

# Dioxin in Missouri: Troubled Times

A small midwestern town's hazardous waste problem is under a national magnifying glass



Beyond the roadblock (above) is dioxin-tainted Times Beach.

Flood wreckage (opposite page) was a common sight there during the past month.

EPA workers scooped silt off of such trash (below left) to determine whether floodwaters moved the dioxin.

An EPA crew also collected soil samples (below right) before the flood.

By LINDA GARMON

TIMES BEACH, MO. — This town had been Yolanda Bohrer's home for 17 years until it was swallowed and spit back out by a twisting branch of the muddy Mississippi River. Now, weeks after the floodwaters receded, Times Beach, Mo., still does not resemble the place she and about 2,200 other residents were forced to evacuate on Dec. 5. "You see there where only one wall is standing," she says; "that used to be a church.... And parts of this building," she says, pointing to some semblance of an enclosed structure, "were carried a block and a half down toward the tavern." On Laurel Street, an entire house sits in front of its own foundation, and the mobile homes on the next block, Bohrer notes, look like fallen dominoes.

A ghost town-like pall hovers over the area, for only about 200 residents have chosen to return to pick through the waterlogged piles of post-flood debris. Bohrer and the rest have decided to move into nearby hotels or homes of relatives. They are afraid to return, because analyses of Times Beach soil samples — collected, coincidentally, the week before the flood — indicate the town is tainted with possibly dangerous levels of one of the most hazardous man-made substances — 2,3,7,8-TCDD, a member of the chemical class dioxin. Bohrer remembers what brought about the contamination: spraying of waste oil 10 years ago to control the

dust on the town's unpaved roads.

Once there was a small flood plain 25 miles southwest of St. Louis that was dubbed "Times Beach," because it was a "shore," on the Meramec River, owned by the St. Louis Star Times newspaper. In the early 1900s, that newspaper began giving away chunks of the land with the purchase of one-year subscriptions. A blue-collar town emerged, but it never grew larger than one square mile; it never grew large enough to be included on the biggest of Missouri maps.

But last December, two almost simultaneous events placed Times Beach smack in the national spotlight: the discovery by both a private analytical firm and the Environmental Protection Agency that various sections of the town were contaminated with the potentially cancer-causing chemical TCDD, and the flooding of the tainted town. Authorities feared that engulfing waters might have unearthed the dioxin-contaminated soil, spreading it all over town, depositing it on the wreckage created by the flood. So EPA sampling crews were called back in, and officials from the Centers for Disease Control recommended that residents evacuate the area.

Meanwhile, there was a growing public awareness that the Times Beach dioxin problem may only be the tip of a hazardous waste iceberg in Missouri. Times Beach is but one of 15 EPA-confirmed, di-



Wide World



Wide World



L. Garmon

oxin-tainted sites in the state. In addition, there are about 80 other suspected sites in the state now under EPA investigation. All this "could classify Missouri's as the most toxic waste problem we now have" in the nation, says Mike Wessel, assistant to U.S. Rep. Richard A. Gephardt (D-Mo.). Gephardt sat on a committee that conducted a Nov. 19 hearing in Washington, D.C., to assess a then already apparent Missouri dioxin problem. At the hearing, Ellen K. Silbergeld of the Environmental Defense Fund, a Washington-based public interest group, testified that EPA's handling of the Missouri situation was showing a lack of commitment to the ideals of Superfund, a pool of EPA-controlled money established by Congress in 1980 for use in expediting clean-up of hazardous waste sites. Wessel says that now, Congress is scrutinizing EPA's every move at TCDD-contaminated Times Beach.

TCDD, or 2,3,7,8-tetrachlorodibenzo-*p*-dioxin, is formed as an undesirable contaminant in the production of the bactericide 2,4,5-trichlorophenol and products made from it, such as 2,4,5-T, a component of the herbicide Agent Orange. The dioxin is known to cause a skin disorder called chloracne and has been shown to cause cancer in animals. Exposure to TCDD also has been linked in animal studies to weight loss, liver disorders, gastric ulcers and birth defects. The CDC recommended maximum soil dioxin level is 1 part per billion. CDC officials have calculated that if 1 million persons were exposed to that level throughout a community's lifetime, then that community would experience one excess cancer case.

Between 1969 and 1971, unknown amounts of the cancer-causing TCDD were produced when Northeastern Pharmaceutical & Chemical Co. (NEPACCO) manufactured hexachlorophene (an antiseptic) at a chemical facility leased from the Hoffman-Taff Chemical Co. in Verona, Mo. This was the very first link in the chain of events that led up to the Times Beach incident and, in fact, the majority of confirmed and suspected dioxin contamina-

tions in Missouri. The second link came into play when the market for hexachlorophene collapsed in 1971 and NEPACCO went out of business. The company hired one of its chemical suppliers, Independent Petrochemical Corp. of St. Louis, to dispose of its wastes; this latter chemical company in turn hired a man whose name has become a household word in Missouri: Russell Bliss.

In 1971, Bliss sprayed about 2,000 gallons of that dioxin-contaminated waste plus oil on a horse arena near Moscow Mills. Bliss, who ultimately would be responsible for spraying Times Beach's unpaved roads and other Missouri areas with similar oil, has said repeatedly that he was not informed of this contamination (which, in the case of the substance sprayed on the horse arena, may have been as high as 356 parts per million, or 356,000 ppb of TCDD). Officials from the two chemical companies have disputed Bliss's claims. In any event, shortly thereafter, numerous birds, rodents and horses in the arena vicinity died. Among the signs of toxicity in the horses were chronic weight loss, loss of hair, skin lesions and intestinal colic. Human illnesses, which included a case of bladder hemorrhaging, also were associated with exposure to the arena.

In 1974, after many months of probing this mysterious episode, Renate D. Kimbrough and colleagues at CDC reached the conclusion that it was TCDD in the horse arena soil, in concentrations of 31.8 to 33 ppm, that apparently had caused the animal and human poisonings. Kimbrough and cohorts eventually published their findings in the May 16, 1975 *SCIENCE*.

In addition, in a related investigation in 1974, the CDC team learned that two residences near Imperial, Mo., sat atop dioxin-contaminated soil that had been taken for landfill from another Bliss-sprayed horse arena. In a March 31, 1975, memo to Missouri officials, CDC recommended removal and deep burial of the yardfill.

Today, the Imperial site is on the list of 15

confirmed TCDD-contaminated areas in Missouri; officials never followed up on the CDC recommendation. In fact, in a July 24, 1975, memo regarding the Imperial site, State Department of Natural Resources officials conclude that "the CDC recommendation is overly cautious." The memo notes that Pat Phillips, a veterinarian with the State Division of Health, had concurred with the decision.

This memo was included in the reams of documents a group of Times Beach "refugees" and members of the St. Louis Coalition for the Environment were allowed to sift through on Jan. 11, 1983, after their Freedom of Information Act request had been granted. Both the former residents and the public interest group members are attempting to show that a series of state and federal agency decisions — similar to that reflected in the 1975 DNR memo — may have contributed to dioxin contamination in Missouri.

But spokesmen from the DNR and the State Division of Health still defend those decisions on several grounds. First, they say that in the past, it was believed that the TCDD half-life in soils was only about half a year. Now scientists know the half-life is much longer — possibly decades. Moreover, Denny Donnell of the State Division of Health says that his agency, DNR and the regional office of the EPA were busy dealing with other environmental problems considered more pressing than the dioxin-contaminated soil. Finally, he says, "We're dealing with a tragedy of past events when laws were not clearly defined and powers of agencies were not strong enough to prevent this sort of thing from happening."

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"I remember . . . riding our bikes through it and getting it on the back of our clothes and getting all dirty by it and tracking it into the house and getting into trouble," says Bohrer, recalling the dioxin-contaminated-waste-oil spraying of Times Beach roads. And when residents tried to remove the oil that had splashed onto their cars, Bohrer says, they removed the car paint as well.

As she surveys the Times Beach roads that once served as her playground, Bohrer pulls out a map of this small town — one EPA prepared after analyzing preliminary soil samples that had been collected at the roadsides before the December flood. According to the map, there is no detectable TCDD on the block where she lived. But that area is sandwiched by two blocks that have from 20 to 100 ppb of the dioxin. Other nearby blocks are labeled "more than 100 ppb."

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The past events of the Missouri dioxin tragedy began to publicly unfold, more than ever before, last fall. An EPA list of about 30 suspected contaminated sites, which included Times Beach, was made public. The agency took preliminary soil samples from the Meramec River city on

Nov. 30 to test for dioxin and informed residents that meaningful results could not be obtained for many weeks. Anxious for a quicker verdict, Laine Jumper and other Times Beach residents pooled together about \$1,000 and hired a private analytical firm, Envirodyne Engineers, Inc. of St. Louis, to collect and analyze soil. Though not extensive, the Envirodyne test did confirm the presence of dioxin. And release of Envirodyne's data soon was followed by an EPA confirmation of dioxin contamination in the agency's own preliminary soil collection.

Despite these independent confirmations of dioxin contamination, notes Silbergeld, EPA officials have yet to propose a plan for "decontaminating" Times Beach—such as by capping or removing its soil. Rowena Michaels of the EPA regional office in Kansas City explains that before the agency can choose an appropriate decontamination scheme, it must more precisely define the extent of the problem. But environmentalists and former Times Beach residents maintain that the agency is merely dragging its feet at the expense of community well-being.

"I know it sounds ridiculous," Silbergeld says, "but all I can say is that the people of Times Beach are damned lucky they had a flood." Then, the Federal Emergency Management Agency was called in to coordinate flood- and dioxin-related operations at Times Beach. Says Jumper, who had lived on the Meramec flood plain for 11 years before the river swelled, "FEMA has been the only government agency that's gone out on a limb to help us." For example, Times Beach residents had mismanaged their flood plain, building too many potentially floodwater-diverting structures in the plain. As a result, they disqualified themselves for the federal flood insurance "rebuilding aids." Nonetheless, FEMA still is providing "humanitarian aid," which includes temporary housing and individual family grants up to \$5,000. By contrast, says Jumper, EPA is "paying more attention to the flood debris than to the people of Times Beach."

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An EPA crew clothed in silvery-white jumpsuits, respirators and protective boots, returns from its special Sunday morning mission of collecting spoon-scraped samples of silt that had been deposited by floodwaters onto debris in and outside of Times Beach homes. The wreckage, creating a sanitation problem, was scheduled to be trucked to a landfill in Warren County, Mo.; but residents there, fearing the trash is dioxin-contaminated, secured a circuit court-ordered temporary halt of its transfer.

Analysis of the silt samples being unloaded by the EPA crew may be necessary to determine whether the trash trucks will roll. Nonetheless, at least one crew member, John Heemer, finds this project rather disturbing when it requires sampling inside of the homes of families who have

chosen not to evacuate. "It's real crazy," he says; "we walk into these people's homes with our suits on, and their kids are just running around." Heemer says the EPA crew must look like the space agency officials who invaded a California suburban home in the movie *E.T.*

Several yards from the roped-off area where Heemer and co-workers unload samples and decontaminate themselves is a mobile home where state psychologists provide counseling for troubled Times Beach residents. The trailer also serves as a meeting place for those who do not wish to venture far beyond the Times Beach roadblock, which warns "Do Not Enter," and pictures a skull and crossbones. Inside the trailer, Gary Stein of CDC listens to a Times Beach resident who is weighing the risks and benefits of evacuating his home. "I've been here all these years, and nothin's happened yet," the resident points out. But Stein counters that just as he would tell a long-time smoker to quit even if there were no apparent health effects from it yet, he must recommend that the resident leave his home—now.

Lately, Stein says, he has such discussions about 20 times a day.

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Times Beach, says Silbergeld, is a "total déjà vu" of the community anxiety and EPA delay and ad hoc responses that characterized the history of the Love Canal incident, which resulted from Hooker Chemical Co. dumping 21,800 tons of chemicals, including dioxin, into a canal that surrounded a 10-block neighborhood. And the establishment of a Superfund was supposed to eliminate the Love Canals, she says. EPA has used "superfunds" to test soil samples and, more recently, to provide CDC with one-half million dollars to conduct a health survey of residents of Times Beach and of several other dioxin-contaminated areas (see p. 54). "But what's really at issue here," Silbergeld says, is whether EPA is going to use *clean-up* funds under the Superfund law for Times Beach.

Those funds, financed by a combination of industry fees and federal appropriations, were established to enable EPA to quickly respond to a hazardous waste situation—even when no responsible or financially capable party can be found to bear the cost. In order to qualify for the "remedial action" portion of these funds, a site must be deemed one of the top 400 priority hazardous waste sites in the nation. Three dioxin-contaminated Missouri sites, the Imperial area, a Bliss-sprayed horse arena and the Syntex facility in Verona, already are on the list. But Missouri Gov. Christopher S. (Kit) Bond has asked that EPA list the state's entire dioxin problem, including Times Beach, as one generic priority site.

EPA now is considering that request, using its own system, which includes factors such as population density, for evaluating the extent of a waste problem. But

Congress has raised questions about the agency's site selection procedure. Moreover, says Wessel, because Superfund is only two years old, EPA has not yet taken much action under it. So, once Missouri sites are chosen, "If EPA decides to buy out the people and relocate them at one site, does this mean they have to relocate all people in other [dioxin-contaminated] areas?" Says Wessel, "We're dealing with a number of precedents." As a result, the dioxin situation in Missouri is under a national "magnifying glass."

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Twenty minutes up the interstate from Times Beach is a once-abandoned 22,500-square-foot shopping center unit that now is the makeshift disaster field office headquarters for the flood- and dioxin-related operations in the troubled town. Inside the office, a FEMA employee starts straightening her desk and packing up some belongings. "I'm going home to see what my family looks like," she says to her co-workers; "hey, this is unusual...it's not 7 or 8 or 9—it's only 5 [p.m.]."

A portable television several desks away is switched on for the local news broadcast, and a dozen persons who have been making that news during the past several weeks crowd around the set. The lead story includes film of the trucks loaded with Times Beach flood debris finally rolling down the highway, en route to Bob's Home Service hazardous waste landfill in Warren County. The day before, EPA had announced that no levels of dioxin greater than 1 ppb had been found on the samples of silt that earlier in the week had been scraped off of flood debris. (Flood waters could have deposited silt from upstream on the trash, rather than have unearthed Times Beach soil.) These results refer only to flood-deposited silt; only the silt-covered debris is being removed. The fate of the Times Beach soil, its roads and yards, will depend on the analysis over the next few weeks of soil plugs, drilled as deep as two feet, that still are being collected. It also will depend on whether EPA deems Missouri to be a priority problem.

TV clips of the trash truck caravan are followed by a story on Bliss, who had testified earlier in the day at a Missouri House energy committee hearing on the state's dioxin situation. "I swear to all of you," Bliss is shown testifying, choking back tears, "I had no idea this [dioxin-contaminated waste-oil he sprayed throughout the state] was bad—as God is my witness." The committee plans to hear the NEPACCO and Independent Petrochemical Corp. responses to Bliss's testimony in the weeks to follow.

Bliss pauses for a few seconds and then adds: "I just wish this oil had been disposed of some other way."

From the half-circle of viewers for whom the day at FEMA headquarters is not yet over comes one immediate comment, in a wearied, almost resigned tone: "And so do I." □