Photo: The Anglers' Club "Bulletin"—Robert Warner

SALMON FISHING in some rivers is perilled by levels of PCBs that exceed limits set by FDA.

PCBs: problem for all parties

They're spreading in environment despite Monsanto's cutbacks; EPA says toxic substances bill needed for effective control

Chemical companies, electrical equipment makers and government regulatory agencies are frustrated over polychlorinated biphenyls. So far no viable substitutes have been found for the nonflammable heat-transfer fluid. But, although the sole U.S. manufacturer, Monsanto, has restricted use of the chemical to closed systems, such as transformers and capacitors, more of it is appearing in the environment, and regulatory agencies say they have no tools to control its spread.

The frustrations spilled over at the Environmental Protection Agency meeting on PCBs in Chicago recently (*CW Technology Newsletter, Nov. 26*). EPA reported that some 10 million lbs. of the chemical are "lost into the environment each year through vaporization, leaks and spills." But EPA Administrator Russell Train said he was reluctant to ban PCB discharges under Section 504 of the 1972 Federal Water Pollution Control Act Amendments, but could go along with a 1-part/trillion water-quality limit. Train indicated that PCB discharges could be controlled only after passage of toxic substances control legislation now pending in Congress.

Stressing the impact of PCB spills on fish, Nathaniel P. Reed, an Assistant Secretary of the Interior Dept., said the nation's rivers and lakes were "in mortal danger," with levels in fish in excess of the Food and Drug Administration's 5-ppm. limit "virtually everywhere." Reed's solution: limit PCBs to transformers and capacitors. But Monsanto has already done that.

And the frustrated electrical equipment industry hasn't been able to find a substitute with the all-round coating, heat-transfer and fire-resistance properties of PCB. Dow thinks it's on the right track with its alkylated chlorobiphenyl oxide (*CW, June 25, p. 43*), which will get a big boost this week when McGraw-Edison (Elgin, Ill.), one of the major electrical equipment makers, says that it will switch to the Dow product for some of its capacitors.

No Authority: "We find ourselves without the authority we need to really cope with the problems posed by PCBs," said Train.

And Walter C. Barber, EPA's Director of Standards and Regulations Evaluation, expressed doubt that even tough PCB effluent standards—expected to be drafted sometime this spring—can be effectively enforced because of the "apparent myriad" of small sources of PCB discharges.

A study reported by EPA chemist Thomas Kopp indicated that at least 10 electrical equipment plants were discharging PCBs directly into waterways and that two others were discharging the chemical into municipal waste treatment systems.

In Canada, where the PCB limit in foodstuffs is 2 ppm., officials have reported an average level of over 17 ppm. in eels from the St. Lawrence, over 4 ppm. in smelt and about 2.3 ppm. in sturgeon from the river. Striped bass and salmon caught in the Hudson River and Lake Ontario had PCB levels of over 5 ppm., which leads New York's Environmental Conservation Commissioner, Ogden Reid, to warn against eating Hudson River fish.

"Under present conditions, PCBs may very well pull the rug out from beneath us by destroying marginal species in spite of our best efforts for preservation," said Interior's Reed.

Persistent and Resistant: "The thing that makes these products fire retardant is the same thing that makes them persistent," says Monsanto.

F.W. Kutz and S. C. Strassman of EPA noted an apparent increase in the percentage of people in the U.S. whose tissues had trace levels of PCBs between 1972 and 1974. They reported PCBs were found in 50.6% of the general U.S. population sampled (1,047 samples). Between 1 and 3 ppm. were found in 35.4% of the samples, and more than 3 ppm. in 4.9% of the samples.

But a key problem seems to be that no one is sure why PCBs are increasing in the environment with the production down (40 million lbs./year) and use limited. Surveys by the Michigan Dept. of Natural Resources—which has urged a ban on all but dielectric use of PCBs—failed to identify any electrical applications as major sources of water contamination.

The Michigan study found plasticizer applications, including paper recycling, and municipal sludge in landfills, from which the PCBs may be transported by air, as possible important sources. The report cited hydraulic fluids as an important past source and noted that although all known users of PCBs for hydraulic fluids have switched to substitutes, they continue to have PCB contamination.

Substitute Search: Chemical companies are still searching for PCB substitutes for electrical applications. Monsanto is joining in the search but feels PCBs are indispensable for all dielectric uses.

But McGraw-Edison appears to be satisfied with Dow's research on its heat-transfer chemical, although its use appears to be limited to capacitors. Other chemicals being tested for capacitors: diisononyl phthalate from Exxon Chemical and dichlorobiphenyl plus its alkyl derivative from France's Prodelec S.A. And for transformers, Dow Corning's polydimethyl siloxane is being readied.