

## Sheboygan River and Harbor Superfund Site

### Site Description

The Sheboygan Harbor and River Superfund Site extends approximately 14 miles through the communities of Sheboygan Falls, Kohler, and Sheboygan, Wisconsin. The site includes Sheboygan Harbor, located on Lake Michigan, and the lower Sheboygan River, which discharges into the Sheboygan Harbor. In 1977, the state of Wisconsin detected polychlorinated biphenyls (PCBs) during routine sampling of fish. Since then, PCBs have been detected in fish, wildlife, surface water, sediments in the harbor and river, and in floodplain soils. The highest concentrations of PCBs have been detected in sediments immediately downstream from a die-casting plant in Sheboygan Falls. Concentrations decline farther downstream from the plant.

During the remedial investigation (RI), the U.S. Environmental Protection Agency (EPA) divided the river into three sections based on physical characteristics such as average depth, width and level of PCBs in sediment. The Upper River extends from the Sheboygan Falls Dam downstream 4 miles to the Waelderhaus Dam in Kohler. The Middle River extends 7 miles from the Waelderhaus Dam to the former Chicago & Northwestern (C&NW) railroad bridge. The Lower River extends 3 miles from the C&NW railroad bridge to the Pennsylvania Avenue Bridge in downtown Sheboygan. The Inner Harbor includes the Sheboygan River from the Pennsylvania Avenue Bridge to the river's outlet to the Outer Harbor. The Outer Harbor is defined as the area formed by the two breakwalls (EPA, 2000a).

### Potential Responsible Parties (PRPs)

Tecumseh Products Company (Tecumseh) is one of the three identified potentially responsible parties (PRPs) for this site. Tecumseh performed the early removal actions and the remedial investigation/feasibility study (RI/FS). Kohler Company (Kohler) and Thomas Industries are the other two PRPs for the site. Pollution Risk Services (PRS) is also a responsible party for the site.

In May 2003, the Department of Justice on behalf of EPA lodged a consent decree for Tecumseh to implement the Upper River portions of the May 2000 Record of Decision (ROD) signed for the site. The work covers PCB source control at Tecumseh's Sheboygan Falls plant, dredging of 22,000 cubic yards PCB-containing sediment from 4.8 miles of the river downstream of the plant (Upper River), and floodplain soils

adjacent to that stretch of river. The estimated cost of the work is approximately \$28 million. The United States also recovered \$2.1 million in past costs.

In November 2005, an Amended Consent Decree was signed by EPA and Tecumseh. Under the Amended Consent Decree, a third party, designated the "Work Party," PRS, the company who bought the former Tecumseh facility, would be liable for the cleanup of the Upper River section of the site. Tecumseh would continue to be liable for the completion of the remedy.

As of Spring 2007 EPA began negotiations with Tecumseh, PRS, Thomas Industries, and Kohler for a second Consent Decree to implement the cleanup of the Middle River, the Lower River and Inner Harbor. The negotiations are still in progress and no agreement has been reached (Pablo Valentin, EPA Project Manager, personal communication, September 26, 2007).

### **Threats and Contaminants**

The sediments, soils and surface waters of the Sheboygan Harbor and River contain PCBs and heavy metals such as arsenic, chromium, copper, lead and zinc. In 1978, the state of Wisconsin issued a fish advisory for the Sheboygan River and two of its tributaries, the Mullet and Onion Rivers, due to the presence of PCBs and heavy metals. A "Do Not Eat" fish advisory for all sizes of all Resident Fish Species (including carp, walleye, smallmouth bass, catfish, northern pike, rock bass, bluegill and crappie) was issued in the 2007 Wisconsin PCB Advisory for the Sheboygan River from the dam at Sheboygan Falls downstream to the mouth.

### **Cleanup Approach and Remedial Activities**

A ROD was issued in May 2000 requiring the following activities on the Sheboygan River and Harbor Superfund Site:

- "Upper River sediment characterization, removal of approximately 20,774 cubic yards of PCB-contaminated sediment to achieve a soft sediment surface weighted average concentration (SWAC) of 0.5 parts per million (ppm) in the Upper River, and fish and sediment sampling to document natural processes and ensure that over time the entire river will reach an average PCB sediment concentration of 0.5 ppm or less.

- Middle River sediment characterization, removal of sediment if necessary to achieve a soft sediment SWAC of 0.5 ppm in the Middle River, and fish and sediment sampling to document natural processes and ensure that over time the entire river will reach an average PCB sediment concentration of 0.5 ppm or less.
- Lower River sediment characterization, removal of sediment if necessary to achieve a soft sediment SWAC of 0.5 ppm in the Lower River, annual bathymetry surveys to identify areas susceptible to scour, and fish and sediment sampling to document natural processes and ensure that over time the entire river will reach an average PCB sediment concentration of 0.5 ppm or less.
- Inner Harbor sediment characterization, removal of approximately 53,000 cubic yards of PCB-contaminated sediment to achieve a SWAC of 0.5 ppm in the Inner Harbor, annual bathymetry surveys to identify areas susceptible to scour, fish and sediment sampling to document natural processes and ensure that over time the entire river will reach an average PCB sediment concentration of 0.5 ppm or less, and maintenance of the outer harbor breakwalls.
- Removal of floodplain soils containing PCB concentrations above 10 ppm.
- Investigation and mitigation of potential groundwater contamination and possible continuing sources at the Tecumseh Products Company plant in Sheboygan Falls (i.e., Tecumseh's Sheboygan Falls plant)."

The ROD projected a total cost of \$40.9 million (present value) - \$23.8 million for the Upper River, \$2 million for the Middle River, \$10 million for the Lower River and Inner Harbor, \$4.5 million for the floodplain soils and \$600,000 for Groundwater Investigations Source Controls.

### **Phase 1 Upper River Cleanup**

The first phase of the Upper River cleanup took place from August 2004 to October 2004 and focused on identifying methods to control PCB-containing soil and groundwater at the former Tecumseh Plant from entering the Sheboygan River and Harbor, and to clean groundwater, surface soil and riverbank soil at the former Tecumseh property. The former Tecumseh property was remediated in accordance to the May 2003 Consent Decree that required Tecumseh to implement the remedy outlined in the May 2000 ROD, however a few minor changes were made to the original agreement with EPA and Wisconsin Department of Natural Resources

(WDNR) approval. EPA required PRS, the company who bought the former Tecumseh facility, to complete the Phase 1 activities outlined in the May 2000 ROD with the following changes:

- Skip additional pre-design investigation prior to proceeding with the cleanup of the river
- Install a trench to collect, contain and control dissolved PCBs in groundwater flowing from the Tecumseh facility to the Sheboygan River and eliminate detailed studies on the need for the trench
- Change the cleanup boundaries so that all work done in the Upper River occurs at the same time to minimize disturbances in the river
- Do pre-investigation work for the floodplain and Upper River before the second phase of the cleanup begins to ensure that current site conditions are known
- Do some pre-design work for the second phase while PCB removal for the Upper River continues.

Phase 1 remedial activities included:

- Build a groundwater trench to collect, contain and control dissolved PCBs in groundwater flowing from the former Tecumseh facility to the Sheboygan River.
- Install additional wells near the trench to determine its effectiveness.
- Monitor the groundwater twice yearly for five years at the former Tecumseh facility and then less frequently as appropriate

River cleanup included:

- Removal of PCB-containing material from the riverbank area between the trench and the river.
- Removal of soil along the underground pipes originally used to discharge water from the former Tecumseh facility to the river.
- Removal of portions of these discharge pipes and the surrounding soil.

Surface and riverbank cleanup included:

- Removal of an estimated 20,744 cubic yards of PCB-contaminated sediment containing 88 percent of the Upper River's remaining PCBs (after the removal of soft sediments). Removal of 88 percent of the remaining PCBs in the Upper River will be required to achieve a PCB soft sediment deposit SWAC of 0.5 ppm for the Upper River.
- Removal of surface soil to achieve a soil PCB SWAC of 10 ppm or less upon completion of the remedy and reach an average PCB sediment concentration of 0.5 ppm or less within the river soft sediments.
- Removal of surface and subsurface soil along the riverbank to achieve a soil PCB SWAC of 10 ppm or less upon completion of the remedy and reach an average PCB sediment concentration of 0.5 ppm or less within the river soft sediments.

## **Phase 2 Upper River Cleanup**

The second phase of the Upper River cleanup was initiated in June 2006 and continued through November 2006. Phase II Upper River work was implemented by PRS. Phase II work activities included:

- The cleanup of the near-shore area, armored areas, and the soft sediment deposits between Rochester Park in Sheboygan Falls and a location about one-half mile upstream of the Riverbend Dam.
- Approximately 602 pounds of PCB-containing sediment were removed from this stretch of the river. The soft sediment was removed with a floating hydraulic dredge, piped to an on-shore area to dry. Sediment was dewatered on site and stored in large geotextile 'tubes'; water was drained out of the tubes and the remaining sediment was taken to a licensed landfill (EPA, 2007a). Any sediment with a PCB concentration greater than 50 ppm, determined by in-situ sampling, went to an offsite TSCA-approved landfill. The water removed during dredging was treated in a wastewater plant and released back into the river.
- Turbidity monitoring was conducted during dredging, there were no exceedances (EPA, 2007a).

- The armored areas were removed and disposed of in approved landfills to reduce the long-term management and maintenance for the site. Between 1989 and 1990, eight sediment deposits were “armored” in the Upper Sheboygan River. The armored areas are areas that have been reinforced in various ways to reduce erosion along steep slopes and stream banks to prevent PCB-containing sediment from moving downstream.
- The former Tecumseh facility continues to be used for staging and processing PCB-containing sediment which is dredged from the remaining sections of the Upper River.

Other phases to clean up the Middle River, the Lower River and Inner Harbor will be completed separately.

## 2007 Activities

Phase II Upper River soft sediment dredging continues and will proceed through October 2007. The sediment dredging began upstream of the Riverbend Dam, then moved to the stretch of the river between the Riverbend and Walderhaus dams. PRS is responsible for this part of the cleanup. Other Phase II activities for 2007 include the following:

- In 2007 PRS purchased the equipment to continue the dredging of sediment. PRS is performing the work using a floating hydraulic dredge as was used in the 2006 season (EPA, 2007a).
- The cleanup of four sections of floodplain soils on the Kohler property is pending. The EPA is currently working with Kohler to gain access to those areas so they can be cleaned at the same time as the river.
- In Spring 2007 EPA began negotiations with Tecumseh, PRS, Thomas Industries and Kohler for a second Consent Decree to implement the cleanup of the Middle River, the Lower River and Inner Harbor. When an agreement has been reached, the responsible parties will initiate sample collection and characterization of soft sediment deposits for these areas, possibly starting later 2007. The second consent decree is still in the negotiation phase, no agreement has been reached (EPA, 2007a).

A completion report is scheduled to be released before the end of 2007.

**References:**

EPA. 2000a. Record of Decision: Sheboygan Harbor and River. May 2000.  
(<http://www.epa.gov/superfund/sites/rods/fulltext/r0500030.pdf>)

EPA. 2000b. U.S. EPA Makes Final Decision on Sheboygan River and Harbor Cleanup. May 2000.  
([http://www.epa.gov/region5/sites/sheboygan/pdfs/sheboygan\\_0500.pdf](http://www.epa.gov/region5/sites/sheboygan/pdfs/sheboygan_0500.pdf))

EPA. 2004. First Phase of Upper River Cleanup to Begin Soon. August 2004.  
(<http://www.epa.gov/region5/sites/sheboygan/pdfs/sheboygan-fs-200408.pdf>)

EPA. 2006a. Second Phase of Upper River Cleanup Starting this Summer. Sheboygan River and Harbor Site. May 2006.  
(<http://www.epa.gov/region5/sites/sheboygan/pdfs/progress-report-200605.pdf>)

EPA. 2006b. Dredging Begins at Sheboygan River Site. June 21, 2006.  
(<http://yosemite.epa.gov/opa/admpress.nsf/835ee120715954a5852572a000657b5f/105493339b4010268525719400442174!OpenDocument>)

EPA. 2007a. Personal Communications with Pablo Valentin, Remedial Project Manager for the Sheboygan River and Harbor Site.

EPA. 2007b. Completion of Upper River Cleanup Scheduled for this Summer. Sheboygan River and Harbor Site. April 2007.  
(<http://www.epa.gov/region5/sites/sheboygan/pdfs/sheboygan-fs-200704.pdf>)

EPA. 2007c. Sheboygan River and Harbor Superfund Site - Site History.  
(<http://www.epa.gov/region5/sites/sheboygan>)

EPA. 2007d. Sheboygan River and Harbor Site Summary.  
(<http://www.epa.gov/reg5sfun/sfd/npl/wisconsin/WID980996367.htm>)

EPA. 2007e. Administrative Settlement Agreement and Order on Consent For Remedial Investigations and Feasibility Studies. January 26, 2007.  
([http://www.epa.gov/region5/sites/campmarina/pdfs/settlement\\_and\\_order\\_200701.pdf](http://www.epa.gov/region5/sites/campmarina/pdfs/settlement_and_order_200701.pdf))