POLYCHLORINATED BIPHENYLS (PCBs)

A FACT SHEET

Providing Answers to Commonly Asked Questions Regarding PCB Exposure at the Hazardous Waste Sites Associated with the General Electric Pittsfield Facility and the Housatonic River

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
AND
United States Environmental Protection Agency
Office of Site Remediation and Restoration

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WHY THIS FACT SHEET?

The Massachusetts Department of Environmental Protection (DEP) and the United States Environmental Protection Agency (EPA) receive many questions from interested Berkshire County residents about polychlorinated biphenyls (PCBs) and how PCBs can affect the health of people who come into contact with them. This fact sheet has been prepared by DEP and EPA to provide answers to commonly asked questions about:

- PCBs and their harmful health effects;
- how PCBs entered the environment from the GE facility;
- how exposure to PCBs can occur and how to tell if you have been exposed;
- ways to reduce your potential for PCB exposure, and;
- what is being done to protect public health from PCB exposure.

WHAT ARE PCBs?

Polychlorinated biphenyls (PCBs) are a family of man-made chemicals that contain 209 different variations, or ***congeners***. PCBs are typically found in the environment as mixtures of different congeners. These mixtures are also known as Aroclors®, a trade name of the Monsanto Corporation.

There are no known natural sources of PCBs. PCBs are typically oily liquids, ranging from colorless to light yellow in color. They have no smell or taste. Because they do not burn easily and are a good insulating material, PCBs have been widely used as coolants and lubricants in transformers, capacitors, and other electrical equipment. Consumer products that may contain PCBs include old fluorescent lighting fixtures, hydraulic fluids and electrical devices or appliances containing PCB capacitors made before PCB use was stopped. The manufacture of PCBs was stopped in the

United States in 1977 because of evidence that PCBs build up in the environment and cause harmful effects.

HOW DID PCBs GET FROM GE INTO THE ENVIRONMENT?

PCBs are present in Housatonic River sediments, in soil, and in fill. There are also ***plumes*** of PCB-contaminated oil underneath the General Electric (GE) facility in Pittsfield. The plumes underneath the GE facility are masses of PCB-contaminated oil, several feet thick, that are present as a separate layer and do not mix with the groundwater.

There are four major ways in which PCBs entered the environment from the GE facility in Pittsfield.

- **PCBs were released from the GE facility directly into the river.**
- **PCBs seeped into the river from plumes underneath the GE facility.**
- **During floods, PCBs attached to river sediments were carried by river water up onto the floodplain.**
- **Trucks carried PCB-contaminated fill from the GE facility and placed it in low-lying, marshy areas in and around Pittsfield.**

PCB releases from GE into the Housatonic River

In years past, PCBs were directly released from the GE facility into the Housatonic River. Once in the river, PCBs attach to river sediments. PCBs do not dissolve easily in water and they do not become separated from sediments or soil easily.

PCB releases to the river via the plumes

The plumes of PCBs underneath the GE facility flow toward the Housatonic River. In the past, PCBs seeped into the river from the plumes. PCBs are no longer seeping into the river

from the plumes because GE installed containment systems which pump PCBs out of the ground before they reach the river.

Contamination of floodplain during floods

During floods, PCB-contaminated river sediments are carried by river water up over the riverbank and onto the floodplain. When the floodwaters recede, the river sediments and attached PCBs are left behind on the floodplain.

Placement of PCB-contaminated fill

Primarily in the 1940s and 1950s, trucks delivered fill from the GE facility (often at the request of the property owner) to many low-lying, marshy areas in and around Pittsfield. Some of these marshy areas are former oxbows. Other areas are just low-lying or uneven properties where the owner asked GE to deliver fill so the property would be level. Some, but not all, of the fill that GE provided was contaminated with PCBs. PCBs are bound tightly to the fill and do not move from the fill into groundwater or into other clean areas of soil or fill. Fill also may have been received from sources other than GE. Non-GE fill may or may not be contaminated.

Oxbows **are natural bends (or meanders) in a river.**

Former oxbows **are oxbows that became separated from the main stem of the Housatonic River (after the Army Corps of Engineers straightened portions of the river in the 1940s) and then were subsequently filled.**

HOW DO PCBs MOVE IN THE ENVIRONMENT?

Once in the environment, PCBs do not break down easily. They tend to remain attached to particles of soil or sediment. Any process that moves soil or sediment can also move the attached PCBs.

Examples of how PCBs move in the Environment:

- River sediments (with PCBs attached) can be carried by river water further down river or up onto the floodplain during floods.
- Fine dry soil (with PCBs attached) can be blown by the wind or stirred up during lawn mowing or dirt biking.
- In very hot weather, PCBs (if they are present at high levels) can also evaporate in small amounts from the soil into the air.

HOW MIGHT I BE EXPOSED TO PCBs?

For people in Pittsfield and the Housatonic River area, there are two main ways (routes) that exposure to PCBs can occur.

- ***Touching soil contaminated with PCBs.***

  Touching PCB-contaminated soil leads to exposure by **incidental ingestion** (ingestion of PCBs via hand-to-mouth contact) and **dermal absorption** (absorption of PCBs through the skin).

- ***Eating PCB-contaminated fish or other animals (such as frogs or turtles) from the Housatonic River.***

OBSERVE THE CONSUMPTION ADVISORY!

Fish, frogs and turtles from the Housatonic River and Silver Lake are contaminated with PCBs and should not be eaten!

There are also the following less important exposure routes.

PCBs in air measured to date in residential and recreational areas do not pose a short- or long-term health risk.

Air: Breathing air containing PCBs is another source of exposure. However, in the Housatonic River area, levels of PCBs in air in the floodplain are low. None of the levels of PCBs in air measured to date in residential and recreational areas would pose a short-or long-term health risk. The amount of PCB exposure people could receive from the air is much less than the amount of exposure people could receive from touching soil or eating fish.

Drinking Water: In Pittsfield and the Housatonic River area, drinking water is ***NOT*** contaminated with PCBs so this is not a route of exposure to PCBs.

Workplace Exposure: Workplace exposures to PCBs can occur during repair, maintenance and removal of PCB-containing materials (such as transformers). Since PCBs are no longer manufactured in the United States, workplace exposures are limited.

HOW DO I FIND OUT IF I HAVE BEEN EXPOSED TO PCBs?

There are tests to find out if PCBs are in your blood, body fat, and breastmilk. Because PCBs are found throughout the environment, nearly everyone is likely to have some measurable amounts of PCBs in their body. In the United States, average PCB levels in blood among people who have not had exposure in the workplace range from 4 to 8 ng/mL (parts per billion)[1]. Elevated levels of PCBs in comparison to the general population will show that you have been exposed to high levels of PCBs. The tests do not determine the source of your exposure, the exact amount or type of PCBs you have been exposed to, how long you have been exposed, or predict

whether you will develop harmful health effects. Elevated levels of PCBs in your body can suggest that you may have an increased risk of developing harmful health effects compared with the general population.

Blood tests are the easiest and safest method for detecting recent exposures to large amounts of PCBs. If you are concerned and want to find out whether you have been exposed to PCBs, you should contact your doctor.

HOW CAN PCBs AFFECT MY HEALTH?

The potential for adverse health effects following exposure to any chemical depends upon a number of factors, including how much exposure occurred, the concentration to which the person was exposed and the toxicity of the chemical in question.

PCBs have been shown to produce a wide variety of effects in many animals, including severe skin problems, liver cancer, liver damage and reproductive and developmental effects. Monkeys, which are physiologically more similar to humans than other animals, have developed adverse immunological and neurological effects, as well as skin and eye irritations after ingesting PCBs.

Studies of U.S. workers exposed to PCBs in the workplace show that PCBs can cause skin problems such as acne and rashes and irritation to the nose and lungs. Levels of PCBs in workplaces where PCBs were used are generally much higher than levels found in the environment. There are studies which have reported neurological and behavioral abnormalities in infants born to mothers who ate PCB-contaminated Great Lakes fish, and adverse effects on intellectual function in young children whose mothers ate PCB-contaminated Great Lakes fish. In these studies, the mothers' exposures to PCBs were estimated and not measured directly so these studies do

not prov... information about the amount of PCB exposure that leads to adverse health effects.

PCBs may also be potential endocrine disruptors. The term endocrine disruptors applies to any number of a broad class of chemical compounds with the ability to interfere with the normal functioning of hormones. Concern about endocrine disruptors stems from a collection of evidence (primarily in wildlife) on a variety of compounds which indicates that exposure to some chemical agents in the environment which interfere with hormones can potentially lead to adverse health effects, including effects on reproductive function, development, neurotoxicity and immunofunction. At this time, the available information is not sufficient to determine whether PCBs are likely to affect human endocrine systems or to measure potential effects.

The U.S. Environmental Protection Agency has determined PCBs to be probable human carcinogens. This classification is based upon animal studies in which rats that ingested certain mixtures of PCBs throughout their lives developed cancer in their livers. Studies of people exposed to PCBs do not provide enough information to definitively determine if PCBs cause cancer in humans.

WHAT ACTIONS HAVE BEEN TAKEN TO ENSURE PROTECTION OF PUBLIC HEALTH FROM PCBs?

DEP and EPA have taken immediate actions (also called short-term cleanup measures or Immediate Response Actions) to ensure protection of public health until a permanent cleanup is completed. DEP and EPA have taken short-term cleanup measures in residential and recreational areas where PCBs exceed the appropriate DEP Short-Term Action Level in surface soil (top six inches).

Short-term measures DEP and EPA have taken to address exceedances of these action levels include soil removal,

placement of vegetative barriers and placement of warning signs and fences.

DEP SHORT-TERM ACTION LEVELS FOR PCBs

- **In residential lawns, the Agencies have taken short-term measures when PCBs in surface soil exceed 10 ppm (parts-per-million, mg/kg).**
- **In recreational areas, the Agencies have taken short-term measures when PCBs in surface soil exceed 30 ppm.**
- **In walking pathways, the Agencies have taken short-term measures when PCBs in surface soil exceed 50 ppm.**

Many residents and river users already may have been exposed to PCBs for a long period of time. DEP accounted for this in determining the action levels. DEP and EPA are confident that the short-term measures taken will protect people. However, DEP and EPA recognize that it is impossible to know every person's particular activity patterns and chance of exposure from either previous or future activities. Since PCBs accumulate in body fat, every exposure to PCBs adds a little bit to a person's body burden of PCBs. Many people may not know whether they have been exposed, or to what extent, and may want to avoid or minimize further exposure until final cleanups are completed.

DEP and EPA recognize this concern and offer the following recommendations on ways to reduce PCB exposure and potential risks in residential and recreational areas. These recommendations are especially applicable to people who may contact soil and sediment in the floodplain between GE's facility in Pittsfield and the Woods Pond Dam in Lenox. This is the area where sampling shows the highest PCB soil and sediment levels. People who could contact soil or sediment

in are of lower PCB concentration may also follow these recommendations if they wish to further minimize their potential for exposure until final cleanups are completed. These recommendations also apply to people who may contact soil in areas that have PCB-contaminated fill.

RECOMMENDED WAYS TO REDUCE PCB EXPOSURE IN RESIDENTIAL AREAS

The following are actions you can take if you wish to further reduce your possibility of PCB exposure in potentially contaminated residential areas, until final cleanups are completed.

- ***Minimize skin contact with soil during activities such as gardening and wash soil from your skin whenever possible.***
- ***If you have your own garden, consider reducing or eliminating your consumption of homegrown vegetables. As an alternative, consider growing your vegetables in a raised garden bed filled with clean soil.***
- ***Avoid tracking soil from potentially contaminated areas into your home.***
- ***Minimize activities likely to produce high levels of dust in areas where soil may be contaminated with PCBs. For example, avoid running your mower over areas of sparse lawn during periods of dry weather.***
- ***Limit the amount of time that children might play in potentially contaminated soil to a few days per week.***

RECOMMENDED WAYS TO REDUCE PCB EXPOSURE IN RECREATIONAL AREAS

The following are actions you can take if you wish to further reduce your possibility of PCB exposure in potentially contaminated recreational areas, until final cleanups are completed.

- *Obey the fish, frog and turtle consumption advisory for the Housatonic River and Silver Lake. Do not eat other food such as shellfish or ducks caught in the Housatonic River or Silver Lake.*
- *Minimize skin contact with soil and sediment and wash soil and sediment from your skin whenever possible.*
- *Avoid tracking excess soil into your car or home.*
- *Minimize inhalation of dust from soils by avoiding activities which generate excessive dust (dirt biking, for example).*
- *Limit recreational visits and access to the river to about once per week for children who might play in potentially contaminated soil and sediment.*

In response to specific questions from concerned citizens, DEP also evaluated risks from the following three activities.

- ***River Cleanup Work***: cleanup of trash and other debris by community members to help preserve the river.
- ***Competitive Canoeing***: use of canoe launch areas by recreational and competitive canoeists.
- ***Fiddlehead Fern Consumption***

DEP's conclusions and recommendations about these three activities are summarized in the following table.

Activity	DEP Conclusions	DEP Recommendations
River Cleanup	Risks from PCB exposure to volunteers participating in Housatonic River cleanup days are very low.	- Wear protective boots and long-sleeved clothing to minimize contact with sediments. - Wash these items or place in a plastic bag before entering your car or home.
Canoeing	Risks from PCB exposure to canoeists who use canoe launch areas on a frequent basis are very low.	- Minimize skin contact with sediment. - Wash sediment from your skin as promptly as possible (especially competitive canoeists who may have more frequent and intense contact with sediment than recreational canoeists).
Fiddlehead Fern Consumption	- DEP sampled fiddleheads growing in PCB-contaminated soil along the Housatonic River. DEP found only **extremely low** levels of PCBs in the fiddleheads themselves. - Fiddlehead ferns are safe for consumption.	- Minimize skin contact with soil while harvesting fiddleheads (use protective gloves or wash soil from your skin as promptly as possible). - Avoid tracking excess soil into your car or home. - Wash fiddleheads thoroughly to remove all traces of soil before eating.

WHAT IF I HAVE QUESTIONS?

For additional information, or to learn more about the short- and long-term cleanup plans or the risk assessment work, contact:

J. Lyn Cutler, DEP, (413) 784-1100
OR
Bryan Olson, EPA, (617) 573-5747

INFORMATION REPOSITORIES

To provide Berkshire County residents with easy access to information relevant to the investigation and cleanup of the Housatonic River and GE Pittsfield sites, EPA and DEP have established Information Repositories at the following locations:

- **Berkshire Athenaeum Public Library, Pittsfield, (413) 499-9488**
- **Berkshire County Regional Planning Commission, Pittsfield, (413) 442-1521**
- **Lenox Public Library, Lenox, (413) 637-0197**
- **Simon's Rock College of Bard, Great Barrington, (413) 528-7274**

All repositories contain official correspondence; Scopes of Work, and reports and documents regarding the sites. Information is sent to the repositories as it becomes available. Information on fill properties is not in the repositories. It is presently available only at DEP's Western Regional Office, 436 Dwight Street, Springfield, Massachusetts 01108.

DEP & EPA have established a mailing list containing th names and addresses of individuals who express an interest in receiving information about the disposal sites. Notifications announcing the placement of major new documents in the repositories and notifications of public meetings are sent to people on this mailing list. If you are not already receiving information about the Housatonic River and GE Pittsfield Disposal Sites and would like to be added to the Sites' mailing list, please write to:

Susan Steenstrup, Regional Public Involvement Coordinator
DEP Bureau of Waste Site Cleanup
436 Dwight Street
Springfield, Massachusetts, 01103

or call Susan Steenstrup at (413) 784-1100, extension 264.

Notes:

[1] *Toxicological Profile for Polychlorinated Biphenyls*, draft for Public Comment, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, February 1996.