DIVISION OF AIR QUALITY

May 4, 2001

MEMORANDUM

To: Section Chiefs
Regional Supervisors

From: Michael Y. Aldridge, Stationary Source Compliance Branch (SSCB)

Subject: Particulate Emissions from Hot Mix Asphalt (HMA) Plants

The purpose of this memo is to summarize the technical review of information regarding the particulate emissions from HMA plants. Specifically, the Technical Services Section / SSCB has been asked to provide guidance regarding the type(s) of particulate emissions from HMA plants per 15A NCAC 2D .0501(c)(3) as applicable to 2D .0506 "Particulates from Hot Mix Asphalt Plants."

The SSCB submits that HMA plants are "sources…known to emit organic material (oil, pitch, plasticizers, etc.) which exist as finely divided liquid droplets at ambient conditions" as set forth in 2D .0501(c)(3). This position is supported by the following:

1. Upon a simple review of the HMA process operations, it is apparent that HMA plants are likely to emit "organic material" as specified above. The process of producing HMA involves the mixing of aggregate material with asphalt cement at elevated temperatures. The asphalt cement consists of the same "organic material (oil, pitch, plasticizers, etc.)" described per 2D .0501(c)(3). The mixing of the cement material at the elevated temperatures provides the mechanism(s) necessary for producing organic, condensible particulate emissions.
2. The supposition in Item 1. is further supported by AP-42 Chapter 11.1 "Hot Mix Asphalt Plants". In describing the emissions from HMA plants, EPA specifies that the emissions contain "gaseous organic compounds and a fine aerosol of condensed organic particles. [The] organic aerosol is created by the condensation of vapor into particles during cooling of organic vapors". EPA further describes this type of emissions as "organic compounds…[which] condense to form a fine organic aerosol or 'blue smoke' plume."
3. Subsequent demonstration of these "organic material" emissions is provided in the HMA particulate test results submitted to DAQ. DAQ has reviewed filterable and condensible particulate emissions tests from sixteen (16) HMA plants since May 1999. Based on the results, the methylene chloride-extractable particulate matter (also known as the Method 202 "organic fraction") averaged 161% of the filterable particulate matter. The condensible particulate matter averaged 63% of the total particulate matter emissions.

The SSCB position that HMA plants are "known to emit organic material" is based on a review of the HMA process, the conclusions of which are substantiated by EPA's AP-42 documentation. This position is further demonstrated through actual emissions data from tests performed at HMA plants in North Carolina.

Based on the above facts, the language per 2D .0501(c)(3) and (c)(18), and the NCCBI Consent Agreement Stipulation 1(a); Compliance with 2D .0506 should be determined via EPA Methods 5 and 202.

Please note also that the particulate emission limit per 2D .0506 does not pertain solely to the dryer stack emissions.

15A NCAC 2D .0506 states:

*"**.0506 PARTICULATES FROM HOT MIX ASPHALT PLANTS***
(a) The allowable emission rate for particulate matter resulting from the operation of a hot mix asphalt plant shall not exceed the level calculated with the equation $E = 4.9445(P)^{0.4376}$ *calculated to two significant figures, where "E" equals the maximum allowable emission rate for particulate matter in pounds per hour and "P" equals the maximum process rate in tons per hour. The allowable emission rate shall be 60.0 pounds per hour for process weights equal to or greater than 300 tons per hour.*
(b) All hot mix asphalt plants shall be equipped with a fugitive process dust control system for the drying, conveying, classifying, and mixing equipment which shall be operated and maintained in such a manner as to reduce to a minimum the emission of particulate matter from any point other than the stack outlet. Emissions from this equipment shall be controlled such that the applicable opacity standards in Rule .0521 or .0524 of this Section are not exceeded.
(c) Fugitive non-process dust emissions shall be controlled by Rule .0540 of this Section."

In many cases the main dryer stack represents only part of the "particulate matter resulting from the operation of a hot mix asphalt plant". While the dryer stack emissions usually account for the majority of the particulate emissions, there are cases where additional, significant particulate emissions occur elsewhere. The mixing tower (or pug mill) at a batch HMA plant can represent such an emission source when the fugitive control system required by 2D .0506(b) is not tied into the main dyer stack outlet.

The testing information referenced in this memo came as a direct result of the October 6, 1999 memo from Alan Klimek requiring condensible particulate emissions data from NC facilities. DAQ will continue to collect this information in order to characterize condensible particulate matter emissions from additional source categories. This information will allow DAQ to identify what source types are or are not significant sources of condensible particulate. The information will also provide additional insight into sources that are or are not "known to emit organic material" in the context of 2D .0501(c)(3) and the NCCBI Settlement Agreement.

Cc: Alan Klimek, Director
Thom Allen
D.R. van der Vaart
Shannon Vogel, SSCB