Monsanto INDUSTRIAL CHEMICALS CO.

FROM (NAME & LOCATION): J. P. Mieure - T2F

DATE : September 18, 1975

SUBJECT : EPA REPORT ON INVESTIGATION OF PCBs IN THE HUDSON RIVER

REFERENCE :

cc: H. S. Bergen - B2SL
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D. Wood - B2SD

TO : W. B. Papageorge
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We have extensively reviewed the subject report and are summarizing our impressions in this memo.

Comparison of the reported PCB content of water, sediment, and biota collected above and below the GE outfalls strongly suggests contamination of the river by PCBs from these outfalls. Concentration increases up to 3000-fold (water), 1000-fold (sediment), 10-fold (shiners), 20-fold (larger fish) and 34-fold (snails) were reported for samples taken downstream compared to the upstream controls. These values represent a statistically significant difference. Coupled with the discharge information from the GE NPDES Permit application (Table 2) there is little doubt that environmentally significant quantities of PCBs have been introduced into the Hudson River by GE.

Comments on pp. 3 and 13 indicate that the only basis for EPA action in this matter is Section 504 of the FWPCA. Since PCBs have not been reported in drinking water of any communities in the area, this basis is limited to demonstrating that the discharge has contaminated food to an extent that presents a health hazard. The report of 350 ppm PCBs in a rock bass caught below the outfalls lends strong support to the contaminated food argument. This value is 70 times the FDA Temporary Tolerance Limit for edible portions of fish (Table 1).

On pp. 11 and 13 the report expresses confusion over whether Aroclor 1016 was identified in biological tissues from the river and what effect this ambiguity might have on enforcement proceedings. The reason for the discrepancy (inexact correspondence of chromatograms from biological extracts with Aroclor 1016 standards) is simple to explain. Individual PCB isomers have different tendencies to accumulate in biological matrices. In general the accumulation tendency is less for homologs with lower chlorine content. As a consequence, a biological extract typically contains relatively less of the lower chlorinated homologs than the PCB to which the organism was exposed. The chromatogram of a biologically altered extract thus may more closely resemble the chromatogram of a higher chlorinated PCB product. This behavior explains the EPA observations noted on pp. 10 and 11. Scientists on EPA's central staff will also recognize this behavior as characteristic of PCBs. In our opinion, the equivocal statements about confirmation of Aroclor 1016 do not represent an exploitable weakness in the report.

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The 17 ppm PCB reported in yellow perch taken from the control point above the plants is a surprisingly high value indicating cause for ecological concern even in the absence of GE's effluents.

Several other comments follow, in order of presentation in the paper.

Several sweeping statements made in the Introduction are incorrect. For example, most PCB homologs containing fewer than five chlorine atoms per molecule are less persistent than DDT. PCBs are alterable by microorganisms - we have observed greater than 90% primary biodegradation of Aroclor 1016. PCBs are alterable by physical-chemical processes such as photodegradation and combustion. Incineration, the recommended method of disposal, is such a process.

The discussion of the 1972 Water Quality Criteria on p. 2 omitted a very important consideration. Apparently, the assumption is made that all ingested PCB is retained by the body tissues and that no depuration occurs. Neither of these assumptions is correct. Lower chlorinated homologs accumulate to a lesser degree and are eliminated more readily than higher chlorinated homologs. Recent unpublished studies by a government laboratory indicate that even for Aroclor 1254, a predominantly pentachlorobiphenyl, depuration in rats occurs with a half-life of 8-12 weeks. Thus, over a period of 70 years, a majority of accumulated PCB would be eliminated from the body. Calculation of tolerances for PCBs in water should take these facts into account.

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