The Vinyl Institute

A Business Unit of The Society of the Plastics Industry, Inc.

March 1, 1999

Via **Facsimile**
Elizabeth Laplante
Frank R. Anscombe
Region 5, U.S. Environmental Protection Agency
Mail Code G-17J
77 West Jackson Boulevard
Chicago, IL 60604-3507

Re: SPI Vinyl Institute; Comments on Draft Great Lakes Binational Toxics Strategy Octachlorostyrene Report: A Review of Potential Sources

Dear Ms. Laplante and Mr. Anscombe:

Please find enclosed comments of the Vinyl Institute, a business unit of The Society of the Plastics Industry, Inc. (SPI), on the U.S. Environmental Protection Agency's (EPA) *Draft Great Lakes Binational Toxics Strategy Octachlorostyrene (OCS) Report: A Review ofPotential Sources.* 63 *Fed Reg.* 72,311 (1998).

Members of the VI are responsible for the majority of the domestic production volume of ethylene dichloride (EDC), vinyl chloride monomer (VCM) and polyvinyl chloride (PVC). Consequently, VI is responding to the suggestion that technologies employed by the vinyl industry or its products ultimately produce octachlorostyrene, an industrial byproduct that is viewed as a persistent bioaccumulative toxic (PBT) contaminant that poses a threat to the Great Lakes Basin environment. As discussed in the comments, for a number of reasons, the VI does not believe that the vinyl industry has any real impact on the Great Lakes Basin.

Again, the VI appreciates the opportunity to comment on the Draft OCS Report, and would be pleased to further discuss its analyses with you. Please do not hesitate to contact us if you have any questions.

Sincerely,

Frank E. Borrelli/PLD

Frank E. Borrelli
Technical Director

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Enclosure

cc: William F. Carroll, Jr., OxyChem
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COMMENTS OF THE SPI VINYL INSTITUTE

The Vinyl Institute (VI), a business unit of The Society of the Plastics Industry, Inc. (SPI), is pleased to provide comments on the December 22, *1998, Draft Great Lakes Binational Toxics Strategy Octachlorostyrene (OCS) Report: A Review of Potential Sources.* Specifically, the VI is responding to the suggestion that technologies employed by the vinyl industry or its products ultimately produce octachlorostyrene (OCS), an industrial byproduct that is viewed as a persistent bioaccumulative toxic (PBT) contaminant that poses a threat to the Great Lakes Basin environment. The text of our suggested comments follows.

The Vinyl Institute (VI), a business unit of The Society of the Plastics Industry, Inc. (SPI), supports the Environmental Protection Agency's (EPA) efforts to study and evaluate the effects of PBT's and other substances on the Great Lakes Basin. We understand that EPA has committed under the Great Lakes Binational Toxics Strategy to confirm that OCS is no longer used or released from sources that effect the Great Lakes Basin. While we recognize the origins of this task, we note at the outset the difficulty of proving a negative in an absolute sense. Thus, we assume that EPA's real task is to provide reasonable assurance that OCS is not intentionally used or released.

The draft OCS Report hypothesizes that OCS may arise from the production of ethylene dichloride (EDC), vinyl chloride monomer (VCM), and polyvinyl chloride (PVC) in three ways. First, the report identifies as "highly probable sources" of OCS the free radical pyrolysis of EDC to yield VCM, and the free radical initiated VCM polymerization process for the manufacture of PVC. Second, the report suggests that because OCS can be found in processes involving chlorine at high temperatures, the incineration of PVC can produce OCS. Finally, EPA asserts that whenever hexachl.orobenzene (HCB) is formed, the potential to form OCS exists.

The VI does not believe that the vinyl industry has any real impact on the Great Lakes Basin as it relates to OCS because:

- The EDC/VCM/PVC industry is located primarily outside the Great Lakes Basin;
- Existing control technologies would minimize any emissions of OCS that might be formed in the EDC/VCM manufacturing process;
- There is no reason to believe that any perchlorinated species can be created in VC polymerization;
- PVC disposal and incineration should not be a source of OCS; and
- Even a worst case analysis shows that the EDC/VCM/PVC industry would be a negligible source of OCS.

A. The EDC/VCM/PVC Industry is Located Primarily Outside the Great Lakes Basin

Members of VI are responsible for the majority of the domestic production volume of EDC, VCM, and PVC.[1] However, the vinyl industry has a limited presence in the Great Lakes Basin. All production of EDC and VCM in the U.S. occurs in Kentucky, Louisiana, and Texas. EPA itself acknowledges that there are no EDC/VCM production facilities in the Great Lakes Basin. Report at 53. In addition, more than 90 percent of U.S. PVC production occurs outside of the Great Lakes states. Indeed, the report only identifies a single location for PVC polymerization in the Great Lakes Basin. Report at 54.

EPA is also considering the potential for atmospheric deposition to be a source of OCS contamination in the Great Lakes Basin. However, EDC, VCM, and PVC production facilities are geographically located such that atmospheric deposition in the Great Lakes is so unlikely that it is reasonable to conclude that the industry is not a source of OCS in the Great Lakes region. This conclusion is supported by the history of OCS contamination in Lake Ontario sediments and in Lake Ontario trout. The report reflects decreasing OCS levels, approaching the near-zero level between 1921 and 1981. Report at 20. Similarly, concentrations of OCS in trout declined from 263 nanograms per gram in 1977 to 31.3 ng/g in 1993. During these periods of declining OCS releases to the environment, U.S. production of EDC, VCM, and PVC increased substantially to more than 25, 13, and 12 billion pounds a year, respectively. If the EDC/VCM/PVC industry was a source of OCS in the Great Lakes Basin, this would have been reflected in actual monitoring data.

B. Existing Control Technologies Would Minimize Any Emissions of OCS That Might Be Formed in the EDC/VCM Manufacturing Process

As acknowledged in the report, OCS is not deliberately manufactured, and the vinyl industry does not use OCS in any form. Further, based on knowledge and experience, any OCS that is unintentionally manufactured would be captured in the EDC or VCM purification process and/or emission control devices, which are strictly regulated under the Clean Air Act (CAA), Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA) to control emissions of hazardous air pollutants and other substances. As the OCS Report itself notes that "[t]here are no emissions released directly to the atmosphere [from EDC and VCM production facilities], as regulations require emission sources to be enclosed and all emissions to be collected." Report at 41 (emphasis added).

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[1]VI's members include: Borden Chemicals and Plastics Limited Partnership, CertainTeed Corporation, CONDEA-Vista Company, The Dow Chemical Company, Formosa Plastics U.S.A., The Geon Company, Georgia Gulf Corporation, Kaneka Delaware Corporation, Occidental Chemical Corporation, PPG Industries, Inc., Shintech, Inc., Union Carbide Chemicals and Plastics, and Westlake PVC Corporation.

As the report notes, gaseous streams are treated by incineration and liquid streams and wastewater are stripped of trace organics. In this regard, it is also important to note that incineration at EDC/VCM facilities, as well as PVC production facilities, is highly regulated and subject to continuous emissions monitoring. The incinerator operating parameters at these facilities provide a high degree of assurance. Further, the trace organics stripped from wastewater are typically routed back into the production process or to a well-controlled incinerator. Overall, OCS emissions are not a concern.

3 C. There Is No Reason to Believe That Any Perchlorinated Species Can Be Created in VC Polymerization

The VI has no data showing that OCS is formed during the polymerization of VCM. Although the report is not clear in this regard, it appears that EPA's speculation that PVC production is a source of OCS stems from an assumption that OCS is formed when polychlorinated dibenzo-*p*-dioxins and furans (PCDD/F, or "dioxin") are formed, and that dioxin is formed during the polymerization of vinyl chloride. The VI does not believe that dioxin is formed during the polymerization process, and this conclusion is supported by the findings in the Vinyl Institute Dioxin Characterization Program Phase I Report (August 1998), which was previously submitted to EPA.

The OCS Report states that the formation of OCS in the PVC polymerization process "is not certain." From a chemistry perspective, we have no reason to believe that any perchlorinated species are created in the vinyl chloride polymerization process. Thus, the report's conclusion should be revised to state that OCS is not predicted to be formed during the polymerization process.

4 D. PVC Disposal and Incineration Should Not Be a Source of OCS

The OCS Report suggests that PVC products that are land-disposed rather than recycled or incinerated can be potential sources of OCS if accidental landfill fires occur. At the same time, the report indicates that all incineration processes involving chlorinated substances should be expected to form OCS. Studies on dioxin emission from commercial incineration systems indicate that the control of combustion conditions is the most effective way to minimize dioxin emissions.[2] It is reasonable to conclude that this technology would also be effective in the mitigation of OCS emissions. Further, modem landfill management practices mitigate the potential for landfill fires.

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[2] *See, e.g.,* "The Relationship Between Chlorine in Waste Streams and Dioxin Emissions From Waste Combustor Stacks," H. Gregor Rigo, *et al.,* American Society of Mechanical Engineers (1995).

E. Even a Worst Case Analysis Shows that the EDC/VCM/PVC Industry Would be a Negligible Source of OCS

Because the industry has little or no releases of OCS, the VI has not developed data on emissions of OCS from the vinyl manufacturing process. However, a worst case estimate can be constructed based on industry data and the OCS/dioxin ratio presented in the report. Please note that we have no basis to support the ratio factor of 653 for OCS to dioxin described in the report[3] Report at A-4. We use that figure here only to support the conclusion that the report should state that the vinyl industry is not a source of OCS.

If we assume that a relationship between the formation of dioxin and the formation of OCS in the EDC/VCM/PVC process exists, we can begin by basing an emissions estimate for OCS on dioxin emissions. In its August 1998, Dioxin Characterization Phase I Report, the vinyl industry indicated that the only potential release points of dioxin in the PVC manufacturing process were the incineration of the vinyl chloride recovery process vent, emissions from the polymer dryers, and wastewater. The recovery, process vent is regulated under the CAA's National Emission Standards for Hazardous Air Pollutant Emissions (NESHAP) to comply with a 10 parts per million (ppm) VCM emission limit in the vent stream.[4] For EDC/VCM production, dioxins were found in emissions from the process vent incinerators and wastewater, which are also regulated.

The report should note that the production of 12.5 billion pounds of PVC and 13.6 billion pounds of VCM from 25.5 billion pounds of EDC per year generates less than 31.3 grams on a Toxic Equivalent (TEQ) basis per year of dioxins to air and less than 0.22 grams TEQ/year of dioxins to water. As noted above, although we have no basis to support the ratio factor of 653 for OCS to dioxin that is described in the OCS Report, OCS emissions based on the suggested ratio of OCS concentrations to dioxin emissions can be estimated. Applying the ratio factor, total U.S. EDC/VCM/PVC production would emit less than 20.4 kilograms per year (kg/y) of OCS to the air and less than 0. 143 kg/y of OCS to water. In addition, these would be total national release numbers and would not reflect actual releases or deposition in the Great Lakes basin. The VI study found that over 98 percent of estimated dioxin releases originated from facilities that manufacture EDC/VCM or EDC/VCM/PVC, which, as noted above, are not located in the Great Lakes region. In sum, given EPA's estimate of 4,157 pounds (1,890 kg) per year emissions of OCS, the calculated worst case for the EDC/VCM/PVC industry contribution is so small as to be inconsequential.

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[3] The lack of an asserted correlation between a specific dioxin/furan congener and OCS adds further uncertainty to the OCS/dioxin ratio. This is particularly important since the small amounts of dioxin and furans produced in the EDC/VCM manufacturing process predominantly are the more highly chlorinated, less toxic species, such as octachlorodibenzo-p-dioxin.

[4] C.F.R. § 61.60 *et. seq.*

F. Conclusion

The Vinyl Institute does not believe that its industry has any real impact on the Great Lakes Basin as it relates to OCS because:

- The EDC/VCM/PVC industry is located primarily outside the Great Lakes Basin;
- Existing control technologies would minimize any emissions of OCS that might be formed in the EDC/VCM manufacturing process;
- There is no reason to believe that any perchlorinated species can be created in VC polymerization;
- PVC disposal and incineration should not be a source of OCS; and
- Even a worst case analysis shows that the EDC/VCM/PVC industry would be a negligible source of OCS.

The VI does not support the draft report's conclusions with regard to the vinyl industry and asks that they be revised to be consistent with these comments.