

PCB Areas Operable Unit
Crab Orchard National Wildlife Refuge

Fact Sheet

Crab Orchard National Wildlife Refuge

PCB Areas Operable Unit Update

October 1996

Introduction

This fact sheet presents the latest information regarding the cleanup action for the PCB Areas Operable Unit (PCB OU) at the Crab Orchard National Wildlife Refuge (Refuge). The cleanup is being conducted under the terms of a Consent Decree, which is a legally binding agreement, among the U.S. Environmental Protection Agency (USEPA), Schlumberger Industries, Inc. (SII), and the U.S. Fish and Wildlife Service (Service), an agency of the Department of the Interior. Additional information on this project can be found in the Information Repositories and in the Administrative Record Files listed at the end of this fact sheet.

Cleanup of the PCB OU:

The cleanup of the PCB OU focuses on four sites:

1. **Site 17, Job Corps Landfill**—located in the northwest portion of the closed area of the Refuge, north of Crab Orchard Lake
2. **Site 28, Water Tower Landfill**—located in the southeast portion of the closed area of the Refuge, adjacent to Ogden Road and north of the Federal penitentiary
3. **Site 32, Area 9 Landfill**—located in the center of the closed portion of the Refuge, just south of Crab Orchard Lake
4. **Site 33, Area 9 Building Complex**—located just southwest of the Area 9 Landfill

Contamination of soil and sediment at these four sites has been cited by USEPA as a potential threat to human health and the environment. The clean-up method, or remedial action, selected involves thermal treatment (incineration) of the soil to permanently destroy the PCBs at a minimum efficiency of 99.9999%.



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Update

In September 1995, the USEPA approved the Remedial Action Implementation Plans pertaining to the cleanup of the PCB OU. These plans were developed by SII and reviewed by USEPA, the Illinois Environmental Protection Agency (IEPA) and the Service prior to their approval.

Performance verification testing of the Thermal Treatment Unit (TTU - or incinerator) was undertaken early in September 1996. During this rigorous testing program the unit was shown to destroy the PCBs with an efficiency better than the 99.9999% required by law. Stack emission levels were shown to be lower than the estimated levels used by the USEPA in compiling the Final Multimedia Level Risk Assessment for this project.

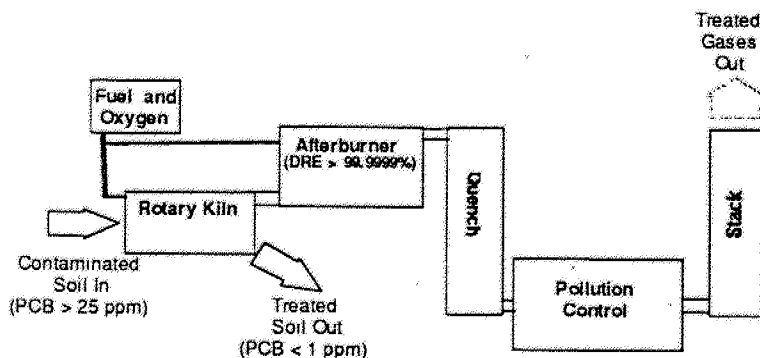
Excavation of contaminated soils at Site 17 and Site 28 has been completed. The areas have been restored and planted with prairie grass. Excavation of contaminated sediments from a small embayment of Crab Orchard Lake, close to Site 32, has also been completed. Excavation continues at Site 32 and Site 33.

What's next?

The next major stage in the cleanup is incinerator operations.

The results of the Trial Burn have been submitted to USEPA for review. Upon completion of their review and approval of the Trial Burn Report, USEPA will issue an operating approval for the TTU. Once operating approval is granted, incineration of contaminated soils will proceed through completion which is expected early in 1997. The TTU will then be dismantled and removed from the Refuge. The remedial action at the PCB OU, which includes the restoration of the contaminated areas is scheduled to be completed in the summer of 1997. Activities between the end of incineration and the end of remedial action will include the dismantling and removal of temporary facilities not required by the Service, as well as regrading and revegetating the disturbed areas.

The TTU



The contaminated soil is fed into a rotary kiln where the PCBs are "boiled" off the soil. The soil exits the kiln as ash and is tested to ensure the cleanup objectives have been met.

The PCBs, now in a gaseous state, pass through a cyclone and a high temperature baghouse before entering the Secondary Combustion Chamber (SCC or Afterburner) for destruction. The burners in the kiln and SCC mix No. 2 heating oil with oxygen to produce the elevated temperatures required. The high temperature in the SCC destroys the PCB molecules, breaking them down into water, carbon dioxide, and hydrogen chloride (HCl). This hot gas stream then passes through additional pollution control devices for cooling and removal of HCl, prior to discharge from the stack.

TTU Safeguards

The TTU will be operated around the clock by three teams of trained operators, headed by a Shift Supervisor and a Chief Operator, both located in the control room. Other technicians on each shift are located around the plant. The team is connected to the Shift Supervisor by radios, ensuring efficient communications.

A number of devices are in place to control air emissions. These include:

- A cyclone which swirls the air flow to remove heavy particles.
- A high temperature baghouse which comprises filter bags made of ceramic fibers capable of working at high heat levels (these bags filter out smaller particles in the same way that a coffee filter filters the coffee grounds).
- The quench, where the gas stream exiting the secondary combustion chamber is cooled very rapidly from 2000°F to around 375°F. This rapid cooling is performed by passing the gas stream through a curtain of water. The water is recycled through the plant and ultimately sent to the project Waste Water Treatment Plant (WWTU) where the water is treated then discharged.
- A second baghouse uses fabric filters with a fine mesh to further filter the gas for particles.
- A second quench is used to further cool the gas stream.
- Finally the gas stream passes through an acid scrubber to remove any acids from the gas stream.

Located throughout the plant are temperature sensors called thermocouples. These measure the temperature at key locations in the process including: kiln exit, SCC exit, quench exit, and scrubber entry temperatures. There are several thermocouples at each location to guard against failure. These temperature levels are monitored constantly by computer, are connected to alarms, and are set to trigger the automatic shutdown sequence.

Other parameters are also measured and monitored by the computer and also trigger the automatic shut down sequence. These include:

- Kiln entry pressure; less than atmospheric so that gasses do not escape the system.
- SCC residence time; to ensure destruction of PCBs.
- Combustion efficiency; to ensure plant is operating in balance.

Failure of either of the two burner systems, the soil feed system, the kiln rotation motor, the Programmable Logic Controller (PLC), the fan which draws air through the system (I.D. Fan), or a total power failure, all trigger an automatic shutdown. The operator can also initiate a shutdown manually (as is done for maintenance purposes) if required. It is not possible to over-ride the shutdown sequence once it has been initiated.

In most instances, shutdown consists of an Automatic Waste Feed Shut Off (AWFSO) where soil feeding is stopped but the burners keep operating to ensure treatment of the material in process. In the event of an AWFSO the gas stream still passes through all the pollution control equipment in the plant.

In a few shutdown scenarios, an Automatic Thermal Relief (ATR) may be triggered to ensure the safety of the plant personnel and prevent physical damage to the equipment. In the event of an ATR an AWFSO also occurs and the burners continue to operate so that the contaminants are destroyed.

In conclusion, there are numerous safeguards in place to ensure that operation of the plant is protective to the workers at the site, to the local community and to the local environment.

For Further Information...

Two administrative Record Files have been established and they contain all the information used by the USEPA to make their final decision on the selection of the cleanup method. Their purpose is to provide public access to site-related information. These files are established at:

Morris Library - Fifth Floor	USEPA, Region V
Southern Illinois University - Carbondale	77 W. Jackson Blvd.
Carbondale, IL 62901	Chicago, IL 60604-3590
Contact: Reference Librarian (618) 453-2818	Attn: Records Section, 7th Floor

There are four information repositories which contain brochures, work plans, reports and other fact sheets available to the public. These documents are available at the following locations during normal business hours:

Carbondale Public Library 405 W Main Street Carbondale, IL 62901 Reference Librarian (618) 457-0354	Marion Carnegie Library 206 S Market Street Marion, IL 62959 (618) 993-5935
Marion Federal Penitentiary Library, Rt. 5 Marion, IL 62959 Attn: Law Office (618) 997-1441	U.S. Fish & Wildlife Service 8588 Route 148 Marion, IL 62959 Attn: Leanne Moore (618) 997-5491

Community Relations Coordinators

Each Federal and State Agency has a Community Relations Coordinator who serves as primary point of contact and is also available to answer any questions. They are:

USEPA Region V Attn: John Perrecone 77 W Jackson Blvd. Chicago, IL 60604-3590	IEPA-Office of Community Relations Attn: Michelle Nickey-Tebrugge 2200 Churchill Road Springfield, IL 62974-9276	U.S. Fish & Wildlife Service Attn: Georgia Parham 620 S Walker Street Bloomington, IN 47403-2121
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Each agency has assigned Project Managers who serve as key team members. Those Project Managers are: Nan Gowda at USEPA, (312) 353-9236; Stephen Nussbaum at IEPA, (217) 782-9803; Mark Sattelberg at the Crab Orchard National Wildlife Refuge, (618) 997-3344; and Richard Davis at Schlumberger Industries, Inc. (713) 275-7781

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