



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY§§§
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

October 23, 1998

Mr. John M. Daniel, Jr., P.E., DEE
Director, Division of Air Program Coordination
Commonwealth of Virginia
Department of Environmental Quality
P.O. Box 10009
Richmond, Virginia 23240

Dear Mr. Daniel:

I am writing in response to your letter dated September 24, 1998, regarding a PSD applicability question on a recent PSD-avoidance permit action for Internet Corporation's Archer Creek Facility. In your letter you ask EPA to respond to the following question:

What constitutes debottlenecking, and how are the emission increases from debottlenecked units calculated?

In order to respond to your question, you must refer to the PSD regulations at 40 C.F.R. §52.21(b)(2) which defines "major modification" as one in which a physical change in or change in the method of operation of a major stationary source results in a significant net emissions increase. The first step in this process is to determine the emissions change from the proposed project. At this point, only emissions increases expected to result from the proposed project are examined. This includes emissions increases from the new and modified emissions units and any other plant-wide emissions increases (e.g. debottlenecking increases) that will occur as a result of the proposed modification. (See the October 1990 Draft New Source Review Workshop Manual, page A.46).

In your question, you are asking for EPA's position on the quantification of the plant-wide emissions increases from the mold cooling lines resulting from replacement of the cupolas. Prior to the modification, the capacity of the mold cooling lines was limited or hindered by the maximum throughput of the cupolas. The replacement of these cupolas has removed this hindrance or bottleneck by increasing the rate at which molten metal can be fed to the cooling lines. Hence, although the design capacity of the mold cooling lines has not been changed as a result of the modification, its effective capacity and potential to emit have been changed. This effective change in capacity of the mold cooling lines constitutes debottlenecking, and these emissions increases must be included in the initial PSD applicability calculations.

In calculating the emissions change resulting from the modification and debottlenecked units, EPA requires that the emissions change for these units be based on their allowable emissions after the change minus their current actual emissions. "Actual emissions" before the change equals the average rate in tons per year at which the unit actually emitted the pollutant

during the 2-year period (or more representative period) which precedes the change [see 40 CFR 52.21(b)(21)(ii)]. The allowable emissions level for a new or modified emissions unit is its potential to emit. EPA's policy on determining whether a physical change or change in the method of operation at a source will result in a "significant emissions increase" is discussed in more detail in EPA's October 1990 Draft NSR Workshop Manual. EPA's policy is also discussed in a September 18, 1989, memorandum from John Calcagni, Director Air Quality Management Division, EPA Office of Air Quality Planning and Standards (OAQPS), which you referenced and enclosed with your letter, and in a memorandum entitled "Potential Enforcement Action Against Masonite Corporation", from John S. Seitz, Director, EPA's Office of Air Quality Planning And Standards and Michael S. Alushin, Enforcement Counsel for Air to David Howekamp, Director, Air and Toxics, EPA Region IX and Nancy Marvel, Regional Counsel, EPA Region IX (enclosed for your information).

EPA's current guidance is clear on calculating significant emissions increases resulting from major source modifications and requires the Option 1 approach outlined in your letter. EPA does not allow the approach outlined in Option 2. Although certain examples may have been discussed at a workshop which you feel support the Option 2 approach, these types of informal discussions do not address issues in their full context and certainly are not to be viewed as representing a formal EPA position on an issue, nor should they be relied upon by a State or source as a basis for establishing new policy or, in this case, deviating from established EPA policy. In your letter, you also state that discussions with EPA OAQPS staff members lend support to using the Option 2 approach. Telephone conversations with EPA staff, which may take comments out of context, do not establish EPA policy. EPA's OAQPS, Office of General Counsel, and Office of Enforcement and Compliance Assistance have been consulted on this matter and all agree that Option 1 is the correct approach to be followed as it conforms with established EPA policy on debottlenecking.

If you have any questions or comments, please contact me at (215) 814-2175 or Donna Weiss of my staff at (215) 814-2198.

Sincerely,

Kathleen Henry, Chief
Permits and Technical Assessment Branch

Enclosure

cc: Gary McCutchen, RTP Environmental Associates, Inc.

September 24, 1998

Ms. Kathleen Henry
Permits Manager
Region 3, EPA
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Ms. Henry:

Intermet Corporation's Archer Creek Facility has asked the Virginia Department of Environmental Quality (VADEQ) to address a PSD applicability question associated with a recent PSD-avoidance permit action. Specifically, Intermet has requested that VADEQ determine EPA's current guidance on how to define and quantify the creditable emission increases from "debottlenecked" emissions units. Because Intermet's and many other PSD-avoidance permits issued by the VADEQ include an analysis of debottlenecked emissions units, VADEQ seeks a definitive statement of EPA's position on this substantive issue. Furthermore, it is VADEQ's opinion that the requested guidance will foster consistency not only on a state-wide basis, but also nation-wide.

Background

Intermet Corporation owns and operates its Archer Creek Plant (AC) in Campbell County, Virginia. AC is a gray and ductile iron foundry (SIC Code 3321) that produces parts used by the automotive industry. AC is a PSD-sized major source that was originally constructed in 1972. The original plant construction was permitted through a Virginia NSR permit dated May 31, 1972. Several minor NSR permits have been issued to AC over the subsequent years; with the most recent one dated June 10, 1997. The facility has not been permitted under PSD regulations.

AC's operations include six major process steps: (1) metal melting in the facility's cupolas, (2) molten metal treatment, (3) metal pouring into molds, (4) metal cooling in the mold cooling lines, (5) metal finishing, and (6) sand handling. For simplicity in addressing the debottlenecking question, the following discussion focuses only on the cupola and metal cooling steps of the operation.

The primary focus of the June 1997 permit was the facility's cupolas. The old cupolas were removed and new, higher-capacity cupolas were installed. The mold cooling lines were not modified as part of this project because they were neither physically nor operationally changed. The maximum rated capacity of the mold cooling lines remains greater than either the old cupola capacity or the new cupola capacity, so that the mold cooling lines continue to be bottlenecked, although somewhat less than before the cupola project. Also, it should be noted that the maximum achievable capacity of the mold cooling lines is equal to the cupola capacity since there is no other source for the molten metal.

Some pertinent production rate information is helpful to the following discussion. (Note: The numeric values of production rates included below are for discussion purposes only and their inclusion in this letter should not be taken as an indication of VADEQ endorsement.) The actual cupola melt rate for the most recent two-year period was 201,000 tons per year. The pre-modification cupolas were capable of melting as much as 482,000 tons per year (i.e., 55 tons per hour * 8760 hours per year) of metal. The post-modification cupolas are rated at 569,000 tons per year (i.e., 65 tons per hour * 8760 hours per year.) The mold cooling lines were and continue to be capable of handling 701,000 tons per year (i.e., 2 lines * 40 tons per hour each * 8760 hours per year) of metal. The cupola production level permitted in the June 1997 permit was selected to avoid PSD review. Thus, the selected level could depend on the approach used to quantify the emissions increase associated with the debottlenecked emissions units. If Option 1 (see below) is used, the requested production is 276,000 tons per year of metal. If Option 2 is used, let's assume that the requested production would be 430,000 tons per year.

First, though, we need to make sure that we are using the correct terminology. This letter refers to the unit(s) undergoing the physical or operational change (or the new units replacing old units) as the modified unit(s) or new unit(s.) If the modification “frees up” capacity upstream or downstream in the process, the modification is said to “debottleneck” that portion of the process. When we request a policy determination on calculating debottlenecked emissions, we are referring to the emissions increase that EPA policy requires to be included as a part of the emissions increase “resulting from” the modification. At the foundry, the new cupolas are the modification. It must be determined if the mold lines, which are downstream from the cupola, are being debottlenecked and, if so, the emissions increase associated with this debottlenecking.

Question:

What constitutes debottlenecking, and how are the emission increases from debottlenecked units calculated?

Option 1:

One option for calculating these creditable debottlenecking emission increases is to apply the same method used for calculating creditable increases from the modified equipment. Specifically, calculate the difference between the Potential to Emit from the mold cooling lines after the modification and the prior actual emissions from these lines. The source’s requested cupola throughput limitation of 276,000 tons per year was calculated as the maximum level that could be obtained while avoiding PSD applicability. The baseline for calculating the emissions increase associated with the debottlenecked cooling line is the same as the modified emissions units. This baseline is the actual two-year average production of 201,000 tons per year.

For Archer Creek’s specific case, the calculation is as follows (Note: since there is generally no change in emission factors or capture and control equipment used, the meaningful portion of the calculation is the change in throughput) :

$$\text{Throughput}_{\text{REQUESTED}} - \text{Throughput}_{\text{PAST ACTUAL}} =$$

$$276,000 \text{ tons/yr} - 201,000 \text{ tons/yr} = 75,000 \text{ tons/yr}$$

Therefore, the creditable emissions increases for the debottlenecked molding lines are a function of change in throughput of 75,000 tons/yr of metal.

Option 2:

Option 2 is the approach identified by Archer Creek as the appropriate method for determining if non-modified units are debottlenecked, and, if so, how to calculate the accompanying emissions increase. This option focuses on the maximum amount of capacity actually being debottlenecked, rather than the difference between actual and potential emissions. Specifically, calculate the emissions resulting from the amount of capacity freed up by the modification.

EPA's policy on quantifying emission increases associated with debottlenecked emissions units was addressed at a recent air permitting workshop held in Williamsburg, Virginia on April 23rd and 24th, 1998. The course was a part of the "Fundamentals of New Source Review Workshop Series" sponsored by the Air and Waste Management Association in cooperation with EPA's Office of Air Quality Planning and Standards (OAQPS.) Mr. Mike Sewell of that office served as the Technical Chair. A slide presented by Mr. Gary McCutchen (See Attachment 2), a speaker at the workshop and a former member of the New Source Review Section within OAQPS, generated a question as to EPA's policy on calculating emission increases associated with debottlenecked emissions units. The PSD applicability question was posed in the form of the following hypothetical scenario.

Suppose a widget "line" consists of two emissions units: a widget maker (unit A), and a widget coater (unit B). The widget maker, unit A, is being modified, but Unit B does not undergo any physical change or change in the method of operation. The original unit A was permitted at and capable of manufacturing 100 widgets per year. Over the most recent two-year period, the widget maker has only manufactured an average of 50 widgets per year. Unit B has always been capable of handling up to 200 widgets per year, but was bottlenecked by unit A. The modified unit A will be permitted at 175 widgets per year, because it is capable of manufacturing at least 175 widgets per year. The net emissions increase from the modified unit A is calculated from the emissions associated with the increase in widget production from 50 to 175 widgets per year (old actuals to new potential.) Is the emissions increase associated with the debottlenecked unit B calculated as the emissions associated with a production increase from a baseline of 50 or a pre-modification process capacity of 100 widgets per year to the emissions associated with the new allowable of 175 widgets per year? [Note that the 50 widget per year baseline corresponds to Option 1 and the pre-modification capacity of 100 widgets per year corresponds to Option 2.]

We understand that the answer from both Messrs. McCutchen and Sewell was that the correct baseline for debottlenecked emission unit (i.e., Unit B) would be 100 widgets per year. That is, the emissions associated with an increase in widget production from 100 to 175 per year would be the creditable emissions increase from debottlenecked equipment.

In the case below, the bottlenecking equipment (i.e., cupola) is limited to a post-modification production level that is less than what the downstream equipment (i.e., mold cooling line) was capable of achieving prior to the cupola modification. Therefore, no debottlenecking has taken place. Since the mold cooling process is not modified nor is it debottlenecked, it would not be considered in calculating the net emissions increase associated with the modification. The emissions increase used to determine PSD applicability would be based solely on the modified emissions units, since no debottlenecking is taking place.

For Archer Creek's specific case, the calculation is as follows:

Post-Modification Capacity (requested) - Pre-Modification Capacity =

430,000 tons/yr(requested) - 482,000 tons/yr of metal = no increase in capacity

Had the requested post-modification capacity been greater than the pre-modification capacity (e.g., 500,000 tons/yr), the emissions increase associated with the debottlenecked equipment would be the difference in emissions between the post-modification (500,000 tons per year) and pre-modification (482,000 tons per year) capacity levels.

Support for each Option

Support for Option 1 may be found in at least two places. First, this methodology is described in the 1990 Draft of the New Source Review Manual, in Chapter A, Section III.B.6, on page A.53. Secondly, it is discussed in the PSD policy memo dated September 18, 1989, from Mr. John Calcagni in the response to Question 3 (NSR Notebook Reference. 4.42. See Attachment 1.) It should be further noted that in the introductory paragraphs of the 1989 memo, Mr. Calcagni states that his response provides "general guidance on ... the questions raised...."

Support for Option 2 may be found in the handouts distributed at the air permitting workshop held in Williamsburg, Virginia on April 23rd and 24th, 1998 (See Attachment 2.) Additionally, this approach was confirmed by Intermet in recent telephone conversations to various EPA OAQPS staff members (specifically, Mike Sewell, David Solomon and Dennis Crumpler.)

The Path Forward

VADEQ believes that the "process capacity" approach (ie., Option 2 above) accurately describes the method currently supported by EPA's Office of Air Quality Planning and Standards, and that this approach yields a value of the creditable emissions which is reasonable to both the regulated community and to the ambient air. Therefore, VADEQ plans to process Archer Creek's forthcoming application for a permit revision using the Option 2 approach by October 26, 1998 unless we hear differently from your office by that date.

Your prompt assistance with matter is appreciated. If you have any questions or need additional information, please call Mr. Tom Berkeley (VADEQ) 804-582-5120.

Sincerely,

John M. Daniel, Jr., PE, DEE
Director, Division of Air Program Coordination

attachments: (2)

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cc: Mr. David A. Solomon, (MD-12) OAQPS, ITPID, IIG; U.S. EPA, RTP, NC 27711
Mr. William D. Hopkins, Intermet -Archer Creek Plant
Ms. Donna Weiss, EPA Region III
Mr. Thomas L. Henderson, Director, West Central Regional Office, VADEQ