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INCORPORATED
WILMINGTON, DELAWARE 19898

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July 24, 1981

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PPD - WASHINGTON WORKS -- TEFLON®
AIR POLLUTION
GROUND LEVEL C-8 CONCENTRATIONS

In your April 24, 1981 letter to me you requested determination of eight-hour time weighted C-8 concentrations that result from emissions from the TFE Building (162) and FEP Building (163). Subsequent to that letter we elected to evaluate both maximum eight-hour and annual mean C-8 concentrations using five years of hourly meteorology for Parkersburg. I examined two cases for the TFE emissions. Case 1 is found in your April 24 letter as "After May Shutdown" and Case 1A is the same as Case 1 except the two dryer vent stacks are 15 ft lower, representing the situation before the stacks were extended.

Superimposed on the TFE dryer vents were C-8 emissions from the FEP area. Basic data for these two vents (wet finishing and coagulator baghouse vents) are summarized in a letter to me from A. R. Behnke dated May 21, 1981. I did not include the blender pit exhaust because C-8 emission is negligible compared to the other sources. As you suggested, I used 50% of the emission rates in A. R. Behnke's letter for this study.

Stack and emission data for both eight-hour and annual mean concentrations are listed in Attachment A (four pages). Meteorology data cover the five-year period from January 1, 1973 to December 31, 1977. Surface data are for Parkersburg and mixing heights from Dayton, OH. Concentrations are computed for each hour and then averaged over eight-hour and annual periods at each receptor (a point in space for which concentration is computed). All eight-hour time weighted averages for the entire five-year period are below the Haskell Laboratory AEL of $10 \mu\text{g}/\text{m}^3$.

Your May 12, 1981 letter to me specified 15 locations for which eight-hour and annual mean concentrations were to be computed. Table 1 is a summary of the highest calculated C-8 concentrations for each of these 15 locations over the five-year period of record for Case 1 and Case 1A. To reiterate, Case 1 represents current stack heights and Case 1A represents stack heights prior to extension of the dryer vent stacks on the TFE Building. The highest calculated eight-hour value is $6.9 \mu\text{g}/\text{m}^3$, at the Butacite Office Building (Case 1A).

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Table 2 is a summary of the highest one-hour concentrations for each receptor location for each of the five years. Although there is no established one-hour limit for C-8, the one-hour values need to be calculated to determine eight-hour and annual mean concentrations.

The highest eight-hour values are summarized in Table 3. None of the values exceeds the AEL of $10 \mu\text{g}/\text{m}^3$. Comparison with Table 1 indicates that maximum eight-hour values are less than half the maximum one-hour values. This is due, of course, to the improbability of identical meteorological conditions persisting from hour to hour.

Annual mean values for each of the five years are summarized in Table 4. There is no annual mean limit for C-8 but annual values at a given location determine long term exposure to C-8 and, as suggested by Paul Thistleton, may be useful in correlating with organic fluoride blood analyses done on selected plant employees.

None of the 15 receptors (except possibly No. 15) is downwind of the prevailing (W to SW) wind direction. For this reason, I have made additional annual mean determinations for a receptor grid of 2400 receptor points located 200 ft apart. Maximum annual values for these runs are summarized in Table 5. As expected, the maximum values are somewhat higher than those determined from the 15 receptor plant network. Concentration contours for 1976, the year which exhibits the highest annual values, are drawn on Figures 1 and 2. The maximum concentrations, as expected, fall to the northeast of the plant.

The highest calculated eight-hour concentrations, for Case 1 and Case 1A, occur at Butacite Office Building on June 4, 1977 from 8:00 AM to 4:00 PM. I have computed concentration contours for this period and have attached them as Figures 3 and 4. These contours represent concentrations at a 2400 point receptor grid with the points 50 ft apart. Meteorological conditions for the critical eight-hour period are listed in Attachment B.

Please note that "ground zero" for all of the concentration plots is a point half way between the dryer stacks. I have only plotted "worst case" conditions; other periods can be easily plotted if you so desire.

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Attach.

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