Tph (highest hourly feed rate), and by .30 (the highest percentage consumption of green pet coke heat input during the calcining process) and divided by 10^6 Btu/mmBtu (to convert to mmBtu); plus 60 mmBtu (heat value of the maximum amount of natural gas burned in an hour). For kiln 3, the same figures are used, except that 40 Tph is replaced by 35 Tph to reflect the kiln's smaller capacity, yielding 377.1 mmBtu/hr. This approach to estimate maximum design heat input capacity is conservative because, according to Oxbow, the greater the amount of natural gas burned during the calcining process, the lower the percentage of the green pet coke heat input that is consumed. This approach uses both the maximum amount of natural gas that can be burned and the maximum percentage of heat input of the green pet coke that will be consumed.

It follows then that the PEOC for kilns 1 and 2 is 41.3 MWe and for kiln 3 is 36.8 MWe.[6] Since one-third of the PEOC for each of kilns (120,596 MWe-hrs each for kilns 1 and 2 and 107,456 MWe-hrs for kiln 3)[7] is less than 219,000 MWe-hrs, under 40 CFR 72.6(b)(4)(ii) each kiln may provide up to an average annual amount of 219,000 MWe-hrs of electrical output for sale to a utility power distribution system in the first year of operation in the proposed project and in each rolling 3-year period starting with that first year and not be considered an affected unit under the Acid Rain Program.

Conclusion

U.S. EPA concludes that the kilns in the proposed project will not be affected units under the Acid Rain Program if they do not provide more than 219,000 MWe-hrs of electrical output for sale to a utility power distribution system in the first year of operation in the proposed project and on an annual average basis in each rolling 3-year period starting with that first year. However, any of the kilns that does not exceed the electricity sales threshold during the first year of operation in the proposed project, but that exceeds that threshold during some subsequent rolling three-year period, will become an affected unit starting January 1 of the year immediately following that three-year period. As an affected unit, the kiln will have to comply with all applicable requirements under the Acid Rain Program. This includes the requirements to apply for and receive an Acid Rain permit (under 40 CFR part 72), to hold allowances to cover sulfur dioxide emissions (under 40 CFR parts 72 and 73), and to monitor and report emissions (under 40 CFR part 75).

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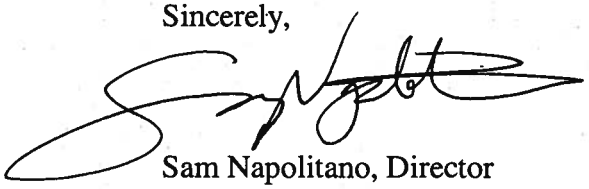
[6] For kilns 1 and 2, PEOC equals the maximum design heat input capacity of 422.4 mmBtu, multiplied by 10^6 Btu/mmBtu, and divided by 3 (reflecting the assumed thermodynamic efficiency), by 3,413 Btu (to convert to kilowatt-hours), and by 1,000 Kw (to convert to megawatt-hours) to yield 41.3 MWe. For kiln 3, the same figures were used except that 422.4 mmBtu was replaced by 377.1 mmBtu to reflect the kiln's smaller capacity, yielding 36.8 MWe. See 40 CFR part 72, appendix D (explaining how to calculate PEOC).

[7] This figure is calculated by multiplying the PEOC by 8,760 hr/yr and dividing by 3. See 40 CFR 72.6(b)(4)(ii).

U.S. EPA's applicability determination is based on the representations made in Oxbow's September 5, 2007 request for an applicability determination and in the supplemental information subsequently provided by Oxbow, including the information provided on February 26, May 28, June 23, July 11, and August 18, 2008 and all information discussed above concerning Oxbow's assertions (for example, assertions concerning the description of the proposed project, maximum Btu value of the green pet coke, maximum green pet coke feed rates and maximum percentage of green pet coke combusted). This determination relies on the accuracy and completeness of those representations and is appealable under 40 CFR part 78. The applicable regulations require you to send copies of this letter to each owner or operator of the project (40 CFR 72.6(c)(1)). If you have further questions regarding the Acid Rain Program, please contact Robert Miller at (202) 343-9077.

Sincerely,



Sam Napolitano, Director
Clean Air Markets Division

cc: Joyce Johnson, U.S. EPA Region 6
Constance Burris, Oklahoma DEQ