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FEASIBILITY STUDY FOR THE
DISPOSAL OF PCBS IN THE SLUDGE
AT THE RALSTON STREET LAGOON

GARY, INDIANA

background

Treatment plant influent and effluent have been tested for PCBs every six months for the past two years. These tests have showed no detectable PCBs. This indicates that the quantity of PCBs in the Lagoon is not increasing.

GENERAL INFORMATION CONCERNING PCBs

The term PCB is short for Polychlorinated biphenyl. PCBs belong to a board family of organic chemicals known as chlorinated hydrocarbons. PCBs are produced by attaching one or more chlorine atoms to a biphenyl molecule. Virtually all PCBs in existence today have been synthetically manufactured. The PCBs in sludge at the Ralston Street Lagoon originated from industrial sources.

Monsanto Corporation was the principal domestic manufacturer of PCBs for use as a dielectric fluid in electrical equipment and heat transfer equipment. They began production of PCBs in 1935. In 1971, Monsanto voluntarily ceased all sales of PCBs for all uses except certain electrical transformer and capacitor uses. In 1977, they voluntarily ceased production because of the wide spread environmental concerns about PCBs.

PCBs are currently being inadvertently produced as process impurities and byproducts during the production of certain organic chemicals. PCBs can be formed as byproducts when chlorine, carbon, elevated temperatures or catalysts are present together in a process.

Monsanto, the principal domestic producer of PCBs, sold PCBs under the trade name "Aroclor." However, companies who used PCBs in the manufacture of transformers and capacitors, and for other uses, often used other trade names. Common trade names for PCBs include:

Aroclor	Chlorphen	Interteen
Aroclor B	Diaclor	No-Flamol
Abestol	Dykanol	Pyranol
Askarel*	Elemex	Pyroclor
Chlorextol	Eucarel	Saf-T-Kuhl
Chlorinol	Hyvol	Sanotherm

*Askarel is also the generic name used for non-flammable insulating liquid in transformers and capacitors.

"Askarel" PCBs are chemical mixtures containing many different PCB congeners. They have a heavy, liquid, oil-like consistency, and weigh 10-12 pounds per gallon. They are very stable, exhibit low water solubility, low vapor pressure, low flammability, high heat capacity, low electrical conductivity, and have a favorable dielectric content.

When PCBs were intentionally manufactured as dielectric as fluid, they were often mixed with certain organic solvents, such as chlorinated benzenes. Thus, the dielectric fluids present in electrical equipment containing PCBs is not, in general, 100 percent PCB. The presence of these other chemicals influences the physical/chemical properties of the Askarel fluid.

Same site

PCBs that are produced as by-products and process impurities may vary from a single isomer to a variety of congeners and display different physical and chemical properties depending upon the number of isomers and the degree of chlorination (the number of chlorine atoms attached to the biophenyl molecule). PCBs with fewer chlorine atoms are, in general, less persistent, more water soluble, and more flammable than PCBs with more chlorine atoms.

The primary use of PCBs has been electrical equipment and in hydraulic fluids in equipment in foundaries and steel mills. The majority of PCBs marketed in the United States are still in service, primarily in electrical equipment.

PCBs can also be present as by-products in many different organic solvents and other chemicals.

PCBs are harmful because, once released in the environment, they do not break apart into new chemical arrangements. However, PCBs with fewer chlorine atoms are generally less persistent and display less of a tendancy to bioconcentrate and bioaccumulate. Instead, they persist, bioaccumulate and bioconcentrate in organisms. The EPA has concluded that PCBs are toxic

and persistent. PCBs cause chloracne (a painful, disfiguring skin illness), and the EPA has found, based on animal data, that reproductive effects, developmental toxicity, and oncogenicity are areas of concern to humans exposed to PCBs. It also has been demonstrated that PCBs are toxic to fish at very low levels of exposure. The survival rate and the reproductive success of fish can be adversely affected in the presence of PCBs.

REGULATIONS CONCERNING PCBs

In 1976, Congress enacted the Toxic Substances Control Act (TSCA), which directed the EPA to control the manufacture, processing, distribution in commerce, use, disposal, and marking of PCBs. Section 6(e) of TSCA requires proper disposal of PCBs, and prohibits the manufacture, processing, distribution in commerce, and use of PCBs.

Final Marking and Disposal Rules appeared in the Federal Register on February 17, 1978 (clarifying amendments to this Rule appeared in the August 2, 1979, Federal Register).

On June 7, 1978, the Proposed PCB Ban Rule appeared in the Federal Register. The Final PCB Ban Rule appeared in the Federal Register on May 31, 1979 (44 FR 31514); this Rule superseded the February 17, 1978, Marking and Disposal Rule, and included provisions banning the manufacture, processing, distribution in commerce, and use of PCBs. The May 1979 Rule took effect on July 2, 1979.

The Environmental Defense Fund (EDF) challenged several provisions of the May 1979 Rule, and in October of 1980 the U.S. Court of Appeals for the District of Columbia Circuit ruled that there was insufficient evidence in the record to support several provisions of the May 1979 Rule. Specifically, the Court struck down the classification of transformers, capacitors, and electromagnets as "totally enclosed", and the regulatory cuttoff at 50 ppm for the manufacture, processing, distribution in commerce, and use of PCBs. All other provisions of the May 1979 Rule remain in effect.