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6 February 1975

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file

Mr. J. R. Smith
Special Studies Staff
Environmental Protection Agency
National Environmental Research Center
Research Triangle Park, North Carolina 27711

Dear Mr. Smith:

I am responding to your request for comments on the External Review Draft dated October 15, 1974, of the Briefing Report on Environmental Aspects of Vinyl/Polyvinyl Chloride. I will use the paragraphing and penciled-in page numbering of that report for reference.

Section 1.1 Summary. Page 1-2. Six percent loss for vinyl chloride monomer during processing is asserted. Later in the report this loss is qualified to the two to three percent level. The later number is more representative of actual conditions and should be used in the summary for internal consistency.

Page 1-3. The first paragraph refers to the availability of technology to reduce monomer emissions from PVC plants by 75 percent. The source of this figure was a preliminary report prepared by OAQPS. I understand that OAQPS has revised its thinking. Seventy-five percent is an average figure from the preliminary study and most likely is not applicable industry-wide.

Page 1-6. The last paragraph refers to monitoring data presented by Dow Chemical on their polymerization plants. It should be pointed out that it is generally conceded that this plant has the lowest exposure of any plant in the United States and that this is not typical of all PVC operations. Several companies testified, as you mention later in the report, that their exposure certainly must have been much higher than this. See, for example, the testimony of Vittone of B. F. Goodrich for the SPI at the OSHA hearings. We agree completely with

AP00027741

Mr. J. R. Smith
6 February 1975
Page Two

the statement made several times in your report that the cases of liver angiosarcoma should be related to long-term and high level exposures.

Page 1-7. I discussed with you and Dr. Brubaker the absolute necessity for accurate information on the so-called community cases. Proper understanding of whether or not these are vinyl chloride induced liver angiosarcoma is absolutely critical to proper action by all of us. Our industry continues to be vexed by the paucity of information and the confusion which surrounds these cases and the manner in which such information is made available. A review of the CDC report of October 9, 1974, EPI-74-104-2 does not reveal any data which can be used in support of a direct relationship between vinyl chloride and the cases discussed.

Page 7-1-7. The report cites a reference that eliminates the General Electric employee as a possible case. Yet this case continues to be carried by NIOSH in its listings. See, for example, Journal of Occupational Medicine, Volume 16, Number 12, Page 809, Case United States 14, and the CDC report mentioned above. EPA can be of great service to all concerned here if you can help establish the factuality of these cases.

Section 1.2 Conclusions. Page 1-10. We would want to emphasize the word "potential" in your first conclusion for the very reasons which I have discussed immediately above. We do not have any concrete evidence at all that any human has been harmed from exposure to vinyl chloride at the levels prevalent outside of work areas.

Table 5-2-2. In Footnote D, the population for Paducah, Kentucky is used erroneously. This city is more than twenty miles away, and the plant is nearest to the town of Calvert City, which has a population of about 3,000.

Section 6. Page 6-1. Again, the best evidence indicates that the TWA exposures in the early occupational history of those who contracted liver angiosarcoma was considerably above 500 ppm. It is my understanding that the ceiling for vinyl chloride was never reduced by OSHA below the 500 ppm, although

AP00027742

Mr. J. R. Smith
6 February 1975
Page Three

It had been so recommended by ACGIH. At the time the temporary emergency standard was promulgated the official OSHA value was still 500 ppm. This comment also applies to page 7-3-20.

Page 7-25. No reference is given to the information on the excreted form of metabolic products. It would be very useful to have this reference, and also the source of the 6-hour photochemical half-life of VCM cited on page 1-11.

Section 7.1.6.2. Page 7-1-28. A section later in the report does discuss the pyrolysis products. These are all well-known compounds whose toxicity are also known.

Page 7-2-7. The standard speaks to a 15-minute ceiling value and not a 5-minute figure as you have in the report. Also, the statements on the "several community cases" deserves the same comment as given earlier.

Page 7-3-14. It is not at all surprising that the Monson study showed a high incidence of cancer in that the study included the plant with the highest number of angiosarcoma cases anywhere in the world. It also excluded the available data from other plants operated by this same company at which there are no angiosarcoma cases.

Page 7-3-22. Union Carbide has submitted additional data to OSHA which indicated that the olfactory level for the vinyl chloride available today is at least 1200 ppm and may well be higher.

Page 7-3-23. It is not appropriate to compare exposures reported at Dow Chemical in 1973 with those from a Swedish plant of a decade earlier; nor can any generalization be made on specific exposures by comparison of extrusion plants in the United States with a cloth coating plant in England. In other words, we don't know what the exposures were for these men and a false impression is implied by the numbers included at this point.

Page 7-3-27. It was specifically stated that the studies of German workers were not based on a random or representative group of men, but specifically

AP00027743

Mr. J. R. Smith
6 February 1975
Page Four

those workers who complained of illnesses. In this light, it is not surprising to find a high percentage of abnormalities.

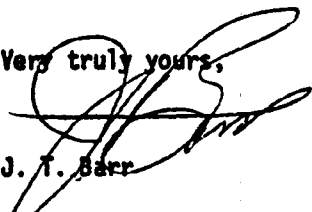
Page 7-3-30. The incidence of abnormalities found in the B. F. Goodrich group of workers is reported to be approximately the same as that found in applicants presenting themselves for employment examinations. Throughout the many studies performed by industry during this time, including our company and Union Carbide among those who have reported data, the incidence of abnormal liver function has not been found to be greatly different amongst exposed employees and those who have not been exposed.

Page 7-3-36. We are concerned about the general bias of the comments on the various reports by companies on the results of their medical examinations. These were presented as the best available data at the time in order to assist in understanding the existing situation. It is not normal to use a control group in reporting such data. The medical protocols which were submitted did explain the parameters used and Air Products, at least, did later submit to OSHA a breakdown of the employees of time since first exposed. However, very little of this entire section bears on the question at hand which is the problem of health hazard to the general populace from very low concentrations of vinyl chloride.

Page 7-5-2. Professor Viola's study reported that animals exposed to 2500 ppm vinyl acetate showed no incidence of cancer. However, the mortality rate was high.

We appreciate the opportunity to submit comments on this report, and I personally appreciate the time which you and other persons at Research Triangle spent with me during my recent visit there. We hope that these comments will be useful to you, and we will be of whatever assistance to you that we can in this matter.

Very truly yours,


J. T. Barr

/dw

bcc: A. R. Adams
T. L. Carey
R. Fleming
J. T. Sebastianelli
W. M. Smith

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Jan 15 '72 C & E News

Letters

1975

① EPA File
② JTBar YOUR MR. ALTSHULLER
Power plant plume chemistry

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John - we might wish to inTBO duey ourselves
To the U. of Md. Group

SIR: I would like to make several comments in reply to the letter submitted by A. P. Altshuller of the Environmental Protection Agency (C&EN, Dec. 9, 1974, page 3).

As a spokesman for one of our most important control agencies, Altshuller's presentation of misleading facts, his misrepresentation of our work and his premature judgments regarding the problem of power plant plume chemistry leave much to be desired. Unfortunately, Altshuller selected a C&EN article to criticize, rather than our papers, published in professional journals such as *Science* and the *International Journal of Chemical Kinetics*.

Altshuller should be very much aware of the fact that the University of Maryland group in all published papers in professional journals and at scientific meetings where I, as principal investigator, have spoken (one of which was attended by Dr. Altshuller himself), has mentioned both hydrocarbon and HSO chemistry as possible explanations for the observed ozone bulge. Our only strong position has been taken with regard to the observed fact that power plants do generate ozone clouds far downwind during summertime conditions and that this ozone cannot be the result of hydrocarbons emitted by the power plants themselves. The level of hydrocarbons produced from power plants is far too low at 15 to 20 miles downwind from the plant to explain the observed ozone buildup (a buildup which has reached levels as high as 40 ppb above ambient, not 25, as quoted by Altshuller).

Concerning reactive hydrocarbons from the incoming ambient air, we have taken the scientific position that not enough data are presently available at 2000 or 3000 feet above ground level in nonurban air to provide convincing proof of its importance. Altshuller's numbers of 50 to 100 micrograms per cu m of air mean very little unless the hydrocarbons can be clearly identified as of the reactive type.

I think that the viewpoint of the University of Maryland group on this newly identified phenomenon is one that is shared by most of the scientific community—more facts are needed. To this end the Maryland group has now spent several months setting up instrumentation for carrying out detailed hydrocarbon analysis of ambient air upwind of large nonurban power plants. We also are continuing our effort to measure the first rate constants for several of the HSO_x species and to determine reliable chemical lifetimes for SO₂ using a newly developed aircraft-compatible laser probe.

Finally, an extensive cooperative program with other groups in the state is being set up to systematically examine the full dimensions of power-plant-generated

ozone, nitric acid formation, and sulfuric acid aerosol formation. (All of the above research is taking place without funding from Altshuller.) The approach we are taking, therefore, is one of collecting more scientific data and letting the facts finally answer the question rather than decreasing the answer from preconceived ideas.

For too long now decisions on environmental control strategies have been made with only the minimal scientific base. This, in many cases, has proven very costly to industry and to the general public. A move in the right direction may be more independent research in the environmental field with all scientifically significant ideas being explored and taken to their logical conclusions.

Douglas D. Davis
Chemistry Department, University of Maryland, College Park

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R. FLEMING, V. F.

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