



Superfund At Work

Hazardous Waste Cleanup Efforts

Bridgeport Rental & Oil Services Site Profile

Site Description: An abandoned tank farm and chemical lagoon

Site Size: 30 acres

Primary Contaminants: Polychlorinated biphenyls(PCBs), volatile organics, heavy metals

Potential Range of Health Effects: Central nervous system disorders and increased risk of cancer

Ecological Concerns: Cedar Swamp, a nearby tidal wetland

Year Listed on the NPL: 1983

EPA Region: 2

State: New Jersey

Congressional District: 1

Success in Brief

New Jersey Cleanup Settlement One of Largest

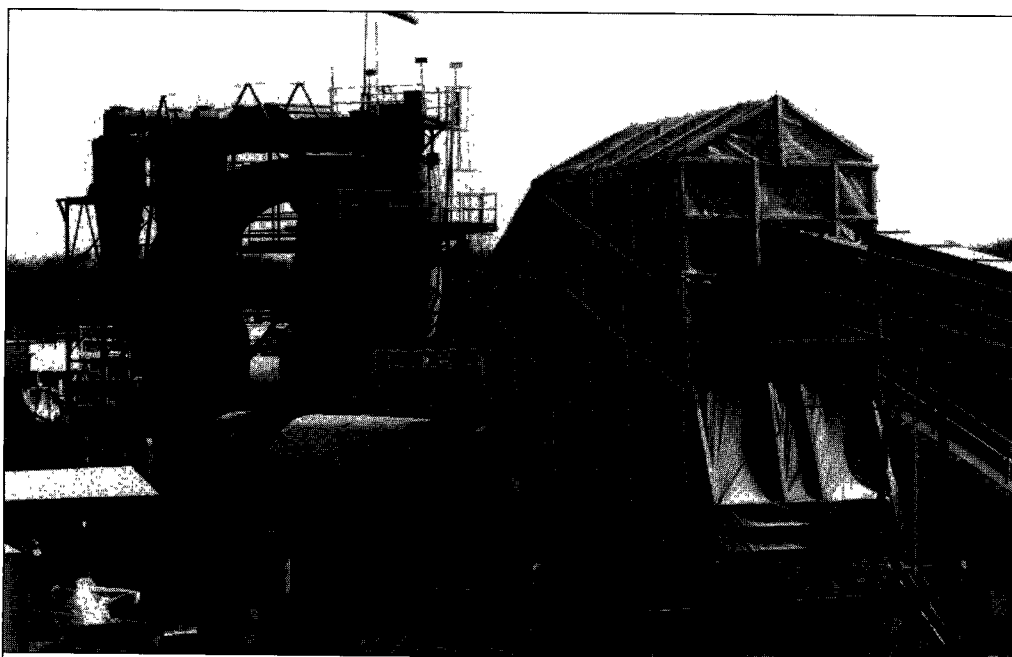
One of the largest and technically complex cleanups in New Jersey involved the remediation of the Bridgeport Rental and Oil Services (BROS) waste lagoon. Located in Logan Township, the Bridgeport site was once used to collect and store waste oil and spent commercial chemicals. The site's prominent feature was a 13-acre waste oil lagoon. Spills, leaks, and overflows from the lagoon threatened a major drinking water aquifer and polluted a fragile wetland nearby.

The cleanup involved the on-site incineration of more than 172,000 tons of hazardous wastes and treatment of almost 200 million gallons of wastewater. Other cleanup actions at the site included EPA's dismantling of a former tank farm and the construction of an alternate water supply for 15 homes by the New Jersey Department of Environmental Protection (NJDEP).

Following the site work, a major settlement was reached for the site. More than 90 companies and federal and state agencies agreed to contribute approximately \$222 million toward past and future cleanup work at the site. Also as part of the settlement, a group of private parties agreed to perform the investigation and feasibility study for the ground water remedy. This represents one of the largest Superfund settlements to date.

The Site Today

The lagoon has been completely filled in, covered with topsoil, and seeded. Remaining work includes a comprehensive wetlands assessment and ground water study. EPA and NJDEP are expected to select appropriate remedies after public review and comment in 1999.



Thermal destruction of PCBs took about four years

A Site Snapshot

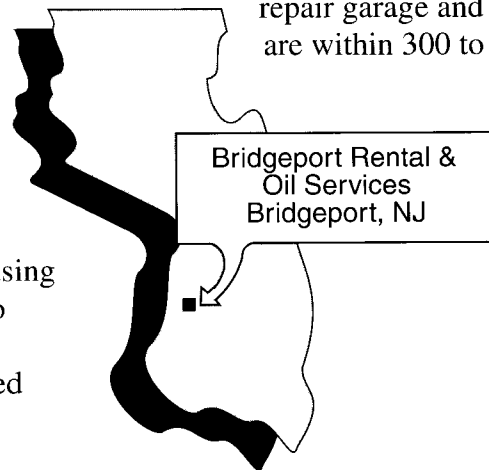
The 30-acre Bridgeport Rental and Oil Services site was a former waste oil storage and recovery facility. The property was originally a tank farm with about 100 tanks, process vessels, drums, and tank trucks. A 13-acre waste oil and wastewater lagoon contained 2.5 million gallons of oil contaminated with polychlorinated biphenyls (PCBs), as well as 80,000 cubic yards of sediments and sludge. Some 70 million gallons of wastewater in the lagoon and the on-site ground water were laden with volatile organic compounds (VOCs).

The surrounding area is primarily rural and agricultural, with a

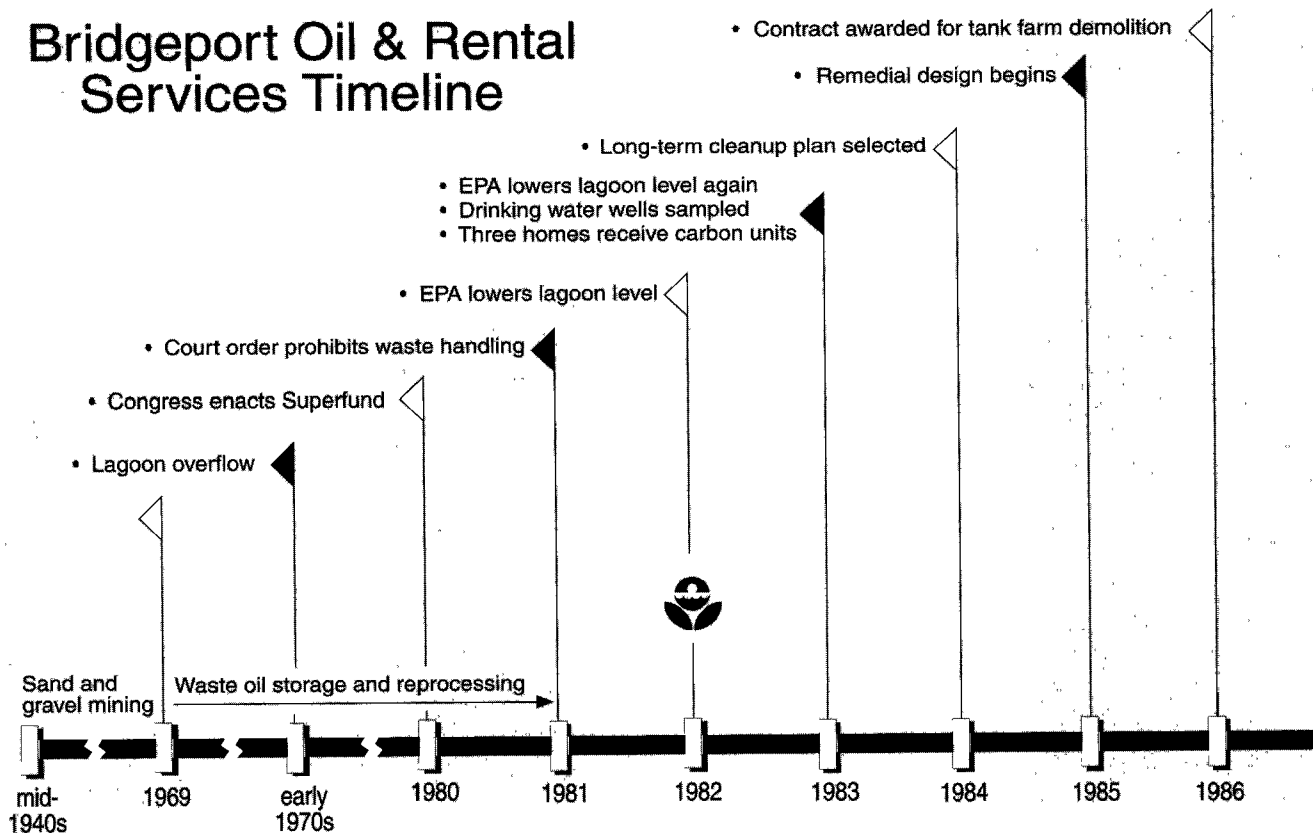
peach orchard on the site's western border. Cedar Swamp, a tidal wetland, empties into Little Timber Creek, a tributary of the Delaware River two miles north. The lagoon's dikes could have overflowed from even modest precipitation or a large snow melt. On one occasion in the early 1970s, they did overflow, spreading contaminants onto three acres of nearby land and causing extensive damage to plant life.

The site is perched atop the uppermost

portion of the Potomac-Raritan-Magothy aquifer system, one of New Jersey's major sources of potable water. The aquifer supplies drinking water for about 800 people in Bridgeport; 10 domestic water supply wells are within 1,000 feet of the site. A truck repair garage and three homes are within 300 to 800 feet.



Bridgeport Oil & Rental Services Timeline



Waste Oil and Spent Chemicals Threaten New Jersey Drinking Water

In the mid-1940s, following World War II, a sand and gravel mining company started excavations to construct new buildings. Large open pits were left behind where the earth lay raw and exposed to the elements. Ground water and precipitation filled the pits over time, forming a network of lagoons on the abandoned property.

In 1969, Bridgeport Rental and Oil Services, Inc. began waste oil storage and reprocessing operations. The owners built large storage tanks and buildings and began leasing space for spent commercial solvents and industrial wastes. The lagoon brimmed with chemical wastes and eventually expanded to 13 acres. A court

order finally stopped all waste handling activities in 1981.

Congress had just passed a new law to deal with abandoned or uncontrolled hazardous waste sites. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, commonly known as "Superfund," enabled EPA to start identifying and cleaning up thousands of these sites nationwide. Superfund imposed a new excise tax on crude oil and chemical feedstocks to pay for the program.

Site conditions demand emergency action

When state officials first contacted EPA, several tank spills had already been recorded, including a

significant overflow in the early 1970s. VOCs, including benzene, vinyl chloride, toluene, and xylene were found in the ground water. Ether, naphthalene, and the heavy metals lead and zinc also were present in significant quantities.

In 1982 and again in 1983, EPA pumped out and treated water from the lagoon to prevent another overflow. After discovering that local drinking water wells had been contaminated, EPA sampled 33 private wells and installed activated carbon units on the faucets in three of the homes. Following public comment periods and community meetings, EPA selected a long-term remedy in December, 1984.

The plan included construction of a new water supply system for

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A & NJDEP complete public water supply extension

- Buildings, tanks, and drums removed
- Wastewater plant treats lagoons wastes
- Ground water study begins

- Contract awarded for lagoon excavation

- Meetings held on trial burn

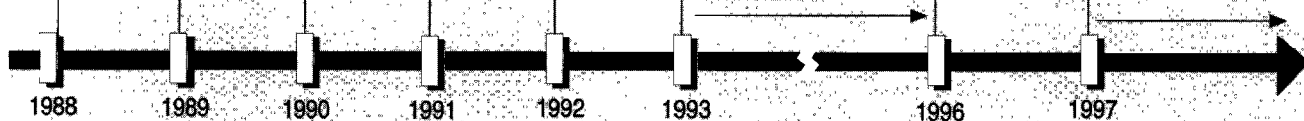
- Incineration begins following completion of trial burns

- Additional drums and debris found in lagoon

- Final stages of site restoration and demobilization

- Ground water and wetlands assessment continues

Drum removal and incineration



king Water

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potentially affected homes and off-site removal of tanks and drummed wastes. The oily waste and lagoon sludge, as well as buried drums needing excavation, would be incinerated. An on-site treatment plant would purify contaminated lagoon water and thus prevent further spread of a known contaminated ground water plume. In 1988, EPA initiated a second phase study to determine the best comprehensive ground water cleanup and final lagoon closure strategy.

In 1985, EPA joined forces with the New Jersey Department of Environmental Protection (NJDEP) to provide an alternate water supply to 15 affected homes using the existing Bridgeport system. The U.S. Army Corps of Engineers (COE) also agreed to help EPA and awarded a contract in September, 1986 to demolish the tank farm. That work included removal of 100 tanks and process vessels containing more than 350,000 gallons of oils, sludges, and other hazardous liquids. The buildings were torn down and disposed of off site along with drums and tons of other site debris. As part of the work, COE also constructed an aqueous wastewater treatment system that handled millions of gallons of lagoon water. COE completed its action in April, 1988.

Lagoon wastes incinerated

Efforts to address the massive lagoon wastes began in earnest in March, 1989 with transport of a mobile incinerator to the site.

Developing a plan for the trial burn of PCB materials and other organics involved more than a year's worth of investigation and evaluation, including a health risk assessment, air quality analyses, a field sampling plan, and other information addressing the incinerator's efficiency. Reviews by federal and state officials were finally completed and approvals issued in November, 1991. Over a four-year period, the thermal destruction facility incinerated more than 172,000 tons of contaminants, including lagoon sediments and sludges, oil, levee material, area soil, and various debris.

Lagoon excavation uncovers unexpected drums

Early in 1992, crews discovered a large quantity of municipal garbage submerged in the lagoon. As the year went by and the lagoon level dropped, hydraulic dredging was impeded by large numbers of metal drums and other debris. In July, workers spotted a drum that



The contamination of Cedar Swamp, a tidal wetland near the BROS site, probably occurred over many years, causing subtle but insidious changes. One of the most recognized birds in the wetland, the **great blue heron** stands around four feet tall and is a master of ambush. Small fish, amphibians, and reptiles mistake those long legs for sticks, swim too close, and get stabbed with the heron's dagger-like beak. But contaminants in the food chain biomagnify in concentration from algae to shellfish, to fish, to fish-eating birds and mammals. Population losses of this exceptional bird can be linked to chemicals stored in the fatty tissue that are passed between species. The comprehensive wetlands assessment should begin in the spring of 1998.

spontaneously began venting a white vapor cloud. Tests showed that the drum contained pure sulfu-

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Crews eventually removed and disposed of 5,200 floating or buried drums.

ric acid that vented when water seeped in. On two other occasions, drums with identical markings had to be removed using special handling and sampling procedures.

Drum removal took more than a year and in October, 1993, workers found many intact drums that bore identifying markings. Since responsible parties were still being sought, a sampling and documentation protocol was developed to assure collection of evidence that would link the wastes to the parties who contributed them to the site. Drum removal then required the long and painstaking process of exterior cleaning, photographing, and sample collection. Crews eventually removed and disposed of 5,200 floating or buried drums.

Due to the large amount of debris on the lagoon bottom, the original plan to hydraulically dredge the wastes was abandoned. When land-based excavation equipment could no longer plumb into the lagoon, a new excavation plan was needed. Excavation was further complicated when the bottom soil was found to be structurally unstable and unsafe for ground-based equipment. A number of alternate methods was considered until an amphibious excavator or "swamp hoe" was located. This device was capable of floating on the lagoon, but backfilling created a huge mud wave that grew so large that work could not continue. To isolate the mud wave, a geogrid "bridge" was

installed in late August, 1995. Additional backfill could then be placed over the grid in thin layers without pushing the wave further, allowing the soft sediments to remain in place. Underlying lagoon materials were sampled to verify that contaminants from sediments and sludges had been removed.

Treatment plant processes millions of gallons of wastewater

As part of the overall remedial effort, other crews focused on construction and operation of a wastewater treatment plant. More than 20 million gallons of liquid lagoon wastes had been treated as part of the site stabilization phase.

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An additional 190 million gallons of lagoon water were conveyed through the treatment system to remove volatile organic and inorganic contaminants. Treated water was discharged to Little Timber Creek with continuous monitoring and periodic sampling to ensure safe effluent limitations. Because of the enormous volume, the treatment plant operated to maintain the lagoon water level at or below the natural ground water level. The treatment plant remains

on site for possible use in the ground water phase of the site remedy.

Following verification testing, crews backfilled the bottom portion of the lagoon, including areas below ground water level. The uppermost portion of the lagoon was backfilled with a blend of ash, clean levee material, and clean fill totalling almost 475,000 tons. The surface was then graded, covered with topsoil, and seeded with grass.

Current and future activities

EPA initiated a second phase study for ground water in 1988. Since then, scientists have conducted extensive investigative field work and collected numerous ground water and wetland samples. To date, results show that contaminated ground water has migrated at least 1,500 feet from the site in a southeasterly direction. More sampling and field work are needed to perform an extensive engineering evaluation for some of the remedial alternatives under consideration.

Success at Bridgeport Rental & Oil Services

State and federal efforts combined to stabilize, drain, and backfill an enormous lagoon once brimming with oily contaminants and spent chemicals. More than 20 years of waste disposal had made this site extremely dangerous. Incineration of sediments and sludges proved to be both technologically and economically sensible. Remedial investigation and engineering assessment work continues on site to determine how best to protect fragile wetlands nearby from further destruction.

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