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15) GURLEY OIL PIT, AR

Gurley Oil Pit was a disposal site for secondary oil refining wastes generated by the Gurley Refining Company (GRC) from 1970 to 1975. The pit was excavated prior to 1970 and then divided into three smaller waste disposal cells, with the addition of two cross-levees, in the fall of 1970. The unlined pit is approximately 250' X 750' and 9 to 15 feet deep. The site is approximately 1.2 miles north of Edmondson, Crittenden County, Arkansas and occupies 3.25 acres. The site lies entirely within the watershed of Fifteen Mile Bayou, a tributary of the St. Francis River which is a tributary to the Mississippi River. The site is located within the 100-year flood plain of Fifteen Mile Bayou. There are three major aquifers in Crittenden County, the "500-foot sand," the "1480-foot sand," and the Wilcox Sand. The Midway Water Association, which supplies the nearest residences with their water, obtains water from a 1,585-foot deep well completed in the Wilcox Sand approximately 2.2 miles southeast of the site.

A waste disposal permit was granted to GRC by the Arkansas Department of Pollution Control and Ecology (ADPCE) on September 20, 1970. From October 1970 until an undetermined time in mid to late 1975, GRC disposed of acid sludges and spent diatomaceous filter materials in the pit. In May 1975, an inspection by ADPCE revealed that GRC was discharging contaminated stormwater from the pit into Fifteen Mile Bayou without treatment; as a result, GRC was charged with, and convicted of, violating its disposal permit. GRC was given one year to implement site cleanup and remedial measures. In October 1975, GRC closed the part of their refining operation that generated the wastes disposed of at the site.

In December 1975, GRC returned its waste disposal permit to ADPCE stating that waste disposal at the site had ceased and the site was secure. While there is some indication that illegal waste disposal occurred at this site, the primary waste disposed of at Gurley Oil Pit was sludge generated from the secondary refining operations of GRC.

Wastes were disposed of in one of the three cells of the pit. The northern cell is filled with oily waste and sludges. The center and south cells contain primarily water with some sludge on the bottom. In addition, an oily layer covers a portion of the water surface in the center and south cells. Data suggests that approximately 432,000 cubic feet of sludge are present in the pit (all three cells). Additionally, it is estimated that the middle and south cells contain 4.1 million gallons of contaminated stormwater.

After abandonment of the pit in 1976, oily discharges into Fifteen Mile Bayou were periodically reported by area citizens. During 1978, personnel from the U.S. Fish and Wildlife Services (USFWS) reported to EPA and ADPCE that chronic overflows from the pit due to accumulated stormwater had resulted in damage to fish and waterfowl in the bayou. On July 12, 1978, GRC responded to EPA Region VI Headquarters' request to contain and clean up stormwater discharges. GRC vacuumed

oil from areas outside the pit and pumped untreated stormwater into Fifteen Mile Bayou. With assistance from EPA Region VI, ADPCE halted the discharge of contaminated stormwater to the bayou by GRC. On July 19, 1978, an EPA-retained contractor initiated an effective pollution contingency cleanup. By July 28, 1978, the spill was cleaned up and water levels in the pit lowered sufficiently to provide adequate capacity for further rainfall.

During the week of April 1979, heavy rainfall caused extensive flooding in Fifteen Mile Bayou. In response to citizen complaints, an ADPCE inspection revealed that 400,000 to 500,000 gallons of oil contained in the pit had been washed onto adjoining farmland, borrow ditches, adjacent roads, and into Fifteen Mile Bayou some six miles downstream of the site. EPA Region VI ordered a contractor cleanup of the site under Section 311(c) of the Clean Water Act. Periodic pumping of stormwater from the pit continued during the summer and fall of 1979.

The site has remained stable throughout this period and no spills have been reported. Data indicate the presence of a complex mixture of oil and oil waste. In addition, numerous volatile organic and inorganic substances were found in the sludge and surface soil. No significant level of contaminants were present in the subsurface soil samples. Although both organic and inorganic contaminants were detected in the ground water, they were present at low concentrations. Lead, barium, and zinc are the contaminants of greatest concern at this site.

Remediation activities at this site have been planned. Contractors will be invited to bid on performing remediation activities in the near future. No remediation actions have been performed to date and no cost information was obtained.

SOURCES

1) Gurley Oil Pit Feasibility Study.

16) IMPERIAL OIL COMPANY, INC./CHAMPION CHEMICALS (IOC/CC), NJ

The IOC/CC site in Morganville, New Jersey served as an oil reclamation facility from approximately 1950 until the early 1980's. The site is currently used as an oil blending facility. Although the site occupies 15 acres, only 4.2 acres are considered "active." The IOC site is located above the Englishtown Aquifer one mile south of Lake Lefferts, which is used for swimming and other recreational activities. Wetlands are present to the north of the site.

In 1917, Stratford Chemical Company began producing calcium arsenate and arsenic acid. In the mid-1940's, ownership transferred to S.B. Penick and Company, which produced flavors and essences until 1949. Champion Chemicals acquired the property in 1950 and soon began oil reclamation operations. Since 1969, Champion has leased the property to Imperial Oil Company. Currently, IOC runs an oil blending operation at the site which involves the mixing and re-packaging of unused oil for delivery. Raw product (refined clean oils) are delivered by truck and transferred to on-site above-ground storage tanks.

The IOC had one ROD completed and signed in September, 1990. Spills and lax management practices were common at the site. Sources of contamination include oil water separators, the sludge waste pile, the tank farm, floor drains, the septic and leech field, the drum washing area, the waste dump, and an off-site waste dump.

The process of reclamation involved washing the used oil with caustic in certicle process tanks to remove the sludge and impurities. The washed oil was then distilled to separate the heavy oil from the gasoline. The oil was then passed through the clarification process. This process involved mixing the oil with the diatomaceous earth (filter clay) in large holding tanks where the diatomaceous earth was allowed to settle to the bottom and the oil was skimmed off the top. The filter clay was used to remove the heavy metals (tetraethyl lead, zinc, iron, etc.) that may have been present in the waste oil. In 1975, there were 56 above-ground oil storage tanks with a total capacity of 963,000 gallons. Some of these tanks were subsequently removed. Some spilled oil in soils and ground water is commingled with arsenic, which appears to be the result of the pre-used oil production process at the site. The widespread presence of PCBs on the site is closely linked to used oil contamination. Other contaminants at the site include lead, barium, and phthalates.

A New Jersey Department of Environmental Protection inspection in April 1981 discovered that transfer hoses from supply tankers were reportedly allowed to drain their contents to the crushed stone base of the tank farm. In June, 1981 tanks also appeared to be discharging oils and additives to the ground around the tanks. In 1976, a consultant excavated contaminated soil and replaced it with clean sand in the area of the oil/water separators. Ground-water contamination with TCL organics and inorganics is

present.

As a part of the remediation effort, approximately 3,700 cubic yards of contaminated soil is to be excavated. Primary constituents in the soil include petroleum hydrocarbons, heavy metals, and PCBs. A waste filter clay pile also exists with an estimated contaminated soil volume of 1,000 to over 3,600 cubic feet.

As mentioned above, remediation activities involve removing contaminated soil from the site to be treated and disposed. Also, a fence will be placed around the perimeter of the contaminated soil areas, and affected wetlands will be restored. The cost of the approved remediation plan was estimated to be $6,889,000.

SOURCES

1) Remedial Investigation of Imperial Oil/Champion Chemicals Site, Morganville, New Jersey, Draft Report, Volume 1. June 1990.

2) Record of Decision for the Imperial Oil Company, Inc./Champion Chemicals. September 1990.

17) INTERSTATE POLLUTION CONTROL/ROTO ROOTER, IL

Interstate Pollution Control (IPC) operated a hazardous waste storage and waste oil recycling facility from 1974 to 1982. Waste oils, solvents, and cyanide-containing plating wastes were hauled by the company and stored on-site in tanks (it is unknown whether the tanks were above or underground) and drums. IPC also used waste oils as dust suppressants on neighboring roads and at the People's Avenue Landfill. The IPC site occupied 4.5 acres in a combination residential and industrial area in Winnebago County, Rockford, Illinois, 0.5 miles east of Rock River in a sand-gravel flood plain.

IPC initiated operations at this facility in June of 1971 as a waste oil recycler, industrial waste storage facility and hauler. In October of 1971, a cyanide incinerator was installed that was capable of burning 3,500 gallons of cyanide waste per week. IPC is thought to have accepted hazardous and non-hazardous wastes through 1984. Manifests dating from 1979 to 1984 show that approximately 5,500,000 gallons of hazardous waste and 500,000 gallons of non-hazardous waste were shipped to the site during that time. After 1988, only waste oils were accepted for storage and recycling. As of 1989, the facility was still operating as a waste oil reclamation facility.

This site was placed on the NPL in 1988. In 1990, EPA was planning action on the site including construction of a fence to restrict the area, placing a surface cover on a lagoon, conducting sampling and testing at the site, and securing the openings of the underground storage tanks (USTs). A partial consent decree was negotiated that included plans for an RI/FS at the site. A Site Activity Report and a Technical Memorandum for the Remedial Investigation were done in 1991.

Waste oils, including solvents, cyanide wastes, acids and bases were transported to the site, stored and treated. Waste oils were kept in tanks and drums. There were 21 tanks with an estimated capacity of 400,000 gallons. Waste oils reportedly went to one of 4 underground tanks for reclamation. Residues from the used oil reclamation process were stored on-site. An unlined cyanide lagoon (50'x 200') was built in the late 1970's to contain the wastes from the cyanide-containing materials handled at the site. On one occasion, IPC mixed incompatible wastes (chromic acids and cyanide sludges within an UST), causing an extremely hazardous situation. The exact situation was not described.

EPA documents indicate a history of poor operating practices, including unlined surface impoundments, leaking storage tanks, and leaking drums. Site inspections found that soil contamination by cyanide was wide-spread throughout the site. Besides cyanide, priority pollutants found throughout the site included cadmium, chromium, copper, lead, nickel, and zinc. Other contaminants included 1,1-dichlorethylene, 1,1-dichloroethane, trans-1,2-dichloroethane, 1,1,1-trichloroethane, trichloroethylene, and tetrachloroethylene. Ground-water monitoring detected manganese, oil, grease, and phenols.

INTERSTATE POLLUTION CONTROL/ROTO ROOTER, IL (continued)

Remediation of contamination included the following actions:

- removal of 1200 drums of waste oil, some liquid, and 120 to 200 cubic yards of cyanide-containing soil from the lagoon (1979),
- excavation of sludge and 3 to 4 inches of soil (1980),
- filling of the lagoon with soil and concrete (1980),
- removal of 80 cubic yards of contaminated soil (1980), and
- initiation of construction of a soil cap for the lagoon (1980).

By 1981, the site appeared to be cleaned up, but oil soaked soil remained in some areas. The cost of the excavation and proper disposal of the sludge and all other materials from the lagoon was estimated at $385,000.

SOURCES

1) Ecology and Environment, Site Activity Report for the Interstate Pollution Control/Roto Rooter Site. 1991.

2) Golder Associates Inc., Technical Memorandum for the Remedial Investigation, Interstate Pollution Control Site, Rockford, Illinois. June 1991.

3) Illinois Environmental Protection Agency, Memorandum from R.L. Munger to R.A. Wengrow. March 1, 1984.

4) Interstate Pollution Control/Roto Rooter, PRP Meeting notes. July 16, 1990.

5) U.S. EPA, Region V, Final Strategy Determination. September 15, 1980.

18) LENZ OIL SERVICE, INC., IL

Lenz Oil operated an oil and solvent storage and transfer facility at this site from 1966 to 1986. The site is located at Route 83 and Jeans Road, DuPage County, Illinois. It is bounded by railroad tracks and roads on the flood plain of the DesPlaines River. The surrounding area is a mix of commercial, light industrial, residential, and undeveloped land.

Lenz Oil collected waste oil from local service stations and small businesses. The oil was temporarily stored in tanks and shipped to local recyclers. Lenz Oil also supplied oils and construction materials for road work projects. Sometime before 1980, the business expanded to include waste solvents. The peak years of operation were 1980 and 1981, during which time the facility handled larger volumes of waste oil than of solvents. Although waste oil included transformer oil and, therefore, possibly contained PCBs, the oils were not tested or segregated at the site. Lenz Oil stopped accepting hazardous waste (spent solvents) in 1984.

Lenz Oil was cited by the Illinois EPA for mismanagement of wastes and ordered by the State of Illinois to clean up the site and file closure and compliance plans. Lenz Oil began some cleanup operations, but filed for bankruptcy shortly thereafter. A ROD requiring cleanup response actions was issued in 1986 and amended in 1987. IEPA undertook cleanup action in 1986. The PRPs and U.S. EPA are currently preparing RI/FS's to address ground water and soil contamination.

Storage facilities at the site included: three 30,000 to 80,000 gallon underground, unlined, concrete storage tanks; fourteen low to medium capacity above-ground or partially buried steel tanks; six low capacity steel tanks; nine tanker trucks (total truck capacity of more than 30,000 gallons); and 200 drums. It is not clear what substances were stored in the aforementioned units. However, it is known that three surface impoundments made from porous cinder-type materials were used for hazardous waste storage.

Remediation of the site included:

- pumping all contents of the surface impoundments into tanks;
- recontouring the area around the surface impoundments to halt the spreading of potentially hazardous liquid;
- blocking the flow of surface water runoff to the drainage ditch;
- shredding and incinerating all drum, tank, and tank truck contents;
- shredding and incinerating all drums;
- excavating and incinerating 21,000 tons of soil in the vicinity of the underground storage tank farms and surface impoundments to a depth of 9 to 11 inches; and,
- making municipal water available to residents formerly using nearby wells.

LENZ OIL SERVICE, INC., IL (continued)

Approximately 75% of the site was excavated to varying degrees. Other measures that were ordered in the ROD were not carried out, including construction of a slurry wall and a cap and grass cover for the surface impoundment.

No cost information for these activities was available.

SOURCES

1) ERM, Technical Memorandum No.1, Description of Current Situation, Remedial Investigation, Phase I, Task I. February 5, 1991.

19) MACON/DOCKERY (AKA CHARLES MACON LAGOON AND DRUM SITE), NC

The Macon/Dockery site is a 17-acre former waste oil recycling and antifreeze manufacturing facility located on State Road 1103 in a largely rural section of Richmond County, North Carolina. The facility operated from 1979 through 1982. The population centers nearby the site include Rockingham (3 miles to the north), Cordova (1.5 miles to the northeast), and Cheraw (20 miles to the south, along the Great Pee Dee River).

The site is located in the Pee Dee River Basin near the Coastal Plain/Piedmont physiogeographic boundary. The layer of residual soil and saprolite on competent bedrock at the site is estimated at 30 to 95 feet thick. The bedrock is granite and gneiss. The unsaturated zone of the soil ranges from 25 to 35 feet thick.

Four distinct hydrogeologic units are present at the site. In order of descending depth, these units include: 1) a perched water table; 2) a shallow saprolite aquifer; 3) a transition zone of partially weathered rock; and 4) a bedrock aquifer. The ground water flows to the west-northwest.

The site comprises two non-contiguous, independently owned parcels of land: a 6-acre tract and a 1-acre tract. The site slopes toward the Great Pee Dee River drainage basin, located one mile to the west. The land between the site and the river constitutes a wetlands area and contains the nearest downslope stream, 1,050 feet from the site.

In May 1, 1979, the owner incorporated two waste disposal-related corporations. These corporations conducted a waste oil recycling business under the names of Macon Farms Trucking, Inc. and Macon Machine Company. Between May 1979 and May 1981, Macon Farms Trucking transported waste to the site and Macon Machine Company recycled the waste oil. In June 1980, Macon Farms Trucking was sold off and moved by the new owners. In May 1981, the owner leased the recycling plant to C&M Oil Distributors, which operated until March 1982.

The site was placed on the NPL in July 1987 and a RI/FS work plan for the Macon/Dockery site was prepared in 1989.

At the Macon site, incoming waste oil was stored in 12 lagoons. An October 1980 site inspection found that the lagoons were overflowing and contaminating the surrounding ground. The oil and sludge in the lagoons contained lead, chromium, and barium at levels considered hazardous under RCRA. Inspectors also discovered 175 55-gallon drums in various stages of deterioration, many of them broken or leaking. These drums contained wastes such as methanol, toluene, vinyl thinners, epoxy, enamels, lacquers, ethyl acetate, caustic soda, and methylene chloride. Hazardous wastes were also stored in one unlined impoundment.

MACON/DOCKERY (AKA CHARLES MACON LAGOON AND DRUM SITE), NC (continued)

EPA conducted a RCRA compliance inspection in July 1981 and noted 10 violations of RCRA regulations. In March 1982, all wastes were removed from the site. Hazardous materials (their makeup is unknown) found at the site were contained in 2,100 55-gallon drums, approximately 10 bulk tanks, and 11 surface impoundments (8 of which were unlined).

No uniform vertical or horizontal distribution of the residual chemicals is apparent at the site. Rather, chemical residuals in soils and ground water are concentrated in localized areas related to former storage units (drums and lagoons).

Ground-water contaminants are primarily trace amounts of VOCs in localized areas in the uppermost aquifer. Slightly elevated concentrations of inorganic constituents (including metals) have been found in ground water as well.

Vadose zone soil samples indicate low concentrations of residual VOCs and inorganic compounds. However, only the VOCs under Lagoon 7 have the potential to impact ground water. PAHs are also present in Lagoon 10. Several vessels (i.e., tanks and vats) are present on-site. Approximately half of these contain mixtures of water, oil, tar, and solids. Of the samples taken, 3 were found to contain hazardous levels of lead; one tank exceeded the TCLP for lead by a factor of 3. Ground water and sediment samples taken at the site in early 1985, after intermediate removal activities were completed, detected trichloroethylene, barium, and toluene.

Remediation activities began at the site in November 1982, when 300 55-gallon drums and the contents of one lagoon were removed and two on-site monitoring wells were installed downgradient from the lagoon area.

EPA initiated a removal action in November 1983. Through this action, a total of 3,123 tons of waste and 137,000 gallons of oil were removed. In addition, rain water was pumped from 10 of the lagoons and dispersed on the land. Reusable oil was pumped from the lagoons and taken to an oil reclaiming facility. Oil and hydrocarbon sludges remaining in the lagoons were solidified, removed, and disposed of in a RCRA-permitted hazardous waste facility. The lagoons were then filled, graded, and seeded for grass. One remaining lagoon was filled and covered with a 3-foot clay cap. Methanol-based anti-freeze stored in 3,000 1-gallon containers was transferred into 55-gallon drums and solidified on-site. Materials in the remaining drums were solidified and delivered for disposal at a RCRA facility. An additional 508 drums were removed. In addition, 246 calcium hydroxide flare charges were removed.

Removal operations at the Dockery site commenced in January, 1984, when 709 tons of waste material were removed from the site in an operation similar to that

performed at the Macon site.

Estimates for the present worth costs to remediate the site range from $140,000 (all Operation and Maintenance costs) for the no action alternative to approximately $9 million for more intensive treatments such as ground water extraction.

SOURCES

1) Proposed Plan Superfund Fact Sheet for Macon/Dockery Superfund Site. July 1991.

2) Remedial Investigation Report for Macon/Dockery Site RI/FS. Undated.

3) Potential Hazardous Waste Site Inspection Report for Macon Property. November 1983.

4) Potential Hazardous Waste Site Inspection Report for Dockery Property. November 1983.

20) OLD INGER, LA

The Old Inger site is an abandoned oil reclamation plant located between Louisiana Highway 75 and the Mississippi River levee in Ascension Parish, Louisiana. The site is adjacent to the Mississippi River and overlies the Gonzales Aquifer, both of which are major sources of public drinking water.

The facility operated as an oil refinery from 1967 to 1976 and as an oil reclamation facility from 1976 to 1978, at which time it was abandoned following a large spill in March 1978.

A Phase I and Phase II Remedial Action/Feasibility Study have been completed at the Old Inger site. Historically, waste sludges and oils were disposed of in a 33,000-gallon, on site, unlined lagoon, diked containment areas, and in above-ground storage tanks. A large spill occurred in March 1978, after which the facility was abandoned. The quantity of used oil that was spilled in March 1978 is not documented. To date, the only remedial action that has taken place at the Old Inger site is an Emergency action in 1983 to prevent an on-site lagoon from overflowing.

There is a considerable amount of contaminated media at the Old Inger site, including about 3,600 cubic yards of heavily contaminated soil in the lagoon and another 8,400 cubic yards of slightly contaminated soil in the lagoon. In an adjacent swamp, there are 20,000 cubic yards of contaminated sediment, though this sediment is less contaminated than the lagoon soil. A buried waste area contains 12,000 cubic yards of contaminated soil. Trace amounts of some hazardous compounds (ppb) have been found in the ground water to a depth of 75 feet. The contaminants are consistent with an oil reclamation facility and do not include PCBs, dioxins or any radioactive compounds.

Though no remediation activities have taken place at the site, it is estimated that if clean-up operations are commenced, the total cost will be $3 million for on-site land treatment.

SOURCES

1) Office of Emergency and remedial Response, Final Report on Old Inger No Migration Demonstration. June 30, 1988.

2) Old Inger Hazardous Waste Site Phase I Feasibility Study, D'Appolonia Waste Management Services of Louisiana with Gulf Drilling Company. 1983.

3) Old Inger Abandoned Hazardous Waste Site Phase II Feasibility Study, D'Appolonia Waste Management Services of Louisiana with Gulf Drilling Company. May 1984.

21) PEAK OIL COMPANY, FL

Peak Oil Company functioned as a used oil re-refinery from August 1954 to 1979. In addition, Peak Oil disposed of used oil and wastes from the re-refining process. Since 1979, it has been limited to filtering and blending waste oil for resale. Some (but not all) of the materials accepted by Peak Oil for recycling include used crank-case oil, hydraulic fluid, and transformer fluids. The site is 4 acres in size and is located on State Road 574, in Hillsborough County, Tampa, FL 33614. Along with various small ponds and ditches/trenches on the property, there is also an undeveloped wetlands 1/4 mile from the site; although, the intermediate aquifer is not located underneath the Peak Oil facility.

The Bay Drum Company was listed as part of this Superfund Site, but it is unclear as to whether Bay Drum was located on the Peak Oil site proper or just near it (the company no longer operates). Bay Drum was a drum recycling facility and, therefore, did not necessarily deal with used oil. It consisted of several large steel sheds which housed the drum washing, storage and painting areas. The water used in the processes was recycled, but some did overflow into the nearby 1/2-acre pond. Specific information about the size, location, and operations were unavailable. However, it was stated that part of the property was leased to King's Scrap Metal and, as of 1983, that it resembled a junkyard with old transformers, a capacitor, and unidentified pesticides (in drums) present at the site. Reeves Wire Plant Property was also located east of the site. The RI/FS performed in 1992 did not specifically address whether contamination at Peak Oil could necessarily be due to Bay Drum, King's Scrap Metal, and/or Reeves Wire Division. However, it appears both from information and emphasis given in the RI/FS that the main contamination is due to Peak Oil, which appears to have performed solely used oil processes.

Peak Oil's main waste disposal site was a surface impoundment (sludge pond), which measured 80 X 100 feet and contained 6 1/2 to 7 feet of acid sludge from the re-refining process and waste oil. An acid/clay purification and filtration process was used to re-refine the oil and this process generated low pH sludge and oil-saturated clay. Peak Oil also utilized three lagoons to dispose of the sludge and other process related wastes. At some point (dates are unavailable) Lagoons #1 and #3 were backfilled, and only Lagoon #2 remained as a main disposal site. The water on the primary sludge pond surface would run off into an oil/water separator, and the "oil-free" water would then drain into several ponds and eventually off-site via ditches. Consequently, the ground off-site was soggy, and in numerous areas around the plant, several inches of waste oil stood on unlined soil.

In addition to the ponds and lagoons, two large tanks were identified in the field, possibly containing propane and liquid propane gas (LPG). Several company employees had reported that spills and leaks continued to occur from on-site tanks, tanker trucks and other on-site equipment after the 1979 shift to blending and filtering. Past

employees also stated that, in spite of environmental regulations to the contrary, some wastes continued to be disposed of in on-site lagoons after the shift to blending and filtering.

On the Peak Oil site, there are four possible sources of contamination:

1) Peak Oil Company, including acid sludge pond and possible contamination from spillage and leakage;
2) Bay Drum Company (no longer in operation), including wastewater holding pond, previous drum storage area and any drums remaining on-site;
3) King's Scrap Metal yard;
4) Reeves Wire Plant adjoining the eastern property line of Peak Oil Company.

As of February 1992, the investigation at Peak Oil had only reached the RI/FS stage. No cost information was found.

From November 1986 to October 1987, EPA utilized a mobile incineration unit to treat 4,000 cubic yards of acidic PCB sludge from Lagoon #2, thereby producing 6,000 cubic yards of ash which remained on-site. In 1988 and 1989, EPA removed 120,000 gallons of residual tank liquids, 500 cubic yards of tank sludge, 70,000 gallons of contaminated tank water, and 22,000 gallons of tank oil containing PCBs. In September 1990, EPA continued the removal action by mixing soil previously excavated with tank sludge and removed it for disposal off-site (no volumes available). In 1992 when the RI/FS was begun, the site contained one active lagoon (#2), two former lagoons (#1 and #3), three ponded areas and two large warehouses.

There was visible oily residue over the entire thickness (12 foot depth) of surficial sand in the two former lagoons, with a concentration of up to 5% at a 4 to 6 foot depth. Elevated concentrations of toluene, ethylbenzene, xylenes, chlorinated organics, and naphthalene were identified. The highest metal concentrations were lead (1.1 - 2,950 ppm), zinc (1.5 - 2,410 ppm) and barium (0.61 - 460 ppm). Thus, the soil contamination at the site appears to be associated with petroleum wastes and inorganics, primarily the metals. While the surface waters appear to be free of such elevated contaminants, the sediment is contaminated with increased levels of lead (152 - 1,450 ppm), zinc (445 - 918 ppm) and silver. It is estimated that organic and inorganic chemicals have contaminated the following:

soil - up to 70,000 cubic yards (to a 14 foot depth),
sediment - up to 700 cubic yards (assuming a one foot thickness),
ash pile - up to 6,000 cubic yards.

SOURCE

1) Remedial Investigation Report for Peak Oil/Bay Drum Company. February 7, 1992.

22) PETRO-CHEMICAL SYSTEMS, INC., TX

Petro-Chemical Systems, Inc. was a waste oil disposal site until operations were discontinued at the request of Texas Water Quality Board (TWQB) in June 1970. There is suspicion of illegal dumping as late as 1979. The site is a 296-acre tract of land located in Liberty County, Texas approximately 1 mile east of FM 563 and 7 miles north of Interstate 10. Turtle Bayou runs through the Petro-Chemical boundaries.

The record indicates that waste oils were spread on roads at the site as a dust abatement measure. Specifically waste oils were spread on Frontier Park Road, which is contained almost entirely within the site. As a dust control measure, the waste oils were apparently stored, prior to use, in several pits on approximately 4 to 6 acres in the northwest corner of the Petro-Chemical Systems, Inc. site. Examination of aerial photographs of the site, testimony, photographs, and correspondence included in the Texas Water Commission records, indicate that wastes were deposited throughout the site. When disposal operations were discontinued, the disposal areas were covered. There were no other industrial activities at the site.

Remedial investigations at this facility have been completed and a pilot study for the remedial design is currently underway. Under a remedial action that was completed in August 1988, 5,900 cubic yards of soil were excavated and replaced with clean backfill. There are currently 4,000 cubic yards of highly contaminated soil and 22,100 cubic yards of moderately contaminated soil at the site. The primary contaminants are PAHs, benzene, Btecs, and metals. These contaminants also appear in ground water at the site.

The selected remedy, vapor extraction with air-stripping and catalytic oxidation, represents a combination of various soil and ground water remediation alternatives. The estimated cost for the remediation is $26,430,000 over 5 years.

SOURCES

1) Texas Water Commission, Petro-Chemical Systems, Inc. Frontier Park Road RI/FS. November 1986.

2) EPA Selection of Remedy. September 1991.

23) PETROLEUM PRODUCTS CORPORATION, FL

The Petroleum Products Corporation was utilized mainly as a re-refiner of used oil and other hydrocarbon products from 1958 to 1971. From 1971 until 1985, PPC was a marketer of re-refined oil and used the site as a used oil storage facility. The site is at least 2 acres in size and is located in Broward County, at 3130 SW 19th Street, Pembroke Park, FL 33009. The area around PPC is highly developed and contains a high-density residential population. This site also lies within a radius of influence of two major municipal well fields: Hallandale, 2 miles southeast; and Hollywood, 3 miles northwest of the site.

While it is suspected PPC handled other materials (perhaps solvents), no specific information was available on this topic. In 1970, the PPC facility converted from an active re-refining plant to a storage facility until its complete deactivation in 1985.

Inadequate practices (such as disposal of used oil recycling sludges in unlined pits) at the site lead to large amounts of petroleum hydrocarbons, heavy metals and chlorinated hydrocarbons contaminating the soil and to hydrocarbons contaminating the ground water. PPC utilized a sulfuric acid process to reclaim used motor oil. The sludges generated by this process were disposed in unlined pits which were 18 to 25 feet deep and covered an area of approximately two acres. PPC also utilized a lagoon to hold other by-products of their waste oil re-refining processes. These pits and one lagoon are of primary concern since ground water came into contact with the sludges in these units. As a result, oil was "floating" on the ground water at depths varying from 5 to 30 inches. To date, one RI/FS and one ROD have been completed for this site.

After 1971, PPC covered their storage pits and sold most of the property. The land was then developed as a commercial/industrial warehouse complex with some of the warehouses built over the abandoned pits. During periods of heavy rain, oily substances began to ooze into some of the warehouses from the underlying soil and between the cracks of asphalt parking lots in the complex. It was this "oozing" of oily substances that brought PPC to the attention of the EPA in 1985.

In 1985, EPA collected water and soil samples from the storage tanks on-site and in the vicinity of the tanks. They discovered increased concentrations of lead (244 ppm), oil and grease (1,000,000 ppm), and toluene (240 ppm) in the soil and water. A preliminary inspection estimated that the oil in the soil covered approximately 28,000 cubic feet. The volume of oil on the ground water (based on well measurements) was estimated at 210,000 gallons of which only 10-30% was free standing oil. This translates into approximately 20,000 to 60,000 gallons of oil that were recoverable. A contractor was hired to take off-site all contaminated water, oil, and drum sludge (after chemical testing had been performed). In addition, all tanks were to be emptied, cleaned and dismantled. The top six inches of contaminated soil were excavated and replaced with

new fill. At the end of this first removal action, 262 drums of sludge had been removed for disposal. A free-recovery system was installed to pump free oil from the ground water. To date, at least 6,900 gallons of oil have been recovered via this system.

In 1986, an RI indicated contamination was still present in the soil and ground water. In the primary pit subsurface area soils, shallow petroleum hydrocarbon contamination reached at least 8 feet deep and was 39 feet deep at the midpoint of the pit. Samples from soil borings of the disposal pits indicate the following elevated concentrations:

lead	311 -7,660 ppm
aluminum	432 -1,330 ppm
barium	70.2-1,500 ppm
chromium	6.9-33.9 ppm
copper	8.16-65.4 ppm
iron	390-3,180 ppm
zinc	6.75-943 ppm
methylene chloride	210-420 ppm
acetone	490-2,100 ppm
trichloroethene	170-360 ppm
toluene	170-220 ppm
ethylbenzene	100-190 ppm
total xylenes	170-1,000 ppm
naphthalene	230-3,500 ppm
1,2-dichlorobenzene	280-3,500 ppm
2-methylnaphthalene	36-1,100 ppm
PCB-1242	93-440 ppm
PCB 1260	0-290 ppm

The FS recommended a cleanup goal of 1000 mg/kg lead based on the risk assessment. This would require the removal of 108,060 cubic yards of contaminated soil. However, there are 213,080 cubic yards of soil which are contaminated with more than 100 mg/kg of lead.

The current Record of Decision chose "Relief from Water Infiltration and Recovery System Modification" as the most appropriate remediation. The cost will be $666,000, with an additional estimated operating and maintenance costs of $83,000.

PETROLEUM PRODUCTS CORPORATION, FL (continued)

SOURCES

1) Initial Record of Decision for Petroleum Products Corporation. October 5, 1990.

2) Initial Remedial Investigation/Feasibility Study. March 1988.

24) POTTER'S SEPTIC TANK PITS, NC

The Potter's Pits Facility disposed of septage, waste oil, oil spill residues, tank bottom sludge and creosote from 1969 to 1976. The wastes were disposed of in four septic tank surface impoundments. There were three distinct disposal areas, each 1 to 2 acres in size. The facility operated at Highway 71-76, Maco North Carolina 28451, in Brunswick County. The only water source of concern is the Chinnis Branch, which drains the open residential yard space and heavily wooded area on-site.

Currently, one RI/FS has been completed, along with a Phase II RI. Between 1969 and 1976, the waste disposal pits were operated without a permit. There were three separate sludge hauling and oil spill cleanup companies operating at the site, one disposing of wastes in each of the three "areas." Their disposal practices consisted of placing primarily waste petroleum products and septic tank sludges in shallow (2 to 8 feet deep) unlined pits, or directly on the land surface.

In May 1976, the North Carolina Natural and Economic Resources notified the owner that the oil disposal pit designated Area #2 had to be cleaned up. This pit was approximately 60 feet long, 20 feet wide, 2 to 3 feet deep, and filled with an estimated 2,000 to 3,000 gallons of waste oil. The only information available concerning the cleanup is that the oil was pumped out and the pit was covered with soil. In August 1976, failure of an earthen berm around another unlined pit resulted in a release of 20,000 gallons of oil into the Chinnis and Rattlesnake Branches, contaminating a distance of two miles. Containment booms were constructed, and the cleanup was completed by August 27, 1976. During that same time (August 6-9, 1976), the remaining 20,000 gallons of oil in the breached pit were pumped out and sent to Fort Bragg for recycling. Approximately 150 dump truck loads of oil sludge (from the bottom of the breached pit) and oil stained soil (from the spill area) were also excavated and shipped out for disposal off-site. The thick oil sludge that could not be pumped was mixed with sand and buried on-site.

Wachovia State Bank took over ownership of the Potter's Pits Facility in 1980, and was soon sold for residential development. On July 11, 1983, a private property lot owner notified North Carolina State personnel that he had uncovered creosote, oil spill residue, tank bottom sludge and septic sludge on his property. EPA ordered an Immediate Removal Action in March 1984. Consequently, 1,770 tons of oily sludge and contaminated soil were excavated and removed off-site for disposal.

POTTER'S SEPTIC TANK PITS, NC (continued)

Many of the contaminants found in water and soil samples from 1985 and 1991 are associated with creosote or coal-tar derivatives. The extent of contamination indicated below is restricted to the upper 15 feet of soil and the ground water encompassing the former disposal pits and Chinnis Branch only.

Soil Borings

Benzene	37 - 4300 ppb
Toluene	2 - 74,000 ppb
Ethyl benzene	up to 97,350 ppb
Methoxychlor	270 ppb
Barium	1 - 93 ppm
Chromium	1.2 - 23 ppm
Lead	1.1 - 1,300 ppm
Vanadium	1.8 - 35 ppm
Beryllium	0.53 - 2.2 ppm
Zinc	2.5 - 280 ppm
Nickel	2.1 - 8.1 ppm

Surface Soils

Hexachlorobenzene	980 ppb
Anthracene	2,800 ppb
4,4'-DDD	42 - 62 ppb
alpha - Chlordane	370 ppb
Dieldrin	21 - 35 ppb
Barium	8.6 - 150 ppb
Chromium	2.7 - 170 ppb
Lead	2.8 - 250 ppb
Vanadium	4 - 54 ppb

POTTER'S SEPTIC TANK PITS, NC (continued)

Subsurface Soils (19 - 21 feet deep)

Total xylenes	43,000 ppb
Ethyl benzene	4,000 ppb
Naphthalene	1,000 ppb
2 - Methyl naphthalene	190 ppb
Acenaphthalene	160 ppb
Fluorene	56 ppb
Phenanthrene	61 ppb
Carbazole	71 ppb
Barium	13 ppm
Lead	5.5 ppm
Manganese	26 ppm
Vanadium	15 ppm
Zinc	15 ppm

Ground water

Benzene	2 - 3,500 μg/l
Ethylbenzene	1 - 2,600 μg/l
Chlorobenzene	4 μg/l
Toluene	28,000 - 30,000 μg/l
Total Xylenes	98 - 28,000 μg/l
Barium	32 - 190 μg/l
Chromium	15 - 2500 μg/l
Lead	5 - 400 μg/l
Manganese	14 - 250 μg/l
Vanadium	8 - 100 μg/l
Zinc	8 - 47 μg/l
Aluminum	650 - 4,500 μg/l

Surface Water

Silver	5,000 μg/l
Cadmium	7,900 μg/l
Copper	850 μg/l
Lead	700 μg/l

POTTER'S SEPTIC TANK PITS, NC (continued)

The 1984 Immediate Removal Action cost $385,000. Currently, an ROD has not been published. See Table One for the eight possible alternatives and their costs.

SOURCES

1) Action Memorandum for Immediate Removal Action of Potter's Septic Tank Pits Site. March 15, 1984.

2) EPA Potential Hazardous Waste Site Preliminary Assessment. July 31, 1987.

3) Feasibility Study for Potter's Septic Tank Pits Site. April 1992.

4) Final Remedial Investigation for Potter's Septic Tank Pits Site. October 1991.

5) Remedial Investigation Report for Potter's Septic Tank Pits Site. April 1992.

6) Remedial Investigation Addendum Report for Potter's Septic Tank Pits Site. April 1992.

TABLE 1

Summary of Capital, O&M, and Present Worth Costs

Alternative	Capital ($)	Annual O&M ($)	Present Worth (5% Discount Rate) ($)
1. No Action	0	0	0
2. Institutional Controls	75,000	83,000	1,400,000
3. Ground Water Recovery and Treatment	721,000	462,000	8,200,000 - 8,600,000
4. Soil Removal and Off-Site Disposal	2,400,000 - 4,700,000	77,000	3,600,000 - 5,900,000
5. Soil Removal and Off-Site Disposal with Ground Water Recovery and Treatment	3,100,000 - 6,900,000	During Operations: 479,000 After Operations: 77,000	10,100,000 - 13,200,000
6. Soil Stab./Solid. and Containment with Ground Water Recovery and Treatment	3,100,000 - 5,000,000	During Operations: 502,000 After Operations: 102,000	10,500,000 - 12,400,000
7. On-Site Incineration with Ground Water Recovery and Treatment	9,400,000 - 12,400,000	During Operations: 479,000 After Operations: 77,000	16,300,000 - 18,700,000
8. On-Site Soil Washing with Ground Water Recovery and Treatment	8,100,000 - 11,800,000	During Operations: 479,000 After Operations: 77,000	15,000,000 - 18,200,000

25) PURITY OIL, CA

Purity Oil was a used oil collector, storer, re-refiner and disposal facility that occupied 6.8 acres in Fresno County, at 3281 South Maple Avenue, Malaga, California. This facility handled used oil only; there was no co-management with other wastes. The site is not near any surface water bodies; however, an irrigation canal exists along the southern boundary of the site.

Purity Oil stored used oils in 7 above-ground tanks, at least one underground storage tank, and in barrels. The underground tank was a concrete-lined vault that was used in the recycling process. The seven tanks were of the following sizes:

1) 44,000 gallons
2) 100,000 gallons
3) 53,000 gallons
4) 10,000 gallons
5) 5,000 gallons
6) 16,000 gallons
7) 11,500 gallons

It has not been confirmed that the tanks were leaking; however, it is likely that they could have been, since the tanks were not in good condition.

Two-thirds of the site is covered by unlined pits into which Purity Oil disposed of sludges generated by the recycling process. Soil was contaminated through either spills or leaks; it is not known which occurred. An emergency removal was conducted in 1985, during which 1,800 cubic yards of soil contaminated by oily wastes and tars were removed. This contaminated material was taken off-site; it is not known where it was taken. The major soil contaminant in terms of risk is lead; however, benzene and other carcinogens exist in the soil. In September 1987, 33,000 gallons of oil and water from one tank were removed. One tank was removed in 1990.

A plume of contaminated ground water extends 2,800 feet northwest of the site, and is 100 feet deep and 800 feet wide. There are nine volatile organics in the ground water, whose levels exceed drinking water standards.

One Record of Decision for ground water contamination was completed in September 1989, and a second Record of Decision for soil contamination is expected in September 1992. The remediation plan for ground water is to pump and treat. The remediation plan for soils 1 to 14 feet down is to cap the area(s) and install a slurry wall to 25 feet. The remediation plan for soils 14 to 55 feet down is to perform soil vapor extraction.

PURITY OIL, CA (continued)

The water table exists at 55 feet. There are no soil removals planned.

The cost for the RI/FS was $2,500,000 which includes the treatability studies. The remedial design cost for ground water is estimated to be $421,000. The remedial design for soils has not yet commenced, therefore no design cost estimate is available. Remedial action costs have been estimated. For ground water, the costs are estimated at $5,054,000 capital costs, and $915,000 annual operating and maintenance costs. The total for ground water adds up to $14,500,000. For soil remedial actions, the costs are estimated to be $17,023,000 capital costs, and $741,000 annual operating and maintenance costs. The total for soil remedial action is estimated to be $36,000,000. Both the ground water and soil remedial action cost totals are 30-year present worth estimates.

SOURCE

1) Phone conversation with Janet Rosati, Remedial Project Manager for Purity Oil, U.S. EPA, Region 9. July 7, 1992.

26) SAND SPRINGS PETROCHEMICAL COMPLEX, OK

The Sand Springs Petrochemical Complex operated as a used oil recycling and disposal facility. Although some oily wastes were generated and disposed of on the site dating back to the Sinclair Refining Company refinery operations, the primary source of used oil contamination occurred between 1960 and 1981. The site covers 200 acres in Tulsa, Oklahoma. It is adjacent to the Arkansas River on an alluvial flood plain. Alluvium thickness varies from 25 to 41 feet. The silt and fine/sand bedrock is 280 feet thick. Alluvium is flanked by terrace deposits upgradient. The ground water flows into the Arkansas River.

The site began operations as a petroleum refinery in the early 1900's. Various refiners operated on the site until 1947, when the Sinclair Refining Company ceased operations and the plant was dismantled. From the 1960's to the early 1980's, part of the site served as a used oil and solvents recycling facility with related storage and disposal operations. Baker Chemical currently operates a chemical processing plant on-site. Another industrial activity on-site is a transformer salvage/recycling operation.

The site has been divided by EPA into the Source Control Operable Unit (Source Control Unit) and the Main Site Operable Unit (Main Site). A Source Control Unit Record of Decision (ROD) was completed in 1987. A Main Site ROD was completed in June 1988. Over the years, storage and disposal operations in drums, tanks, and unlined pits occurred for a number of materials, including solvents and other refinery wastes. Used oil was stored in various containers and commingled with volatile and non-volatile organics, acids, caustics, chlorinated solvents, and sludges containing heavy metals. Total known waste volume (which includes oily wastes) includes 130,000 cubic yards of sludges and at least 700,000 gallons of liquid wastes.

Several on-site ponds and lagoons have a history of breaching their containment structures, including incidents such as dike walls breaching for one of the Glen Wynn lagoons (which contained an oily liquid hydrocarbon). Approximately 93 acres of oil-contaminated subsurface soil was identified on site. Contaminants include chrysene, anthracene, phenanthrene, pyrene, benzene, 1,1-difluorotetrachloroethane, toluene, phenol, nitrobenzene, fluoronapthalene, lead, and zinc.

A "no-action" ROD for ground water has been issued. The Main Source ROD was issued in June 1988, and remediation will commence next month. Remediation plans for the rest of the site is in design phase, and a chemical solidification stabilization unit is planned.

The total estimated remediation cost for the site is $70 million.

SAND SPRINGS PETROCHEMICAL COMPLEX, OK (continued)

SOURCES

1) Feasibility Study Report for the Operable Unit of the Sand Springs Petrochemical Complex. May 1, 1987.

2) Remedial Investigation Report, Main Source Operable Unit, Volume 1. March 1988.

3) Telephone Conversation with Ms. Susan Webster, Sand Springs Superfund Site RPM, USEPA. July 15, 1991.

27) SEALAND LIMITED, DE

The Sealand Limited site is located in Mt. Pleasant, Delaware and covers about 3 acres. The facility operated as a waste oil recycling facility from August 1982 to August 1983, at which time it was abandoned.

While operating, Sealand handled No. 4 and No. 6 oil, oil gas tar, off-spec creosote, ink oil waste, and oil cuff, an oil and water mixture. No other industrial activities occurred at the site. Left behind at the site were:

10 Steel Tanks	20,000 gallons each
6 Steel Tanks	12,500 gallons each
2 Steel Enclosed Hoppers	7,500 gallons each
1 Wooden Tank	8,000 gallons
1 Steel Tank	5,000 gallons
2 Steel Tanks	5,500 gallons each
Boiler	
Metal Building	
Concrete Pad	
320 55-Gallon Steel Drums	

The 20,000-gallon steel tanks contained finished product; the 12,500-gallon steel tanks contained incoming waste oil; and the two enclosed hoppers contained blending sludge.

To date, the only activity under CERCLA has been an Emergency Removal Action which was initiated in December 1983. EPA issued a "no action" ROD for this site and the site is being removed from the NPL.

The Emergency Removal Action was initiated when it was discovered that the wooden tank and numerous drums were leaking an oily sludge into the soil. Laboratory analysis of samples taken from tanks, drums, and soils indicated the presence of PAH compounds, creosols, solvents, and other organic compounds. No estimate of the amount leaked was available. The action consisted of the removal and treatment at a RCRA Subtitle C facility of 240,800 gallons of coal tar, 320 drums, and approximately 80 cubic yards of solid waste. The solid waste consisted of 30 cubic yards of debris from the wooden tank and anywhere from 50 to 92 cubic yards of sludge and contaminated material. An L-shaped trench was excavated along the southern and western boundaries of the storage area to aid in minimizing the horizontal movement of contaminants. The trench was filled with the clay; and, the excavated soil and the storage area were covered with one foot of clay and six inches of topsoil. The on-site storage tanks were cleaned and left on-site.

SEALAND LIMITED, DE (continued)

The remediation action described above cost a total of $755,070. Of this total, $484,570 was spent on management and operations while the remaining $270,500 was spent on transportation and disposal. The reluctance of disposal facilities to accept the oil waste due to its high water content prolonged the duration of site activities and increased disposal costs.

SOURCE

1) CERCLA Emergency Response/Immediate Removal Action Report, BCM Engineers. 1984.

28) SILRESIM CHEMICAL CORPORATION, MA

The Silresim Chemical Corporation operated the site as a chemical and oily waste recycling and reclamation facility between 1971 and 1978. Wastes were also consolidated for off-site disposal. The site covers over 16 acres (including the area of the contaminated ground water plume). Wastes were delivered to the site in drums, tanks trucks, railroad tanker cars, and other containers.

Co-managed wastes (including oily wastes, halogenated solvents, alcohols, plating wastes, pesticide wastes, and metal sludges) were treated using distillation towers, an evaporation system, an oil separator, and ancillary equipment. The facility handled approximately 3 million gallons of waste per year. It is not possible to differentiate used oil from other on-site wastes in terms of their storage or treatment.

Wastes handled at Silresim included chrome sulfuric wastes, aqueous sulfuric acid, aqueous hydrochloric acid, aqueous nitric acid (less than 50 drums), aqueous copper chloride, aqueous iron chloride, aqueous acetone, alcohol and methanol, miscellaneous laboratory wastes, chlorinated hydrocarbons such as 1,1,1-trichloroethane, hydrocarbon still bottoms and pure hydrocarbon mixtures, caustic wastes including ammonia, toluene with other hydrocarbon wastes, and wastewater containing pesticides. It is not known what containers or tanks in which these materials were stored. In addition, this facility stored the following materials in tanks of the following capacities:

1) acetone wastewater - one 20,000 gal and one 10,000 gal
2) methylene chloride - 20,000 gal
3) toluene and hexane - three 10,000 gal
4) toluene, benzene, acetone, methanol, butanolethanol and mineral spirit mixture in a 100,000 gal tank
5) #5 fuel oil - 5,000 gal
6) ethyl benzene - 10,000 gal
7) product alcohol - 5,000 gal
8) tetrahydrofuran product - one 3,000 gal, and one 1,800 gal
9) ethylene dichloride product - 3,000 gal
10) chlorinated materials - 4,000 gal
11) tetrahydrofuran and water - one 4,000 gal, and one 20,000 gal
12) hydrocarbon mixture for fuel - 10,000 gal
13) sodium hydroxide solution and tetrahydrofuran - 2,000 gal
14) perchloroethylene -2,000 gal
15) 1,1,1 - trichloroethylene - 1,000 gal
16) trichloroethane - 1,000 gal

17) mixed chlorinated materials - 1,000 gal
18) methyl tetrahydrofuran - 7,500 gal
19) tetrahydrofuran and caustic - 7,500 gal
20) latex wastes - one 3,000 gal and one 4,000 gal, one 2,000 gal, and two 1,000 gal
21) ethyl dichloride and ethyl benzene - 2,000 gal
22) sodium hydroxide solution - two 2,000 gal
23) acetone and tetrahydrofuran - 2,000 gal
24) caustic solution - 2,000 gal

In addition, there were 80 drums containing vanadium pentoxide, 500 drums of fluoboric acid, 500 drums of waste glue, and 16 drums of concentrated acid. There were also other miscellaneous zinc and hydrocarbon wastes at the facility.

Contaminants found at the site include PCBs, benzene, 1,2-dichloroethane, methylene chloride, styrene, tetrachloroethene, 1,1,1-trichloroethane, trichloroethene, chromium, nickel, zinc, arsenic, iron, mercury, herbicides, pesticides, and dioxins. Site investigations found 137,000 cubic yards of contaminated soils and 1 million gallons of contaminated ground water. Surface waters in the area of the site were also found to be contaminated.

In a 1978 remedial action, approximately 30,000 leaking drums were removed from the site. In-situ vapor extraction was used to remove 137,000 cubic yards of contaminated soils; soils were excavated to a depth of 4 to 6 feet. An additional 18,000 cubic yards of contaminated soil were treated using ex-situ stabilization. A RCRA cap was installed over 5 acres of the stabilized soils. Remedial actions also involved ground-water extraction and air stripping, with a discharge to a POTW.

RI/FS costs associated with the site were approximately $2 million. In the ROD prepared for the site, remedial design costs were estimated at $1.5 million and remedial action costs at $22.2 million ($13 million capital costs and $9.2 million operation and maintenance costs).

SOURCE

1) Notes from RPM Leslie McVicker, EPA Region I, Superfund Branch. July 15, 1992.

2) Transcripts of a Meeting With Silresim Owner: Figures Showing Locations and Contents of Storage Vessels. Transcripts property of U.S. EPA, Region I, Boston, Massachusetts. March 23, 1978.

29) TRI-CITY CONSERVATION CORPORATION, FL

Tri-City Oil Service was a waste oil service company, in operation between the early 1970's and 1983, that collected and distributed oils and other petroleum products. Tri-City sells its oil to four companies (2 mining companies and 2 asphalt companies).

The Tri-City site is located in a mixed commercial-residential area one block south of Bush Boulevard on 50th Street in Hillsborough County, Tampa, Florida. The property is completely fenced in and is not connected to either city water or sewer systems. Six people are employed at the site, which has two electrically-powered small office/house trailers. There is a 1/4 acre (100 foot by 100 foot) impoundment area used for unloading tank trucks at the site. Five tank trucks, ranging in capacity from 1,850 to 2,900 gallons, are located at the site. Seven storage tanks are also located at the site, including:

- a 10,000-gallon capacity underground tank filled with waste oil
- a 6,000-gallon capacity underground tank filled with waste oil
- a non-diked 15,000-gallon capacity above ground tank containing 2,000 gallons of waste oil
- an empty, non-diked 15,000-gallon capacity above ground tank
- two empty, non-diked, up-right 2,000-gallon capacity above ground tanks
- an empty, non-diked, up-right 12,000-gallon capacity above ground tank.

The site geology consists of porous sands underlain by discontinuous clay dens. There may be a direct recharge area to a deeper lying aquifer, such as the Floridian. There are 8 private drinking water wells located within 1/4-mile of the site, two of which are within 50 feet of the site boundary. The site is also located within 2 miles of a well field that serves 15,000 residents of Temple Terrace.

A portion of the Hillsborough River is located 3,000 feet north of the Tri-City site. The river is used as a surface water storage reservoir for the 475,000 people of the City of Tampa.

During an inspection of other sites, the Florida Department of Environmental Regulation (FDER) found that Tri-City was picking up hazardous waste without an EPA ID number or manifest. Every six weeks to two months Tri-City picked up 500 to 2,000 gallons of acetone, MIBK, MEK, xylene, and toluene from a chemical company. Tri-City also picked up small but undetermined quantities of corrosive liquid from another company.

EPA wrote a Record of Decision (September 1987) stating that no further action at the site is necessary and removed the site from the NPL in September 1988.

TRI-CITY CONSERVATION CORPORATION, FL (continued)

The site was broken into in January 1982 and the valves of one of the Tri-City trucks were opened, allowing 3,000 gallons of waste oil to spill onto the open ground. A November 1982 sampling of private ground-water wells adjacent to the site showed the presence of: heavy metals; 2-butanone; 4-methyl, 2 pentanone; methyl ethyl ketone; methyl isobutyl ketone; and toluene at trace levels or higher. Other wells, located farther from the site, showed uniform traces of toluene, but no other contaminants. The uniformity of the toluene levels have led to some suspicions regarding the sampling.

In 1983, a FDER site inspection team noted the presence of 3/4 inches of oil/water mixture covering the ground of the oil storage tank area of the site.

In 1984, FDER found that the top three feet of soil were still contaminated with VOCs (xylene, toluene, ethylbenzene, and tetrachloroethylene), metals (particularly lead), and near an underground tank, low-level PCBs (aroclors 1260 and 1016).

In response to the 1982 waste oil spill, the site was covered over by clean sand fill, without removing the waste spill. In 1984, EPA conducted a removal of contaminated waste oils, sludges, and contaminated soils from the site. Following this action, the FDER commissioned a Contamination Assessment (February 1984) to determine the type and extent of contamination present at the site. Based on its findings that the top three feet of soil were still contaminated with VOCs, metals, and low-level PCBs, FDER conducted a complete removal of: 750 cubic yards of contaminated soils, three above ground storage tanks, and sludges from one underground storage tank.

In August 1985, FDER ground-water sampling found cadmium and chromium concentrations above drinking water standards in two of the four wells sampled. The wells were re-sampled by FDER in January and June 1986. The results of this sampling indicated no contamination.

The estimated total costs of site remediation are summarized below:

- February 1984 contamination assessment: $55,000
- February 1984 removal action: $50,000
- April 1985 removal action: $104,000 (alternative estimate: $50,000)
- May 1985 removal action: $145,000

TRI-CITY CONSERVATION CORPORATION, FL (continued)

SOURCES

1) Health Assessment for Tri-City Conservationist Corporation, Temple Terrace, Florida. April 1989.

2) Memorandum from Chief, USEPA South Site Management Section to Acting Regional Administrator regarding Record of Decision for the Tri-City Conservationist Corporation Site, Temple Terrace, Florida. September 11, 1987.

3) Memorandum to File from Jim Meekin regarding Hillsborough County - HW Tri-City Oil Service Inspection. January 12, 1982.

4) Site Inspection Report for Tri-City Oil Conservationist, Inc., Temple Terrace, Florida. Undated.

5) Memorandum from Regional Administrator to Assistant Administrator Office of Solid Waste and Emergency Response regarding Delegation of Remedy Selection to Region IV for the Tri-City Oil Conservationist Corporation Site, Florida. June 19, 1987.

6) Memorandum from Ron Leins to Vicki Tschinkel regarding Tri-City Oil Source Removal. April 1, 1985.

30) WAYNE WASTE OIL, IN

Wayne Waste Oil, a division of Wayne Reclamation and Recycling, Inc., was operated from 1975 to 1991 as a waste oil recycler and waste treatment facility. The site is located in Columbia City, Whitley County, Indiana and is approximately 30 acres in size. It is bounded to the south and east by the Blue River and Columbia City's Municipal Well Field, which pumps 8 to 10 hours per day.

Originally, in 1931, part of the site was utilized as a slaughter house. From 1953 to 1970 another part of the site operated as a landfill. In 1975 Wayne Reclamation and Recycling, Inc. (WRR) purchased approximately 26 acres and, in 1976, received their license to haul industrial wastes.

The final RI for this site was produced in June 1989. The site is divided into three areas:

1) southeast portion - lower flood plain;
2) northeast portion - former city landfill;
3) central and west portions - uplands.

WRR operated as a waste oil recycler and industrial waste transporter. Since 1975, the industrial wastes handled have included:

1) zinc plating waste;
2) barrels of dried ink;
3) sludges containing copper, nickel, cadmium, chromium, and cyanide;
4) solvents.

The volumes of each of the above materials that was handled is unknown. However, it is known that a total of 1.4 million gallons of the above-mentioned waste including used oil was disposed of by open dumping into unlined pits and trenches, mostly in the southeast area.

In the summer of 1986, an extensive removal action included:

1) excavation and disposal of 5,600 tons of material from the sludge ravine;

2) excavation and disposal of 1,100 tons of material from an oil decanting pit;

3) excavation and disposal of 90 tons of material from a tar pit;

4) removal, testing, and disposal of the contents of 215 55-gallon drums and of 750 tons of soil from a "buried barrel" area, and backfilling the area with off-site soil.

From May 1988 to March 1989 another extensive removal action encompassed the following:

1) removal, testing, and disposal of the contents of 125 additional drums;

2) excavation and disposal of 5,400 tons of contaminated soil from an acid area, "discolored area," an ink sludge area, and a sludge ravine;

3) removal and disposal of the contents (oils and solvents) of 23 horizontal tanks;

4) the backfilling of certain areas with clean soil.

Thus, the total amount of material removed from the site as of June 1989 was 13,000 tons.

Chlorinated ethene, and to a lesser extent, chlorinated ethanes and toluene were predominant organic contaminants occurring in all discrete media forms. The detected metals with elevated concentrations of magnesium, cadmium, copper, zinc, and lead were usually greatest in the top 2 feet of soil. The following contaminants were specifically identified:

WAYNE WASTE OIL, IN (continued)

Soil Contaminant	Concentration (maximum detected level/ geometric mean)
1,2-dichloroethane	71,000 ppb/169 ppb
trichloroethane	43,000 ppb/73 ppb
toluene	59,000 ppb/171 ppb
chlorinated ethene	92,700 ppb
benzene	4 ppb
ethylbenzene	1,200 ppb
total xylenes	4,300 ppb
total cyanide	1,900 ppm/112 ppm

Any contamination of the ground water is localized in the upper aquifer only. Elevated concentrations of chlorinated ethenes (1,900 to 63,824 μg/l), vinyl chloride and 1,2-dichloroethane, aluminum, barium, manganese, and arsenic were detected. However, the concentrations of inorganics in the surface water and sediment of the Blue River were not significantly above background levels.

A ROD has not yet been published, and therefore no specific remedial action has been chosen. Nine possible alternatives and their cost information are outlined in Table One. No cost information was available for the two removal actions.

SOURCE

1) Final RI/FS for Wayne Waste Oil Site. June 1989.

Table One. Remedial Alternatives and Cost Information for Wayne Waste Oil Site

Alternative	Capital Cost ($)	O$M Cost ($)	Total Present Worth Cost ($)
1) No Action	0	0	0
2) Ground-water Extraction and Air Stripping/Capping VOC2 - and PAH-Contaminated Soils/Capping the Municipal Landfill/Removing Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	3,329,630	2,154,070	5,483,700
3) Ground-water Extraction and Air Stripping/Soil Flushing with Treated Water/Capping PAH-Contaminated Soils/Capping the Municipal Landfill/Removing the Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	3,248,230	1,862,618	5,110,848
4) Ground-water Extraction and Air Stripping/Vapor Extraction/Capping PAH-Contaminated Soils/Capping the Municipal Landfill/Removing Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	3,306,875	2,275,624	5,582,499
5) Ground-water Extraction and Air Stripping/Excavation and Biological Treatment of VOC-Contaminated Soils/Capping the Municipal Landfill/Removing the Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	7,988,170	1,938,944	9,927,114
6) Ground-water Extraction and Air Stripping/Excavation and On-Site Thermal Treatment of VOC- and PAH-Contaminated Soils/Capping the Municipal Landfill/Removing the Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	9,805,845	1,516,377	11,322,222

Alternative	Capital Cost ($)	O$M Cost ($)	Total Present Worth Cost ($)
7) Ground-water Extraction and Discharge to the POTW/Capping VOC- and PAH-Contaminated Soils/Capping the Municipal Landfill/Removing the Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	3,571,980	2,813,960	6,385,940
8) Ground-water Extraction and Air Stripping/Excavation and Off-Site Incineration of VOC- and PAH-Contaminated Soils/Capping the Municipal Landfill/Removing the Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	51,339,855	1,516,377	52,856,232
9) Ground-water Extraction and Air Stripping/Excavation of VOC- and PAH-Contaminated Soils/Off-Site RCRA Landfilling/Capping the Municipal Landfill/Removing Contents of Above-Ground and Underground Tanks/Erosion Controls/Deed Restrictions/Monitoring	19,718,600	1,516,377	21,234,977

31) WHITEHOUSE OIL PITS, FL

Allied Petroleum constructed the seven pits on the Whitehouse Oil Pits site to dispose of waste oil and acid clay sludges from its oil re-refining process. The site, which is 7 acres in size, operated from 1958 to 1968 at Grayson Street in Duval County, Whitehouse, Florida 32220. The first pit was constructed in 1958 and the seventh was built and filled by 1968. The site is located on the McGirts Creek drainage basin and is 1/2 mile upland of a 220-acre cypress swamp. A small stream which originates in the swamp runs by the site and empties into McGirts Creek. Allied utilized an acid-clay waste oil recovery process which formed as by-products waste acid tar and spent acid clays. These were the wastes disposed of in the 5 to 15 foot deep pits. Currently, it is estimated that the seven unlined pits contain 127,000 cubic yards of waste; since stabilization activities during the 1980's the volume of contaminated material has increased to 240,000 cubic yards.

In 1969, Allied Petroleum declared bankruptcy and abandoned the site, which then became the property of the City of Jacksonville. The pits remained and served as an "open dump" for several years. Dumping in the pits was indiscriminate and little specific information is available, except that they were used by a local General Electric Company transformer repair shop to dispose of "waste."

Currently, an RI/FS and one ROD have been completed for the Whitehouse Oil Pits site. In 1968, following abandonment by Allied, the dike surrounding Pit #7 ruptured and the contents (no volume available) spilled into the adjacent property and McGirts Creek. Minor cleanup work was performed to the extent that the pit was backfilled with soil. On June 29, 1976, 200,000 gallons of oil spilled while attempting to repair a dike wall. EPA performed the cleanup and, recognizing the hazard of the remaining five pits, established a treatment plan. The pits were drained, then backfilled with various forms of debris (lumber, wood chips, etc.), layers of automobile shredder waste, Fuller's earth (mixed with the liquid portion of the sludge), and clean earth. In 1979, water and soil samples indicated the pits were continuing to release contaminants. They were reinforced with a layer of local clay and topsoil, and seeded with grass.

While the surface water quality of McGirts Creek has noticeably improved since 1977, the soil and ground water still contain elevated concentrations of metals and some organics. The soils in the pits are heavily contaminated with certain metals such as copper, iron, calcium, cadmium, magnesium, nickel and especially chromium (40 mg/kg), lead (6,900 mg/kg) and zinc (2,000 mg/kg). For example, at a depth of 10 feet in the pits, the lead concentration is 138,000 times the maximum contamination level for drinking or Class II surface water. There is also a high degree of leachate contamination in the adjacent swamp. The level of contamination at 20 to 25 feet is almost as high as in the surficial sands. There are several areas of oily sludge on the surface of the flood plain, and water samples indicate hydrocarbon (oil) concentrations greater than 1,000

micrograms per liter. The ground water also contains elevated levels of the following contaminants:

arsenic	10 ppb
chromium	68,000 ppb
lead	376 ppb
benzene	9 ppb
phenols	330 ppb

The surface water contaminants are probably not directly from the pits since they were stabilized, but rather from the tributary connected to the contaminated swamp.

The Record of Decision recommended an alternative which addresses the containment of wastes, and specifically includes:

1) construction of a slurry wall around entire site, keyed into the aquitard, isolating the waste,

2) recovery and treatment of contaminated ground water within the walled area,

3) removal of contaminated sediments from the northeast tributary of McGirts Creek and placing them within the isolation area,

4) surface cap entire site to reduce the inflow of water into the walled area.

From June 1976 through May 1977, EPA and the City of Jacksonville spent $250,000 on the first phase of cleanup, and in the summer of 1980, Jacksonville spent $67,000 on the second phase. The estimated costs for the RI/FS are $173,000. The capital cost for the remedial action is estimated to be $2,302,000, and the Operating and Maintenance cost is $96,600 for the first 25 years and $40,800 for the second 25 years.

SOURCES

1) Remedial Investigation/Feasibility Study for Whitehouse Oil Pits, FL. January 1985. Pages 105-144.

2) Record of Decision for Whitehouse Oil Pits, FL. May 1985. Pages 1-10.

3) Summary of Remedial Alternative Selection, Whitehouse Oil Pits, FL. May 1985.

WHITEHOUSE OIL PITS, FL (continued)

4) Summary of Site Inspection Documents, Whitehouse Oil Pits, FL. August 17, 1976.

32) YORK OIL COMPANY SITE, NY

The York Oil Company site began operations as a used oil recycler and eventually became a tank and lagoon storage facility for PCB-laden waste oil. This facility has always handled used oil. No other industrial activities were found to have occurred at this site. Beginning in 1954, used oil was brought on site to be recycled. In 1962, this activity ceased and activities at the facility turned to on-site storage and disposal until 1977.

The 17-acre site is located in the Hamlet of Moira, in Franklin County, New York. The site is bounded on the north and east by private homes, and on the west and south by wetlands and woodlands. It is a rural area where nearby residents rely on private drinking wells as their sole drinking water supply. The site is located within the Lawrence Brook watershed, and is situated on the side of a glaciated hill. A significant geohydrologic factor throughout the site is the presence of a glacial till layer ranging in thickness from 5 to 20 feet. This confining till is a barrier to ground-water flow and is very important since it protects residential wells that are screened in the bedrock from contamination emanating from the site.

In February 1988, the Regional Administrator signed a Record of Decision concerning the site. In January 1990, a statement of work for remedial design and remedial action was issued. Beginning in 1954, York Oil Company used the site to wash used oils. The oil was processed to remove impurities and dirt. The washed oil was then re-sold to a number of businesses. This operation was discontinued in 1962. From 1962 to 1977, Pierce Brothers Oil Service, Inc. used the site to store oil. Some oil accepted by the facility was contaminated with PCBs, chromium, lead, zinc, phenols, and other contaminants. Oil was stored in eight metal storage tanks, at least one underground storage tank, and in three unlined lagoons. Impurities settled in the lagoons and light oils were decanted and sold as fuel oil. Oil levels in the lagoon varied from 2 to 7 feet and sludge depths were reportedly as much as 5.5. feet. At the time of the ROD, the three lagoons were covered, the one underground storage tank was empty (capacity 5,000 to 10,000 gallons), and only two 25,000-gallon above-ground storage tanks remained on-site. These two tanks contained a total of approximately 25,000 gallons of contaminated oil and sludge. Also, approximately ninety 55-gallon drums containing site cleanup equipment are stored on site.

During heavy rains and spring thaw, the oil-water emulsion from the lagoons often would overflow into the surrounding lands. Between April 1979 and December 1981, USEPA and New York State took several emergency remedial actions on site, including draining the lagoons and placing the PCB-contaminated used oil in the above-ground storage tanks. The contaminated soils from the adjacent western strip of land were temporarily consolidated in lagoons one and two with kiln dust and sand, and lagoon three was graded with soil and sand. Oil seepage control operations were initiated, and

a 6-foot chain link fence erected around the site during remediation. Approximately 30,000 cubic yards of contaminated soils were to be treated. As mentioned above, approximately 25,000 gallons of contaminated tank oils and other oils also existed on-site. Primary contaminants are PCBs (maximum concentration of 230 ppm), heavy metals, including copper, lead (maximum concentration of 16,000 ppm), and zinc, volatile organics and total phenolics.

Remediation activities called for the excavation of the 30,000 cubic yards of contaminated soils followed by on-site solidification of this material. Other remediation elements include installation of thirteen deep ground-water drawdown wells, on-site treatment of contaminated ground water, off-site thermal treatment of 25,000 gallons of contaminated tank oils, and further study of possible additional remedial actions. The total cost estimate for this remediation project is $7 million.

SOURCES

1) Record of Decision, York Oil Company Site. February 9, 1988.

2) Remedial Investigation Report, York Oil Company Site, prepared for New York State Department of Environmental Conservation. August 1985.

PART III

The following 24 Superfund site summaries are less detailed than the previous summaries found in this report, since only two sources were used to investigate them. The two sources used were HRS Packages and Records of Decision (where available) for each site.

1) ARRCOM CORP. (DREXLER ENTERPRISES), ID

Arrcom operated as a used oil recycler. The site was abandoned in 1982. A 45,000 gallon storage tank at the site was leaking onto the ground when it was inspected by EPA. Other containers were sealed and in sound condition with concrete pads underneath. Soil and groundwater have been contaminated. Contaminants found at the site include chloroform, toluene, methyl ethyl ketone, paint thinners, acetone, solvents, xylene, lead and PCBs.

Action was taken at the site by EPA under RCRA and several emergency removals have been performed. EPA is currently moving forward with a proposed cleanup plan.

2) BRUIN LAGOON, PA

The Bruin Oil Company, which began operations in the 1930s, disposed of wastes from the production of mineral oil in an earthen diked lagoon on property adjacent to the refinery. The American International Petroleum Company later used the site for disposal of wastes from motor oil re-refining, coal fines and fly ash. In 1968, a spill of 3,000 gallons of acidic sludge caused a large fish kill and the temporary shutdown of downstream water supply systems. A flood in 1980 caused the lagoon to overflow, contaminating the surrounding area. Soil and sludge at the facility are contaminated with heavy metals, sulfur, sulfonic acid, sulfuric acid, acid esters, sodium sulfate, and alkyl benzene sulfonate. Gas recovery wells had to be installed to contain potentially hazardous gases including sulfur dioxide, hydrogen sulfide, carbon dioxide, and methane.

EPA signed a Superfund State Contract with Pennsylvania for implementation of remedial action in 1982. The work was managed by the U.S. Army Corps of Engineers. During cleanup operations, a previously unidentified sludge layer was penetrated, releasing toxic gases containing high concentrations of carbon dioxide, sulfuric acid mist, and hydrogen sulfide. EPA took emergency action, which included backfilling the lagoon and installation of gas recovery wells.

In 1986, EPA determined that a further remedial investigation was necessary before continuing cleanup action at the site. At the present time, the State of Pennsylvania plans to take over operation and maintenance of Bruin Lagoon.