Acushnet River contamination cited

PCBs: indestructible environment intruders

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In industry they were long valued for their high degree of stability and low flammability, properties which made them suited for a wide variety of commercial uses.

In the environment, however, these same properties have combined to make them persistent, non-destructible intruders into the ecological mish-mash.

Polychlorinated biphenyls, better known as PCBs, are one of the latest targets of discovery in the chemical field, changing to the forefront as a result of disclosures that the liquid compounds, once thought to be relatively harmless, do indeed pose a threat to health and the environment.

The PCB problem was brought into sharper focus last week when the U.S. Environmental Protection Agency (EPA) released data of test findings of the Acushnet River which it said showed alarmingly high levels of PCB contamination in the waters and shellfish.

An expected meeting between city and federal and state environmental officials later this week is expected to map plans to deal with the problem.

This has come about as a result of monitorings we have taken since last January," Paul Keough, EPA public affairs director in Boston, said. "We consider it a serious problem."

Keough said tests of shellfish taken from the river in late August yielded "the highest" levels of PCB contamination found in shellfish testing in the country to date and produced "among the highest" PCB readings on sediment samples taken from the river earlier this year.

PCBs are relatively colorless and odorless, syrupy liquids derived from a number of different, but closely-related chlorine-based compounds. First developed commercially in 1930, PCBs were on the market for more than 35 years before suspicions arose over their persistency in the environment.

In addition to their current restricted use in the manufacture of capacitors and transformers in the electrical industry, they have also been used in the past as additives for plastics, paints and rubber, in heat transferring equipment and in the manufacture of carbonless copying paper.

The first indication that PCBs might pose environmental hazards occurred in 1966, when scientists observed the presence of the compounds in fish and wildlife samples taken from Swedish waters in analysis for hydrocarbon pesticide residues.

Adverse human effects were first reported two years later when a severe form of skin disorder, later labeled the "Yusho syndrome," developed in Japanese families who had ingested rice oil contaminated by a Japanese-made PCB, Kanechlor 400. The rice oil became contaminated by PCBs and related chemicals during processing and affected more than 1,000 Japanese.

Symptoms included the swelling of the upper eyelids, visual impairment, acne-like formations on the skin and heightened skin pigmentation. Patients with the disease also exhibited neurological disorders and signs of hearing loss. In some instances babies born to several of the parents were stillborn and had traces of the disease, although PCB levels were lower than their parents.



PCB STRUCTURE — The chemical structure of PCBs, polychlorinated biphenyls, is shown here in this diagram. PCBs is a generic term used for a number of synthetic chlorine-based organic compounds with different percentages of chlorinated formations.

Monitorings of the patients also showed that the PCB traces remained in their bodies for long periods of time.

Subsequent tests on monkeys conducted by the University of Wisconsin School of Medicine and tests of rats at the Center for Disease Control in Atlanta, Ga., showed marked reproductive failures in the monkeys and gave some indication that the compounds were carcinogenic as a result of tests on the rats.

The rising concern posed by the use of PCBs on the marketplace produced a voluntary decision by the Monsanto Co., of St. Louis, the sole U.S. manufacturer of the product, to restrict sales after September, 1970 to those purchasers who earmarked the materials for use in closed electrical systems.

Voluntarily restricted production after 1970 when we were able to confirm the products were persistent in the environment," Daniel Bishop, director of public relations for Monsanto's industrial chemical branch told The Standard-Times in a telephone interview last week. Bishop said Monsanto also now has plans to phase out all production of PCBs "By the end of 1977."

Monsanto produces Aroclor, one of eight different PCB trade names produced in the world.

According to Bishop, Monsanto produced about 40,000,000 pounds of the product prior to 1970. Last year, he said, the production was about 37,000,000 pounds. This yearit should be less than 35,000,000 and will drop to 15,000,000 in 1977, the target date for discontinuance of production.

The United States also imports about 200,000 pounds of PCBs annually from foreign companies without tax restrictions, Bishop said.

One of the biggest non-electrical uses of PCBs prior to 1970, according to Bishop, was its use in the manufacture of carbonless copying paper. He also confirmed that the chemical compound was also used as an additive in industrial paints, such as marine paints.

They helped impart stability and weatherproofing," he said.

Although Monsanto has not been involved in research for PCB substitutes, Bishop noted that the electrical industry has and is optimistic that replacement candidates will be proven environmental sound in the next 12 to 18 months.

The two New Bedford companies which have used PCBs, Aerovox Industries Inc. and Cornell Dubilier Electric Corp., have used them in the production of capacitors and transformers.

A spokesman for Cornell Dubilier, George Alexander, industrial relations manager, said his firm won't comment further on the PCB problem until it has examined the results of the EPA findings.

A spokesman for Aerovox, Clifford H. Tuttle Jr., president, said his would comment further once the findings were received, but noted in the interim, Aerovox objected to being labeled a polluter.

Tuttle noted that his firm, which took over the Aerovox Corp. late in 1972, for only been in operation for three years and since months and that PCB accumulation in the Acushnet River was a long-term proposition. Tuttle also noted that results of tests on sources and PCB-based paints formerly used on fishing boats contributed to the problem.

Keough, from the EPA, said the EPA test findings would represent a long term accumulation of PCBs.

Tests from three hard-shell clams taken from ½ mile to 1 mile of the Aerovox discharge outfall contained PCB concentrations of 21-53 parts per million (ppm). The federal interim standard for fish, shellfish and poultry is 5 ppm.

The EPA official said that earlier tests of harbor and river waters yielded sediment samples with very high PCB concentrations. The federal government does not have a standard for sediments.

Keough said a sediment sample taken near the Aerovox discharge point calculated a 600 ppm concentration of PCBs. Another sample taken downstream from the Cornell Dubilier discharge point registered 163 ppm, according to Keough.

Tests conducted at the New Bedford sewage treatment plant outfall and at the former city outfall registered 3 ppm and .5 ppm respectively. Tests of sludge at the New Bedford sewage treatment plant showed PCB levels of 72.5 ppm.

Tests at the New Bedford Landfill site where the EPA dug four monitoring wells on the outskirts of the landfill registered 1 part per billion (ppb) and 10 parts per billion in leachate. A sediment sample of a PCB disposal area recorded 7,000 parts per billion, Keough said.

The EPA has also taken samples of fish from the river for analysis in Minnesota, but final results are not available yet.

PCB Monitoring In New Bedford

Sample Qualogs	Date Taken August	Location	PCB's	Federal Standard
		1/8 to mile Aerovox discharge	21-53 ppm	5 ppm
Sediment	May	Aerovox discharge	600 ppm	none
Sediment	May	500 meters Cornell Dubilier discharge	163	none
Sediment	March	sewage treatment discharge	3-3 ppm	none
Sediment and leachate	April	N.B. landfill	7,000 ppb 1-10 ppb	none

Figures come from the U.S. Environmental Protection Agency in parts per million and parts per billion.

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