



Region 5 Superfund (SF)

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OUTBOARD MARINE CORP.

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U.S. EPA REGION 5
LAKE COUNTY
WAUKEGAN

Congressional District # 10

Site Description

The Outboard Marine Corporation (OMC) site is located on Lake Michigan around the northern Waukegan Harbor area in Waukegan, Illinois. The site contains four cleanup parcels, called "operable units" (OU). The Waukegan Harbor (WH) site is OU #1. The Waukegan Manufactured Gas and Coke Plant (WCP) site is OU #2. The PCB containment cells that were created when the harbor was cleaned up in 1990-1993 comprise OU #3, and the OMC Plant 2 site is OU #4.

Waukegan Harbor is a federally-authorized harbor that was constructed in the late 1800s. It is a designated port of refuge for boats caught in severe storms. Land use in the immediate area is marine-recreational and industrial. Waukegan maintains a public beach on Lake Michigan southeast of the WCP site and adjacent to the harbor entrance channel. Several industries use the harbor to deliver raw materials for the manufacture of wallboard and concrete. Pleasure boaters are served by a private marina located at the north end of the harbor and the Waukegan Port District also maintains a small craft mooring area in the harbor's central area.

From approximately 1948 to 1971, OMC purchased an estimated 8 million gallons of hydraulic fluid that contained PCBs and used it in its OMC Plant 2 building in its die casting process to make outboard motors. The fluids containing PCBs were sometimes discharged through floor drains onto the OMC Plant 2 property and also into Waukegan Harbor. As a result, 700,000 pounds of PCBs were estimated to be present in the soil on the OMC Plant 2 site and 300,000 pounds of PCBs were in the sediment in Waukegan Harbor. OMC cleaned up PCB-contaminated northern harbor sediment and some of the OMC Plant 2 soils in 1990-1993.

OMC also operated several vapor degreasers at the OMC Plant 2 facility to clean newly made parts with trichloroethylene (TCE). Leaking degreasers and/or TCE storage tanks have created a widespread TCE groundwater contaminant plume and an isolated dense, non-aqueous phase liquid (DNAPL) pool of TCE beneath the OMC Plant 2 site. OMC abandoned the Plant 2 facility in December 2002.

In the early 1900s, a wood-treating plant operated on the WCP site, followed by a manufactured gas plant in the 1920s and a coke oven gas plant in the 1940s. The plant was purchased and disassembled by OMC in approximately 1972. The WCP site was discovered during OMC's harbor cleanup in 1990. It has arsenic and polyaromatic hydrocarbon (PAH) soil contamination and the groundwater is contaminated with high levels of ammonia, arsenic, benzene, and phenol.

OMC declared bankruptcy in December 2000 and began liquidation proceedings in August 2001. The City of Waukegan purchased the WCP site and then the OMC Plant 2 site from the bankruptcy estate as part of its plan to revitalize its lakefront. It hopes to build townhomes and condominiums on the WCP and OMC Plant 2 sites once any necessary cleanup actions are completed.

Site Responsibility

The OMC site is being addressed through a combination of federal, state, and potentially responsible party (PRP) actions.

Threats and Contaminants

Sediment in Waukegan Harbor is contaminated with polychlorinated biphenyls (PCBs), although at much lower levels than in previous years due to the cleanup action that OMC completed in the early 1990s (see next section - Cleanup Progress). PCBs are chlorinated hydrocarbons and are a potential human carcinogen (may cause cancer) and can also cause non-carcinogenic effects such as developmental delays, immune deficiencies, and thyroid problems. PCBs do not easily biodegrade and can bioaccumulate in people or animals that are exposed to them.

Today, harbor sediment PCB levels average less than 3 mg/kg ("parts per million" or ppm). However, current data suggest the PCBs in the sediment could still be affecting benthic organisms as well as bioaccumulating in fish living in the harbor waters. Humans could be exposed to PCBs by consuming fish caught in the harbor that have stored PCBs in their fatty tissues. The state of Illinois monitors PCB levels in harbor fish on a yearly basis and a fish consumption advisory is now in effect.

Soil at the WCP site is contaminated with PAHs such as coal tar and creosote and with arsenic. Groundwater is contaminated with ammonia, arsenic, phenol, and benzene. Certain PAHs are carcinogens and others are not, yet they can cause non-carcinogenic health effects. Arsenic is a poison in high doses and a potential human carcinogen through prolonged exposure to much lower amounts (although it may also be an essential micro-nutrient). Humans could be exposed to the soil contaminants by accidental contact or ingestion and to the groundwater contaminants by ingestion. However, the WCP site is fenced to prevent casual contact with soil contaminants and no one will be allowed to use the groundwater as a source of potable water.

OMC Plant 2 was abandoned by the OMC bankruptcy trustee in December 2002. Site soil is contaminated with PCBs above 1 ppm. Groundwater and soil beneath the plant building is contaminated with various chlorinated volatile organic compounds (VOCs), including trichloroethene (TCE) and vinyl chloride., both of which are carcinogens. Humans could be exposed to the soil contaminants by accidental contact or ingestion and to the groundwater contaminants by ingestion. The OMC Plant 2 site is fenced to prevent casual contact with soil contaminants, and no one will be allowed to use the groundwater as a source of potable water.

The PCB containment cells were constructed by OMC in 1990-1993 when it cleaned up Waukegan Harbor. The cells contain PCBs at levels above 50 ppm to as high as 5000 ppm. They are covered with a low permeability soil layer and are inspected and maintained by the city of Waukegan. If the covers were to fail, humans could be exposed to PCBs in the stored soil by direct contact or ingestion.

Cleanup Progress

Waukegan Harbor (OU #1): EPA and OMC entered into a consent decree in 1989 requiring OMC to clean up PCB-contaminated sediment in Waukegan Harbor and portions of its OMC Plant 2 property that had PCB-contaminated soil. OMC began work in 1990, dredging the northern harbor area sediment and excavating the OMC Plant 2 area soils to achieve a PCB cleanup level of 50 ppm. Some of the sediment was thermally treated on site to distill off the PCB oils so that the oil could be sent off site for destruction. The rest of the sediment and excavated soils were placed into three containment cells - one was constructed in former harbor Boat Slip #3 and two were placed on the north side of the Plant 2 property. OMC installed groundwater extraction wells within the containment cells so that an inward groundwater gradient would be established in case of cell failure. All construction was completed by 1994 at an estimated cost to OMC of \$21 million. OMC operated and maintained the containment cells until shortly after it declared bankruptcy in 2000. EPA, and then Illinois EPA, took over the maintenance work on the containment cells after OMC ceased performing this work. The city of Waukegan is presently performing the maintenance work on the containment cells in accordance with an agreement with EPA and Illinois EPA.

EPA, Illinois EPA, and area stakeholders are now evaluating a second cleanup action for Waukegan Harbor because PCB levels in harbor-caught fish still are too high to be protective of human health. EPA released a proposed cleanup plan on November 3, 2008, for public comment. We also held a public meeting in November to present the plan and take public comments on the proposal. The proposal is to again dredge the harbor sediment, but this time the target cleanup level is 1 ppm (instead of 50 ppm). A thin residual mixing layer of clean sand would be placed in the harbor once dredging is completed to achieve a surface-weighted average concentration of 0.20-0.25 ppm PCBs in the sediment. This work is estimated to cost EPA and Illinois EPA \$34 million to conduct. The public comment period ended February 4, 2009, and EPA estimates that it will make a cleanup decision (issue a Record of Decision or ROD) by September 2009. The next step will be to produce design plans and specifications to enable the cleanup work to be placed out for bid. The design phase is planned for completion in April 2010.

Waukegan Coke Plant (OU #2): During the 1990-1993 harbor cleanup, OMC excavated and constructed harbor Boat Slip #4 because former harbor Boat Slip #3 was converted into a PCB containment cell. In the course of excavating the new boat slip, creosote-contaminated soils were discovered. This led to the discovery of the Waukegan Coke Plant (WCP) site directly to the south of harbor Boat Slip #4. Later, EPA and the North Shore Gas Company (NSG), a former site owner, entered into an administrative order on consent for the completion of a remedial investigation and feasibility study (RI/FS) at the WCP site. The RI was completed in February 1995 and a final FS was released in November 1998.

EPA issued a ROD on September 30, 1999, for the cleanup of the WCP site. We determined that soil contaminants should be cleaned up to commercial/industrial re-use levels (because OMC was still operating at the time) and groundwater be restored to drinkable status. Accordingly, soil would be excavated and disposed of or treated to remove arsenic and PAHs. Groundwater would be pumped and treated to remove high levels of ammonia, benzene, arsenic, and phenol and then would be subjected to a monitored natural attenuation (MNA) approach until final cleanup levels were met. This work was estimated to cost \$27 million to conduct.

NSG and General Motors Corporation (GM), another site PRP, began soil cleanup action in November 2004 and completed it in November 2005. Thousands of tons of arsenic- and PAH-contaminated soil were trucked off site for disposal in area landfills. Some of the more tarry material was trucked to Utah and Pennsylvania for disposal in co-burning facilities used to generate electricity. After all excavations were completed and testing was done to show that cleanup levels had been reached, backfill material was placed into the excavations and a 6- to 10-inch top soil layer was placed over the site.

NSG and GM completed the groundwater cleanup action design plans and specifications in 2006 and began construction of the water treatment system in April 2007. Construction of the plant was completed in fall 2008 and pumping and treatment of contaminated groundwater has begun. EPA estimates that the active groundwater action will last through 2011 to 2016, depending on how efficiently NSG and GM are able to run the treatment plant. Afterwards, a very long period of MNA will occur until cleanup levels are met.

PCB Containment Cells (OU #3): The city of Waukegan signed an agreement with EPA in 2005 to assume routine operation and maintenance of the PCB containment cells until at least 2011. At that point EPA plans to have a more far-ranging agreement in place to cover maintenance of the cells. To date, monitoring information shows that the cells are robust and no leaks have occurred.

OMC Plant 2 (OU #4): Before the OMC Plant 2 site was abandoned by the OMC bankruptcy trustee in 2002, EPA and Illinois EPA reached an agreement with the trustee whereupon the trustee would perform some immediate cleanup actions inside the plant. These actions included the removal of certain waste chemicals and the cleanup of some machinery. Afterwards EPA performed additional interior cleanup work to prevent the release of PCBs and other compounds into the environment. We completed this work in Spring 2003.

EPA began an RI/FS at the site in 2004 to determine the nature and extent of residual contaminants and to evaluate potential cleanup approaches. We identified four media of concern - the PCB-contaminated OMC Plant 2 building, PCB- and PAH-contaminated soil and sediment, TCE-contaminated groundwater, and a DNAPL comprised of TCE. The city of Waukegan had also conducted soil sampling along the lakefront dunesland in fall 2005, using Brownfields grant monies, and reported that it found a sample that read 14,000 ppm PCBs. EPA then began a removal action in January 2006 in the dunes area near the east containment cell. We excavated over 6,000 cubic yards of sand containing 10 ppm to 14,000 ppm PCBs and disposed of the sand off-site.

EPA released a cleanup proposal for the building and soils and sediment in January 2007 for public comment and we also began a pilot scale study of innovative means to clean up the groundwater and DNAPL. Also in January 2007 we undertook a final removal action at the OMC Plant 2 facility to dispose of about 25 PCB-containing electrical transformers to prevent vandals from breaking the transformers open and dispersing PCBs into the environment. We also removed an extensive amount of copper wire and electrical connectors from the plant to reduce the incentive for scavengers to break into the facility and expose themselves to PCB contamination while scavenging for copper.

We issued a ROD in September 2007 that called for the PCB-contaminated building to be demolished and the debris disposed of off site. The ROD also called for the excavation and off site disposal of soil and sediment at contaminant levels above 1 ppm PCB and 2 ppm PAHs. The estimated cost of this work is \$34 million.

Separately, EPA had notified the City of Waukegan in February 2006 that portions of the OMC Plant 2 building were not contaminated. Accordingly, in summer 2006 the city immediately began the demolition of the clean portions of the facility down to the concrete foundations. It completed this work in November 2006. Later, in summer 2008, the city contracted to have the concrete foundations removed as well, completing this work in fall 2008.

EPA began the remedial design phase of the selected building and soil cleanup action in September 2007 and completed this work in June 2008. We received funding under the American Recovery and Reinvestment Act (ARRA) in June 2009 to begin the cleanup work in accordance with the design. EPA plans to complete this cleanup work by December 2010.

EPA released a second proposed cleanup plan covering the groundwater and DNAPL in August 2008. We have proposed to enhance the naturally-occurring *in situ* ("in place") bacterial degradation of the dissolved organic solvents in the contaminant plume by adding a soluble food into some areas of the groundwater. This would allow the "solvent-eating" bacteria to thrive and greatly reduce the levels of dissolved solvents in the water. The pure TCE DNAPL would be destroyed using soil mixing machinery to add specially-made iron filings into the TCE that would act to dechlorinate the hydrocarbon. Once destroyed, the pure TCE would no longer be a constant source of groundwater contamination. Later, after the DNAPL was destroyed and much of the dissolved solvent in the groundwater was consumed by the bacteria, EPA would apply a MNA approach until groundwater cleanup levels are met (in about 10-20 years). Lastly, because contaminated groundwater flows off site towards Waukegan Harbor, EPA proposed to install an air sparge curtain to remove dissolved solvents from the water as it flows off site. The cost of all this work is estimated to be \$12.7 million.

EPA issued a ROD for the groundwater and DNAPL cleanup actions in February 2009 and has begun designing these cleanup remedies. We plan to complete the design phase for this work in September 2009. The groundwater and DNAPL cleanup work cannot be started until the building demolition step is completed; thus, cleanup work will likely begin in about fall 2010. Combined with the harbor and WCP cleanup actions, the OMC Plant 2 site cleanup actions would be the final cleanup actions planned for the OMC site.

Success Story

The soil cleanup was completed at the WCP site in 2005. Much of the surface of the property is now available for redevelopment.

EPA completed several removal actions at the OMC Plant 2 site to remove immediate environmental hazards while residual contaminant level studies are underway.

Community Involvement

The Waukegan Community Advisory Group (CAG) has been tracking cleanup progress in Waukegan Harbor for many years. This group of concerned citizens and area business and municipal representatives meets once a month to discuss local environmental issues and to lend support to the harbor cleanup efforts.

Property Reuse

The city of Waukegan has targeted most of the OMC site for redevelopment as soon as cleanup actions are completed. The city hopes to build a mixed-use development on the properties, including condominiums, shops, and marine-based service businesses. At this

time, the surface of most of the WCP site is available for redevelopment and a small part of the OMC Plant 2 site could be redeveloped as well.

<http://www.epa.gov/R5Super/npl/illinois/ILD000802827.htm>

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Aliases

OUTBOARD MARINE CORPORATION
WAUKEGAN MANUFACTURING GAS & COKE PLANT
OMC
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Site Profile Information

[This profile provides you with information](#) on EPA's cleanup progress at this Superfund site.