

**PREASSESSMENT SCREEN AND DETERMINATION**  
Lower Fox River and Green Bay, Wisconsin

U.S. Fish and Wildlife Service  
Region 3  
Ft. Snelling, Minnesota

Action: Final Preassessment Screen on the lower Fox River and Green Bay, Wisconsin (site) by the Department of the Interior (Department) and participating Native American Trustees.

Authority: The U.S. Fish and Wildlife Service (Service) is acting on behalf of the Secretary of the Department. The Secretary is delegated natural resource trusteeship by the Executive Order 12580 of January 23, 1987 and by the National Contingency Plan (NCP), pursuant to Federal Regulations at 40 CFR §300.600, to pursue Natural Resource Damage Assessment (NRDA) procedures, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. 9601 *et seq.*, the Federal Water Pollution Control Act (FWPCA), as amended, 33 U.S.C. 1251 *et seq.*, and Federal Regulations at 43 CFR §11.

**PREASSESSMENT SCREEN**

Requirement: Federal Regulations at 43 CFR §11.23(a) require natural resource trustees to complete a preassessment screen and make a determination as to whether a NRDA shall be carried out at the site, before any assessment efforts are undertaken. This document fulfills that requirement for this site and follows the structure of Federal Regulations at 43 CFR §11.

Notification and Detection: The release of polychlorinated biphenyls (PCB) (CAS 1336363) at this site has been reported by State and Federal response agencies (U.S. Environmental Protection Agency (EPA) 1976; Wisconsin Department of Natural Resources (WDNR) 1978; EPA 1982). The Service has notified the WDNR, the Menominee Tribe of Wisconsin, the Oneida Tribe of Indians of Wisconsin, and the Stockbridge-Munsee Community of Wisconsin about potential injury to natural resources potentially under their trusteeship. Representatives from the Menominee Tribe participated in initial NRDA planning, and the Department expects participation by some Native American trustees.

Emergency Restorations: The Trustees have not identified any need for emergency restorations at this site.

Sampling of potentially injured natural resources: Over the past 15 years, within the Fox River and Green Bay System, the Service has conducted or assisted in field investigations of injuries to migratory birds resulting from hazardous substances. In particular, the Service has investigated PCB exposure, uptake, and injury to Forster's terns (*Sterna forsteri*) in Green Bay (Kubiak, *et al.* 1989; Tillitt *et al.* 1993), double-crested cormorants (*Phalacrocorax auritus*) in Green Bay and Lake Michigan (Tillitt, *et al.* 1992; Dale and

Stromborg 1993; in progress), red-breasted mergansers (*Mergus serrator*) in Green Bay and Lake Michigan (Heinz, *et al.* 1983; Williams and Giesy 1992), black-crowned night-herons (*Nycticorax nycticorax*) in Green Bay (Rattner, *et al.* 1993), tree swallows (*Tachycineta bicolor*) in the Fox River and Green Bay (in progress), bald eagles (*Haliaeetus leucocephalus*) in the Fox River and Green Bay (in progress), and other species in the Fox River and Green Bay (Haseltine, *et al.* 1981; Ankley, *et al.* 1993). In addition, EPA and WDNR have begun to document possible pathways from known releases of PCBs in the Fox River to known injuries in the Fox River, Green Bay, and Lake Michigan (WDNR 1987, EPA 1989, EPA 1992, EPA 1993). All of this sampling and analysis may be directly relevant to NRDA procedures at this site.

General criteria:

(1) A release of a hazardous substance has occurred: PCBs (CAS 1336363), particularly Aroclor 1242 (CAS 53469219), have been emitted, emptied, discharged, allowed to escape, disposed, or otherwise released into the Fox River directly and indirectly (through publicly-owned treatment works (POTW)) from paper recycling, particularly de-inking, at paper mills in the Fox River Valley (Kleinert 1976; EPA 1976; WDNR 1978; Sullevin and Delfino 1982; EPA 1982). PCBs and Aroclor 1242 are listed as hazardous substances in Federal Regulations at 40 CFR §302.4, pursuant to section 102(a) of the CERCLA and section 311 of the FWPCA.

(2) (a) Natural resources for which the Department may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release:

- Endangered species, migratory birds, anadromous fish, and Federal lands are listed in the NCP at 40 CFR §300.600 as natural resources for which the Secretary of the Department has trusteeship. The Service administers endangered species authorities for the Department, pursuant to the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 *et seq.* The Service administers migratory bird authorities for the Department, pursuant to the Migratory Bird Treaty Act (MBTA), as amended, 16 U.S.C. 703 *et seq.* The Service administers anadromous fish authorities for the Department, pursuant to the Anadromous Fish Conservation Act (AFCA), as amended, 16 U.S.C. 757. The Service administers National Wildlife Refuge (NWR) lands for the Department, pursuant to the National Wildlife Refuge System Administration Act (NWRSA), as amended, 16 U.S.C. 668. In addition, nationally significant fish stocks in the Great Lakes belong to, are managed by, are controlled by, or appertain to the Service, pursuant to the Great Lakes Fish and Wildlife Restoration Act (GLFWRA), as amended, 16 U.S.C. 941.
- The bald eagle is federally-listed as a threatened species, pursuant to the ESA. The bald eagle, the Forster's tern, the common tern (*Sterna hirundo*),

the mallard (*Anas platyrhynchos*), the double-crested cormorant, the black-crowned night-heron, the tree swallow, the red-breasted merganser, the herring gull (*Larus argentatus*), the red-winged blackbird (*Agelaius phoeniceus*), and the cattle egret (*Bubulcus ibis*) are migratory bird species. The coho salmon (*Oncorhynchus kisutch*), the chinook salmon (*O. tshawytscha*), the pink salmon (*O. gorbuscha*), the rainbow trout (*Salmo gairdneri*), and the rainbow smelt (*Osmerus mordax*) are anadromous fish species. The Green Bay NWR and the Gravel Island NWR are Federal lands. Great Lakes populations of lake trout (*Salvelinus namaycush*), yellow perch (*Perca flavescens*), lake sturgeon (*Acipenser fulvescens*), walleye (*Stizostedion vitreum*), forage fish, and Atlantic salmon (*Salmo salar*) are nationally significant fish stocks, pursuant to the GLFWRA.

- Human health-based consumption advisories due to PCB contamination have been issued by the WDNR (starting in 1973) for the Fox River and Green Bay for, among others, the following species: the mallard, the coho salmon, the chinook salmon, the pink salmon, the rainbow trout, the rainbow smelt, the lake trout, the walleye, and the yellow perch.
- Exposure to PCBs and/or injury in the Fox River and Green Bay have been documented for the following species: the Forster's tern (Kubiak *et al.* 1989; Tillitt *et al.* 1993; Harris *et al.* 1993); the Forster's tern, the common tern, the tree swallow, and the red-winged blackbird (Ankley *et al.* 1993); the red-breasted merganser (Haseltine *et al.* 1981; Heinz *et al.* 1983; Williams and Giesy 1993); the black-crowned night-heron (Rattner *et al.* 1993); the double-crested cormorant (Tillitt *et al.* 1992; Dale and Stromborg 1993); the black-crowned night-heron and the common tern (Hoffman *et al.* 1993); the black-crowned night-heron, the herring gull, and the cattle egret (Heinz *et al.* 1985); and the lake trout (Jensen, *et al.* 1982).
- Sediments of the Gravel Island NWR have been measured at over 1 part per million (ppm) by the Service (Green Bay Field Office, unpublished data). In addition, the garter snake (*Thamnophis sirtalis*) (Heinz *et al.* 1980) and the double-crested cormorant (Tillitt *et al.* 1992; Dale and Stromborg 1993) on the Gravel Island NWR have been exposed to PCBs.
- The primary source of PCBs, particularly Aroclor 1242, to the Fox River, Green Bay, and even Lake Michigan has been, and continues to be, PCBs in Fox River sediments contaminated by paper mill discharges (Kleinert 1976; EPA 1976; WDNR 1978; Sullevin and Delfino 1982; EPA 1982; WDNR 1987, EPA 1989, EPA 1992, EPA 1993).

(2) (b) Natural resources for which Native American Trustees may assert trusteeship under CERCLA may include those subject to treaty rights such as hunting and fishing.

(3) The quantity and concentration of the released hazardous substances are sufficient to potentially cause injury to natural resources: From 1957 through 1971, 22,000 tons of PCBs (Aroclor 1242) were used to produce carbonless paper by the National Cash Register Corporation (NCR), Appleton Paper Division, Appleton, WI (EPA, 1976). According to WDNR estimates, between 84 tons and 130 tons of PCBs were discharged to the Fox River by paper mills between 1957 and present (Patterson *et al.* unpublished), primarily as a result of carbonless paper de-inking and recycling (EPA 1976, WDNR 1978, EPA 1982). Approximately 40 tons of PCBs are stored in the lower Fox River and Green Bay today (EPA, 1992). Sediments of the lower 30 miles of the Fox River contain large deposits of PCBs at concentrations as high as 100 parts per million (ppm) (WDNR, 1987) with "hot spots" at concentrations as high as 248 ppm (Doelger, pers. comm.). PCBs are highly persistent and the Fox River is expected to continue to be the primary source of PCB contamination to Lake Michigan, especially through re-suspension of sediments during storm events (EPA, 1992).

(4) Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost: The WDNR has spent over \$5 million at this site to characterize the PCB problem (Meyer pers. comm.). The EPA has spent over \$11 million to model the fate and transport of PCBs in the Fox River and Green Bay system (EPA estimate). The Service has spent over \$1 million on injury studies (Service estimate). Data from all of these studies will be available at no additional cost and can be used in support of a NRDA at this site. In addition, Department funding will be used to establish a nexus of causation between known releases and known injuries, as well as an accurate estimate of resulting damages to the public.

(5) Response actions planned will not sufficiently remedy the injury to natural resources without further action: No response actions have been undertaken since the PCB contamination problem was first identified in 1966. No response actions, pursuant to the FWPCA or the CERCLA, are proposed. No informal planning for potential response actions, pursuant to the FWPCA or the CERCLA, has been identified.

General coordination: No response actions, pursuant to the FWPCA or the CERCLA, are planned or underway. Coordination with voluntary efforts, such as the Lower Fox River Remedial Action Plan, the Lake Michigan Lakewide Management Plan, and the Fox River Coalition, will be considered to the full extent that the law allows.

Information on the site and on the release:

(1) The time, quantity, duration, and frequency of the discharge or release: Industrial pollution in the Fox River and Green Bay, particularly biological oxygen demand (BOD) and suspended solids (SS), have been documented by State agencies since 1938 (WDNR 1978). From 1957 through 1971, 22,000 tons of PCBs (Aroclor 1242) were used to produce carbonless paper by the NCR, Appleton Paper Division, Appleton, Wisconsin (EPA 1976; EPA 1982). PCB removal from effluents is accomplished through removal of BOD and SS (EPA 1982). Paper mills which recycle, particularly those which de-ink, discharged between 84 tons and 130 tons of PCBs to the Fox River between 1957 and present (Patterson *et al.* unpublished), primarily as a result of carbonless paper de-inking and recycling in combination with a lack of adequate treatment to remove BOD, SS, and PCBs (EPA 1976, WDNR 1978, EPA 1982). These discharged PCBs were deposited in Fox River sediments which contain currently some 40 tons of PCBs, primarily Aroclor 1242, and which continue to provide the single largest source of PCBs to the Fox River, Green Bay, and Lake Michigan (EPA 1976, WDNR 1978, EPA 1982, EPA 1989, EPA 1992, EPA 1993).

(2) The name of the hazardous substances: PCB (CAS 1336363); Aroclor 1242 (CAS 53469219).

(3) The history of the current and past use of the site: The Lower Fox River Valley has one of the highest concentrations of paper mills in the U.S. and one of the 3 highest concentrations of people in the State of Wisconsin. The Fox River has been used to carry industrial and sanitary waste since before the turn of the Century. Industrial pollution has been documented since the early 1900s, and pollution surveys and effluent characterizations have been conducted since 1938 (WDNR 1978). In response to State and Federal authorities, as well as pressure from recreational users of the Fox River and Green Bay, effluent quality of industrial and sanitary discharges was improved substantially in the 1970s and 1980s, particularly with regard to BOD, SS, and PCBs (EPA and WDNR national pollutant discharge elimination system (NPDES) files). However, PCBs in Fox River sediments from historical accumulation remain. Currently, recreational use of the Fox River and Green Bay is high in response to the dramatic improvements with regard to the discharge of conventional pollutants. However, PCB contamination continues to cause water quality standards exceedances, human health-based consumption advisories for fish and wildlife, and injuries to fish and wildlife. Fox River sediments appear to be the major source of these problems.

(4) Relevant operations occurring at or near the site: Municipal POTWs are also major dischargers to the Fox River. In some cases, paper mills discharge to these POTWs which then discharge to the Fox River. No likely significant source of PCBs, particularly Aroclor 1242, has been found, other than paper mills, particularly those which recycle and de-ink.

(5) Additional oil or hazardous substances potentially discharged at the site: The pesticide DDT and DDT metabolites have been documented in the Fox River and Green Bay System. Heavy metals, particularly mercury, have been documented in Fox River sediments. Extensive industrial pollution, other than PCBs, DDT, and mercury, may have contributed additional oil or hazardous substances, but extensive sampling has not identified any other such substances likely to injure natural resources significantly.

(6) Potentially responsible parties (PRP): a number of viable owners and/or operators of paper mills which recycle(d) and de-ink(ed) in the Fox River Valley are PRPs, including the Fort Howard Corporation, the P.H. Glatfelter Company, the Riverside Paper Corporation, the U.S. Paper Mills Corporation, and Wisconsin Tissue Mills, Incorporated.

Damages excluded from liability under CERCLA:

- Damages resulting from discharge or release of PCBs or Aroclor 1242 at this site were not identified in any environmental impact statement, pursuant to the National Environmental Policy Act (NEPA), as amended, 42 U.S.C. 4321 *et seq.*
- The release or discharge of PCBs or Aroclor 1242 by PRPs to Fox River sediments did not occur wholly before enactment of the CERCLA, nor the 1977 amendments to the FWPCA. The release or discharge of PCBs or Aroclor 1242 from Fox River sediments to the environment did not occur wholly before enactment of the CERCLA, nor the 1977 amendments to the FWPCA. Injuries to natural resources and resultant damages to the public from the release or discharge of PCBs or Aroclor 1242 did not occur wholly before enactment of the CERCLA, nor the 1977 amendments of the FWPCA.
- Damages resulting from the release or discharge of PCBs or Aroclor 1242 did not result from application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, 7 U.S.C. 136.
- Damages resulting from the release or discharge of PCBs or Aroclor 1242 did not result from any other federally-permitted release, as defined in section 101(10) CERCLA, with the following insignificant exception: several pounds of PCBs may have been discharged, pursuant to NPDES permit limits, which became effective on September 28, 1989 (0.47 ug/l) for the Ft. Howard Corporation and February 28, 1989 (0.24 pounds/year) for the P.H. Glatfelter Company. No other explicit NPDES permit limits for discharge of PCBs or Aroclor 1242 were effective previously for PRPs identified in this document. In addition, NPDES permits issued by the WDNR until circa 1985 contained the following bar from liability exclusion, pursuant to section 311 of the FWPCA:

"...Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the Federal Water Pollution Control Act (33 U.S.C. Section 1321). This applies to surface water discharges only..."

- Damages resulting from the release or discharge of PCBs or Aroclor 1242 did not result from recycled oil, as described by section 107 of the CERCLA, nor section 3014 of the Solid Waste Disposal Act (SWDA), as amended, 42 U.S.C. 6901 *et seq.*
- No other exclusion from damages is relevant to this site, pursuant to the CERCLA and the FWPCA.

Preliminary identification of resources potentially at risk:

- Preliminary identification of pathways: PCBs were manufactured by the Monsanto Company and sold to NCR Appleton Papers Division for use in carbonless paper production. PCBs were discharged to Fox River waters by de-inking paper mills as a result of recycling carbonless paper with insufficient treatment of wastewater to remove BOD, SS and PCBs. Dissolved PCBs entered the water column directly. PCBs which were bound to SS and other organic pollutants settled out of the water into Fox River sediments. Fox River sediments provide the largest single source of dissolved PCBs to the waters of the Fox River, Green Bay, and Lake Michigan. Fox River sediments provide the single largest source of PCB-contaminated organics to the Fox River and Green Bay, especially in conjunction with re-suspension of sediments by storm events. PCB-contaminated surface waters of the Fox River, Green Bay, and Lake Michigan, as well as PCB-contaminated sediments of the Fox River and Green Bay are accumulated by organisms via water uptake (membrane transport and drinking) and organic material uptake (root transport, sediment consumption, consumption of contaminated organisms). Bioaccumulation (including bioconcentration and biomagnification) increases with elevation in trophic level. Waste materials (fecal and decomposing bodies) transport PCBs further to both aquatic and terrestrial environments.
- Exposed areas: PCBs, particularly Aroclor 1242, have and can be measured in: PRP effluents; Fox River waters and sediments; Green Bay waters and sediments; Lake Michigan waters; and Fox River, Green Bay, and Lake Michigan biota. PCBs and Aroclor 1242 may also have spread to airsheds and watersheds beyond the Fox River, Green Bay, and Lake Michigan through biotic migrations and air transport.
- Exposed water estimates: Waters of the lower 38 miles of the Fox River, the approximately 1500 square miles of Green Bay, and Lake Michigan have been exposed (Swackhamer and Armstrong 1987; EPA 1992).

- Estimates of concentrations: PCB concentrations as high as 248 ppm in sediments (Doelger, pers. comm.), 250 parts per trillion in the water column (EPA, 1992), and 340 ppm (lipid-based) in double-crested cormorant tissues (GBFO, unpublished data) are still present in the system.

Potentially affected resources: The following natural resources are potentially affected: surface water; sediments; air; NWR lands; Tribal lands or lands held by the U.S. in trust for various Tribes; State lands; and biota, including endangered species, migratory birds, anadromous fish, nationally significant populations of fish, and fish subject to Tribal treaty rights. The following services to the public are potentially affected: sport fishing, hunting, bird watching, boating, tourism, and passive values provided by wilderness areas, parks, forests, waterways, and a healthy ecosystem.

**PREASSESSMENT SCREEN DETERMINATION**

Based on the information in this preassessment screen, the Trustees hereby determine that an assessment shall be carried out at this site in accordance with Federal Regulations at 43 CFR §11, Subparts C and E. The Trustees further determine that current information indicates that there is a reasonable probability of making a successful NRDA claim pursuant to section 107 of the CERCLA and section 311 of the FWPCA and that all criteria and requirements in 43 CFR §11, generally, and 43 CFR §11.23(a)-(g), §11.24, and §11.25, specifically, have been satisfied.

Date: 13 May 1994 Sam Marler  
Sam Marler, Regional Director  
U.S. Fish and Wildlife Service

Date: 5-17-94 Denise Homer  
Denise Homer, Acting Area Director  
Bureau of Indian Affairs

Date: 5/26/94 Jonathan P. Deason  
Jonathan P. Deason, Director  
Office of Environmental Policy and Compliance

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