TRIP REPORT TO DUPONT

POLY(ETHYLENE TEREPHTHALATE) PLANT
Kinston, NC

Regarding Comments on the Proposed New Source
Performance Standards for the Polymer Manufacturing Industry
(ESED Project No. 78/24)

I. PURPOSE

To clarify comments received from duPont concerning the proposed standards for PET plants.

II. PLACE AND DATE

E.I. duPont de Nemours and Company
P.O. Box 800
Kinston, NC 28501
February 21, 1989

III. ATTENDEES

Jerry D. Henderson, duPont
Larry Williams, duPont
Robert R. Edging, duPont
Tom Kittleman, duPont
Sims Roy, U.S. EPA
Bob Rosensteel, U.S. EPA
Victor Copelan, NC DEM
W.F. Bulow, NC DEM
Ken Meardon, PES

IV. DISCUSSION

Mr. Henderson opened the meeting by providing a brief overview of the plant. The Kinston plant was the world's first PET plant, with production beginning in March, 1953.

The only product made at the plant is Dacron® polyester. The plant has its own wastewater treatment facility, which handles both process and sanitary wastes.

After reviewing the purposes of the meeting, Mr. Henderson briefly reviewed the production processes.

The temperature of the production process increases and the pressure decreases as the product moves from the exchange column to the finisher.

The vacuum on all the process lines are drawn by steam jet ejectors. The effluent from the vacuum systems for some of the process lines go to one of two cooling towers. The effluent from the vacuum

systems for the other process lines go directly to the wastewater treatment plant (WTP). These vacuum systems are referred to as "single-pass" systems. Mr. Henderson pointed out that the trend is to installing cooling towers in order to recirculate water for purposes of water conservation. Mr. Henderson indicated that duPont intends to install some time in the future a cooling tower for the single pass vacuum systems.

The jets pull mostly noncondensibles off of the spray condensers. The noncondensibles contain some EG, although by far the majority of EG is condensed in the spray condenser. The condensed EG is sent to an overflow storage tank and sent offsite for reclamation. The condensed EG is about 92 to 93% EG, with less than 2% water.

DuPont noted that they do not make any routine measurement of EG in the steam jet systems, although they could measure it in the jet hotwells. Effluent from the jet hot wells for the single pass vacuum systems are sent directly to the wastewater treatment plant and overflow from the cooling tower is also sent to the WTP. DuPont uses in-line total carbon analyzers to check on COD content in the effluent going to the WTP. The data collected are used in-house to help identify any process problems. An increase in COD content would indicate a problem in the process. Where an increase in COD is detected in the overflow from the cooling tower, the effluent from the jet hotwell can cause the entire site wastewater stream to be diverted from the WTP into smaller emergency retention cells. Immediate corrective action is required.

When asked about the EG content of these streams to the WTP, duPont indicated that for the effluent from the single pass vacuum system it was calculated to be about 0.04% EG. DuPont noted that this calculated number was a "worst-case" calculation, and that this effluent stream was diluted approximately 5 times. Total plant flow to the WTP is between 1,700 and 1,800 gpm. For the overflow streams from the cooling tower, duPont did not know the EG concentration, but indicated it should be less than 0.04 percent. When asked about a relationship between COD and EG concentration, duPont indicated that there is a good correlation, but was not sure of the numerical relationship (e.g., how many ppm EG was equal to one COD). DuPont stated that they are very concerned about what their process and changes to it send to the WTP because of potentially adverse effects on the bacteria in the activated sludge.

DuPont noted that they had an emission test run on their cooling towers. They pointed out that during the production process 2-Methyl . 1,3-dioxolane (2M 1,3-D) is formed. This compound will readily hydrolize into EG if exposed to water with any slight degree of pH (+ or -). Thus, the EG emissions from the cooling tower could be from excess EG as well as from hydrolized 2M 1,3-D.

The exchanger columns at the plant have condensers (mostly "spiral" condensers) that recover methanol.

In their calculations, duPont assumed 9 ft^3 of saturated air is emitted. The 9 ft^3 is the amount of purge used on the exchanger columns. DuPont noted that the amount of purge needed is dependent on instrumentation needs, which is the same for each column regardless of column size, and thus is independent of process line production capacity. They pointed out that for this reason the format of the cutoff levels in the proposed standards (which is on a mass VOC per mass production basis) was biased against smaller production lines.

When asked about the use of spray condensers on multiple finishers in the high viscosity production line, duPont stated that they do not use a spray condenser on the last finishers. The single finishers usually are run around 2 to 3 mm of pressure, and thus the end finishers in the multiple end finisher process would be somewhat less than that. When it was pointed out that EPA has been told of difficulties with using a spray condenser on the second finisher in a high viscosity line, duPont indicated that that is true for processes at the Kinston site also.

A brief plant tour was taken in which some of the production vessels were viewed (e.g., exchange columns) along with the spray condensers. In addition, the end of the product line was viewed, beginning with the spinning of the fiber through its packaging into crates or drums.

DuPont agreed to furnish EPA with additional information on the following items:

1. Temperature of the cooling tower water.
2. The relationship between EG concentration and COD.
3. The EG concentration in the cooling tower water.
4. The results of the EG (VOC) emission test on the cooling tower.