Housatonic River SAMPLER

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New England Region
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IN THIS ISSUE...

Welcome to the first issue of the Housatonic River Sampler, which brings you news of progress on the GE/Housatonic River Site.

Contents

Cleanup of 1/2-Mile Reach Nears Completion

Riverbank Restoration in 1/2-Mile Reach

General Electric Company (GE) is nearing completion of the Upper 1/2-Mile Reach Removal Action, which was initiated in October 1999. The project work plan called for removing about 8,000 cubic yards (yd^3) of sediment and 4,000 yd^3 of riverbank soils from the upper 1/2-mile reach, the section of river between the Newell Street and Lyman Street bridges in Pittsfield, Massachusetts.

The removal and restoration process for the 1/2-mile reach involves the following stages:

- Diverting the river around a work cell formed by installing steel sheetpiling.
- Pumping water from the cell to a treatment plant so that work can proceed "in the dry."
- Removing sediment, typically to a depth of 1.5 to 4 feet, and constructing a multi-layered engineered cap.
- Excavating the riverbank to a depth of as much as 3 feet to meet cleanup standards.
- Adding habitat enhancement structures and revegetating the riverbanks.

The project is about 80% complete and should be finished in summer 2002, despite schedule delays caused by flood events and the discovery of large quantities of oil or non-aqueous-phase liquids (NAPLs), oily substances that do not mix readily with or dissolve in water. During the excavation process, nine separate occurrences of NAPL were found, which have required significant additional work for sampling, excavating NAPL-contaminated sediments, and installing sheetpiling to reduce the potential of NAPL seeping into the river.

To date, approximately 8,200 yd^3 of sediments and about 5,600 yd^3 of riverbank soils have been excavated from the 1/2-mile reach. GE has treated over 140 million gallons of water from the excavation areas.

EPA Moves Forward on Implementing 1 1/2-Mile Reach Removal Action

Excavation in Progress Within Typical Sheetpile Cell

In November 2001, the U.S. Environmental Protection Agency (EPA) completed the design of the first phase of the 1 1/2-Mile Reach Removal Action for the Housatonic River. The first phase includes a 1,400-foot stretch of the river starting at the Lyman Street Bridge and extending to a point upstream of the Elm Street Bridge. The design, which was completed in conjunction with the U.S. Army Corps of Engineers (USACE) and their contractor, Roy F. Weston, Inc., uses a river cleanup method similar to that being employed by GE on the upper 1/2-mile reach. Cleanup activities in the 1 1/2-mile reach, which are being performed by EPA, will begin upon GE's completion of work in the upper 1/2-mile reach, currently scheduled for summer 2002.

Construction, Cleanup, and Restoration Process — Sheetpile cells will be constructed to temporarily divert river flow, and the riverbanks and riverbed will be excavated, backfilled, and replanted within each cell. Contaminated material will be stockpiled temporarily at the GE facility and later placed in the GE On-Plant Consolidation Areas (OPCAs).

Process Tailored To Minimize Impacts on the Community — The construction process has been tailored to minimize impacts on residences, businesses, and streets adjacent to the river. Truck routing has been designed to avoid the use of neighborhood roads as much as possible. During the design process, EPA met with affected property owners to inform them of construction impacts and to address their concerns. In addition, EPA and USACE are proceeding with acquiring the necessary construction easements and providing compensation to affected property owners. EPA will continue to coordinate with these property owners throughout the cleanup process and continue to minimize the impact to property owners and the adjacent community whenever practical.

Techniques To Minimize Impacts on the River — During the design process, EPA used state-of-the-art hydrologic modeling techniques to assess the potential impacts of the temporary sheetpile cells on the river levels. The resulting river diversion design minimizes the potential downstream migration of river sediment by allowing controlled flooding of sheetpile cells during storm events. Restoration of the riverbanks and riverbed after excavation was designed with input from the Natural Resource Trustees and national experts. The restored riverbed and banks are expected to provide enhanced habitat for animals and native plants.

PEDA and Redevelopment of the GE Site

The Pittsfield Economic Development Authority (PEDA) is charged with planning and implementing the redevelopment of a portion of the GE site that will be remediated and turned over to PEDA. The focus of PEDA's redevelopment efforts is a 52-acre parcel that is part of the area defined by EPA as the "GE Plant Site."

Because Pittsfield is the largest city in Berkshire County, its economic success strongly affects the economy of the entire region. For most of the past century, the economy of Pittsfield has been linked to the operations of GE. Since a good portion of GE's operations have been dormant for many years, the City of Pittsfield and PEDA are working hard to reuse the GE property and bring new jobs to the region. As part of the agreements finalized in 2000, GE has agreed to demolish existing buildings on a portion of their property, clean the area, construct new buildings, and turn the property over to PEDA.

To assist PEDA in redeveloping the property, EPA recently entered into a Prospective Purchaser Agreement with PEDA. The Agreement assures PEDA that owning the GE Plant Site will not make PEDA liable for the existing contamination. In executing the Agreement, EPA worked hard to address PEDA's specific concerns about potential liability. This site is regarded as an unparalleled opportunity for the City of Pittsfield and the surrounding region. PEDA envisions the site as a commercial and industrial area to complement the retail, office, and service sectors that are concentrated in downtown Pittsfield just a mile away.

For more information regarding the Definitive Economic Development Agreement and the Prospective Purchaser Agreement, see ***www.epa.gov/ne/ge/redevelopment.html*** .

EPA's Community Interaction

As part of EPA's commitment to community involvement, EPA participates in various activities to provide the public with information about the progress of GE/ Housatonic River environmental studies and cleanup activities. For example, EPA, MDEP, and GE representatives participate in Citizens Coordinating Council (CCC) meetings. The following article presents another example of EPA's community involvement activities.

St. Joseph's High School Students Learn about PCBs, See Demos of Sampling Equipment

Students and their advisors from St. Joseph's High School in Pittsfield, under the leadership of science teacher, Steve Antil, visited the Housatonic River project office in Pittsfield on December 7, 2001. Dick McGrath, a scientist for Roy F. Weston, Inc., an EPA/USACE contractor, presented information about the environmental chemistry of PCBs and the history and progress of the Housatonic River project. The students saw demonstrations of equipment used in sampling river water and sediments. The students also learned how river sediment samples are processed prior to shipment for laboratory analysis. The presentations and demonstrations followed several weeks of close interaction between project staff and St. Joseph's students and staff, during which a variety of project data were made available to the students to supplement their own data collection activities in the river.

Dick McGrath, WESTON Scientist, shows St. Joseph's students a "deep core" extracted from the Housatonic River

Varney Renews EPA Commitment

Robert Varney, EPA Regional Administrator

Robert W. Varney was appointed administrator of the U.S. Environmental Protection Agency's New England office by President George W. Bush and Administrator Christie Todd Whitman in August 2001.

Varney toured the GE Pittsfield/Housatonic River site last October and attended a Citizens Coordinating Council meeting. He used that opportunity to renew EPA's commitment to the project. "The GE-Pittsfield site continues to be a top priority for EPA," Varney said. "We are in this for the long haul."

Prior to joining EPA, Mr. Varney was one of the nation's longest serving state environmental commissioners. Appointed by three governors, Varney served as Commissioner for the New Hampshire Department of Environmental Services (DES) for 12 years. During his tenure, he is widely credited with instituting many management, program, and policy changes that have served as national models.

Mr. Varney was voted by his peers to serve as President of the Environmental Council of the States (ECOS), the national non-profit, non-partisan association of state and territorial environmental commissioners. As DES Commissioner, he chaired regional and national committees such as the Gulf of Maine Council, Ozone Transport Commission, New England Governors Conference Environment Committee, New England Interstate Water Pollution Control Commission, National Governors Association Superfund Forum, and ECOS Superfund Workgroup.

He holds a bachelor's degree from the University of New Hampshire and a master's degree from Michigan State University.

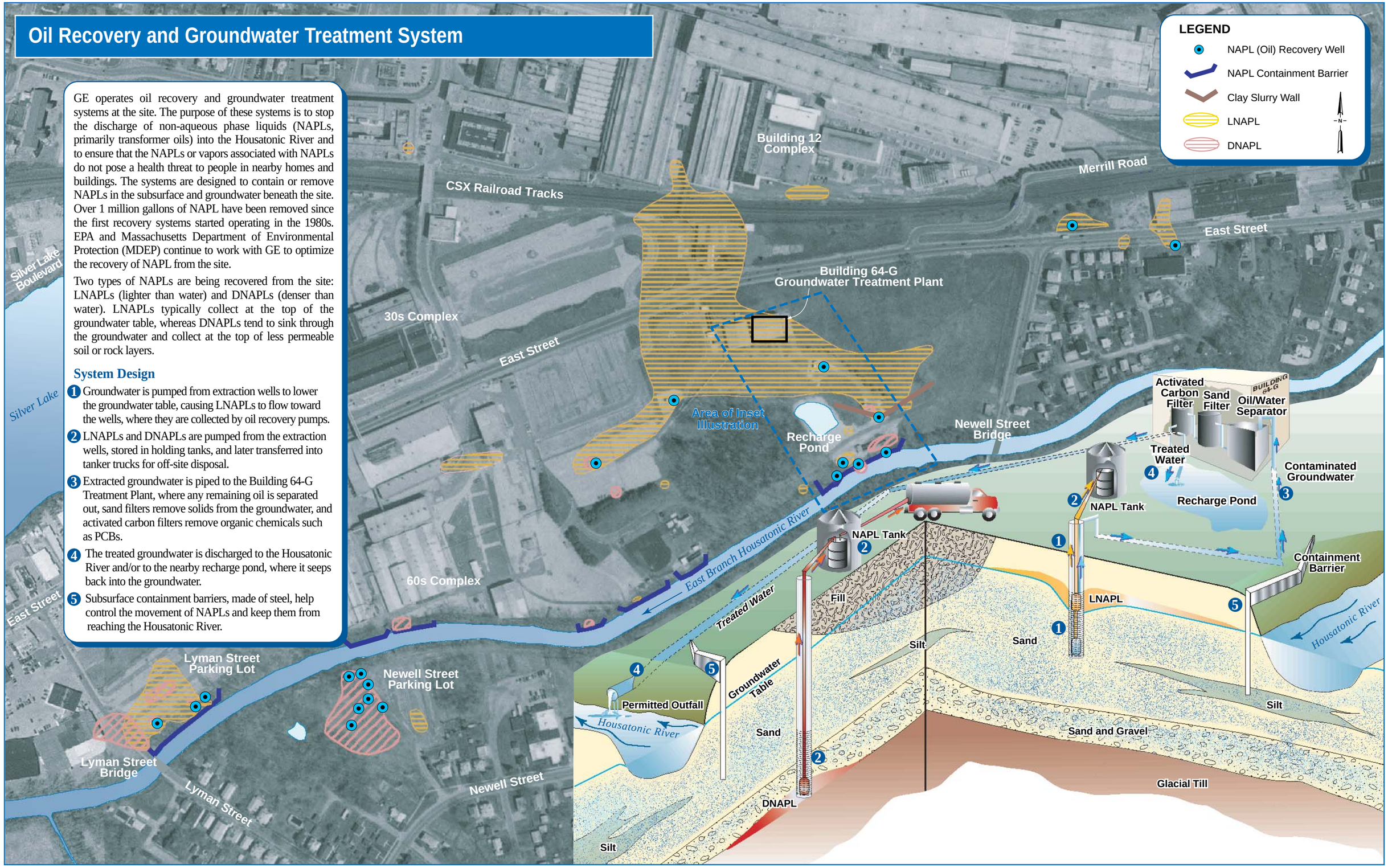
Oil Recovery and Groundwater Treatment System

GE operates oil recovery and groundwater treatment systems at the site. The purpose of these systems is to stop the discharge of non-aqueous phase liquids (NAPLs, primarily transformer oils) into the Housatonic River and to ensure that the NAPLs or vapors associated with NAPLs do not pose a health threat to people in nearby homes and buildings. The systems are designed to contain or remove NAPLs in the subsurface and groundwater beneath the site. Over 1 million gallons of NAPL have been removed since the first recovery systems started operating in the 1980s. EPA and Massachusetts Department of Environmental Protection (MDEP) continue to work with GE to optimize the recovery of NAPL from the site.

Two types of NAPLs are being recovered from the site: LNAPLs (lighter than water) and DNAPLs (denser than water). LNAPLs typically collect at the top of the groundwater table, whereas DNAPLs tend to sink through the groundwater and collect at the top of less permeable soil or rock layers.

System Design

1. Groundwater is pumped from extraction wells to lower the groundwater table, causing LNAPLs to flow toward the wells, where they are collected by oil recovery pumps.
2. LNAPLs and DNAPLs are pumped from the extraction wells, stored in holding tanks, and later transferred into tanker trucks for off-site disposal.
3. Extracted groundwater is piped to the Building 64-G Treatment Plant, where any remaining oil is separated out, sand filters remove solids from the groundwater, and activated carbon filters remove organic chemicals such as PCBs.
4. The treated groundwater is discharged to the Housatonic River and/or to the nearby recharge pond, where it seeps back into the groundwater.
5. Subsurface containment barriers, made of steel, help control the movement of NAPLs and keep them from reaching the Housatonic River.



Progress on Residential Cleanup Program

During Remediation

After Remediation

Contaminated Fill Problem Identified, Investigated, and Remediated — In 1997, EPA and the Massachusetts Department of Environmental Protection (MDEP) identified that some fill material given away by GE's Pittsfield facility, primarily during the 1940s and 1950s, was contaminated with polychlorinated biphenyls (PCBs). Since 1997, EPA, MDEP, and GE have investigated over 400 residential properties in Pittsfield and the surrounding areas where fill material originating from GE may have come to be located, and 164 of these properties required a cleanup by GE.

Residential Sampling, Remediation, and Restoration Process — The sampling and cleanup process involves consistent interaction between GE, MDEP, and homeowners. From an initial site visit and interview, through development of sampling plans and, if warranted, a remediation plan, homeowners are involved. GE, their contractors, and a MDEP representative work with homeowners to discuss and agree on restoration details. At the end of the cleanup process, GE will submit a Final Completion Report to MDEP. MDEP will review the report and issue an approval letter confirming that the response actions taken on the property have resulted in soil on the property meeting MDEP's standard for residential use.

Homeowner Cooperation Aids Remediation Process — Cooperation between MDEP, GE, and the homeowners has resulted in sampling and remediation of a large number of residential properties in a relatively short period of time. Despite the inconveniences and disruptions, homeowners have shown a willingness to cooperate with MDEP and GE, and this has facilitated the cleanup process.

Residential Fill Outreach Program — EPA, MDEP, and GE have undertaken an aggressive program to sample and clean up residential properties contaminated by PCBs in Pittsfield and the surrounding area. MDEP continues to compile and evaluate new information regarding residential properties that potentially received fill material from GE. Because there may be other residential properties currently unknown to MDEP where contaminated fill may be present, MDEP urges any person who suspects that a residential property may contain fill from GE to contact MDEP. Fill from the GE facility typically contains man-made materials such as porcelain insulator parts, scrap metal, wood block flooring, and oily soil. You should also contact MDEP if you have any knowledge of historic filling activities at a particular property that may be related to GE, such as the use of GE trucks.

If MDEP determines that credible information indicates the potential presence of GE fill on a residential property, MDEP will refer the property to GE for sampling. If the sampling results exceed the state standard for PCBs for residential areas, GE will be required to clean up the property.

Please help us make sure that all potentially contaminated properties are investigated and, if warranted, are cleaned up as quickly as possible.

For more information, contact the MDEP representative, Eileen Barnes, Project Manager, at (413) 755-2292.

Berkshire Environmental Fund Provides Alternative to GE Sampling — If MDEP determines there is not sufficient evidence of the presence of GE fill, MDEP does not refer a property to GE for sampling. In these cases, homeowners may apply to the Berkshire Environmental Fund (BEF) for partial or complete funding of sampling for PCBs at their property. Homeowners who fall into this category may contact the BEF for assistance with applying for such grants. MDEP has notified over 200 homeowners of the BEF option for having their properties sampled. For more information, contact Shep Evans, (413) 298-0044.

Tech Talk: *Polychlorinated Biphenyls (PCBs) and Toxic Equivalents*

Tech Talk will be a regular feature of this newsletter and will provide detailed technical information about important aspects of the GE/Housatonic River project.

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are synthetic organic chemicals. They are created when chlorine atoms replace hydrogen atoms on a biphenyl structure. The biphenyl structure is composed of two benzene rings, joined by a single carbon-carbon bond (Figure 1). There are ten positions where chlorine atoms can join on the biphenyl structure. As a result, there are 209 variations, or congeners, that could be created. Congeners are named according to the total number and location of chlorine atoms on the biphenyl rings.

Aroclors, which are mixtures of PCBs that were produced commercially, are defined by a four-digit number. The first two digits are usually 12. The last two digits represent the percentage by weight of chlorine in the mixture. For example, Aroclor 1260 contains 60% chlorine by weight.

Congeners

Approximately 130 of the 209 possible congeners are found in synthesized mixtures of PCBs. The number of chlorine atoms a congener contains influences how it reacts in the environment and its relative toxicity. For example, congeners with five to seven chlorine atoms tend to accumulate in the environment more than those with fewer chlorines, and less chlorinated congeners are metabolized by organisms more quickly.

Congeners have been grouped based on toxicity. Coplanar congeners (Figure 1) appear to be the most dioxin-like congeners in commercial PCB mixtures. Para-meta (e.g., non-ortho) congeners have chlorine substitutions at both para-positions and at least two of the meta-positions, with none on the ortho-positions. The second structural group is the mono-ortho congeners. This group is characterized by having a single ortho-chlorine substitution. Di-ortho congeners represent a third structural group that tends to exhibit fewer toxicological effects.

Planar Chlorinated Hydrocarbons

PCBs belong to a larger class of chemicals called planar chlorinated hydrocarbons (PCHs) that are regularly detected in the environment due to their persistent nature. PCHs include polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzo-p-furans (PCDF)—two groups with toxic characteristics. These compounds occur in the environment in trace levels and have been found as contaminants in PCB fluids.

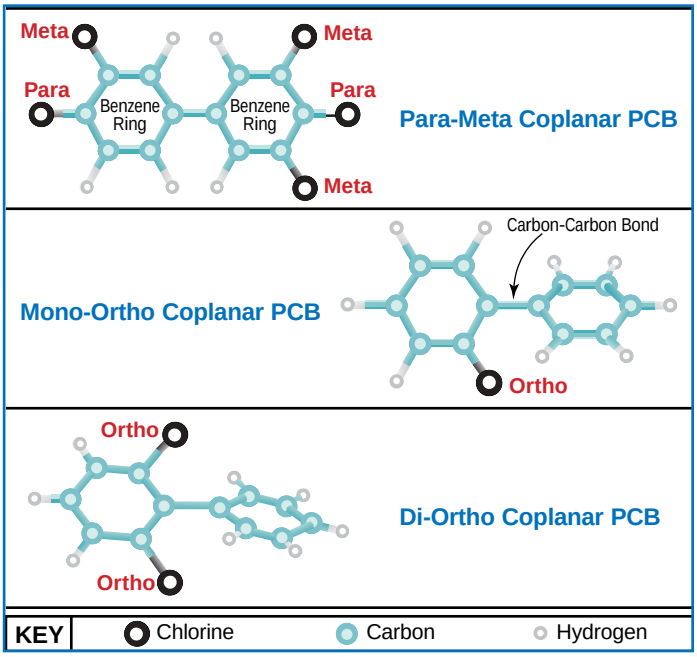


Figure 1. Structural Diagrams of Different Coplanar PCBs

As in the case of PCBs, the environmental degradation of dioxins and furans is a function of their composition and structure. Additionally, each of the dioxin and furan congeners have different toxicities.

Toxic Equivalency Factors (TEFs) and Toxic Equivalents (TEQs)

To help evaluate risk from these chemicals, a system has been created to estimate the relative toxicity of these mixtures. The system assigns toxic equivalency factors (TEFs) to different congeners in the coplanar PCB, dioxin, and furan chemical classes relative to the most toxic compound, 2,3,7,8-dioxin. The table below illustrates the range of TEFs that can exist within each class. The higher the TEF, the higher the toxicity.

Compound	TEF for Mammals
Selected PCB congeners	0.00001 – 0.1
Selected furans	0.0001 – 0.05
Selected dioxins	0.0001 – 1

In general, the dioxin and furan congeners are more toxic than most of the PCB congeners. However, since dioxins/furans are found in the environment at levels much lower than PCBs, the overall toxicity of PCBs can be in the same range as that of the more toxic compounds. The final assessment of toxicity is performed quantitatively based on the TEFs and the actual concentrations found on a site to derive toxic equivalents (TEQs).

▼ For More Information...

For general information about the GE/Housatonic River Site, go to: http://www.epa.gov/ne/ge

U.S. Environmental Protection Agency, New England Region
1 Congress Street
Boston MA 02114
1-888-372-7341

For general information or if you have comments on this newsletter, contact:
Rose Howell, Environmental Specialist, EPA
617-918-1213

Information about the Residential Fill Cleanup Program
Massachusetts Department of Environmental Protection
Eileen M. Barnes, Residential Fill Project Manager
Bureau of Waste Site Cleanup
413-755-2292

The Berkshire Environmental Fund, Inc.
Shep Evans, 413-298-0044

Information about the Citizens Coordinating Council and the Connecticut Subcommittee to the CCC
Harry Manasewich, Massachusetts Office of Dispute Resolution
617-727-2224, ext. 21181

Citizens Coordinating Council (CCC) Meetings Open to the Public

The primary mission of the CCC is to serve as a vehicle for community involvement in implementing the Consent Decree between GE and the government. CCC members include representatives of political, environmental, community, and business groups from Berkshire County and northwestern Connecticut.

The public is encouraged to attend CCC meetings and meetings of the Connecticut Subcommittee.

- CCC meetings are generally held the first Wednesday of each month from 5:30 p.m. to 7:30 p.m.
- Meetings of the Connecticut Subcommittee of the CCC are held quarterly.
- For dates, times, and locations of the CCC and the Connecticut Subcommittee meetings, go to **http://www.epa.gov/ne/ge/publiceventsandmeetings.html**

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