The Sludge Factor

Congress enacts a ban on ocean dumping of sewage sludge, but this popular law will not make New Jersey's beaches any cleaner

CONGRESS HAS VOTED TO END the dumping of sewage sludge in the ocean by 1 January 1992. In doing so, it joins an environmental and political bandwagon that has been rolling in this direction since the late 1970s. The wagon got another shove last month when Vice President George Bush, on a campaign swing that took him to New Jersey's beaches, promised to end ocean dumping if elected. Congress responded quickly to this popular idea, passing a law already in debate.

There is irony in this decision: it will do nothing to clean New Jersey's polluted beaches, the problem that got the bandwagon rolling. Nor will it remove metals and polychlorinated biphenyls from sludge, which still must be dumped somewhere. However, it may force the affected cities to improve their sewage systems.

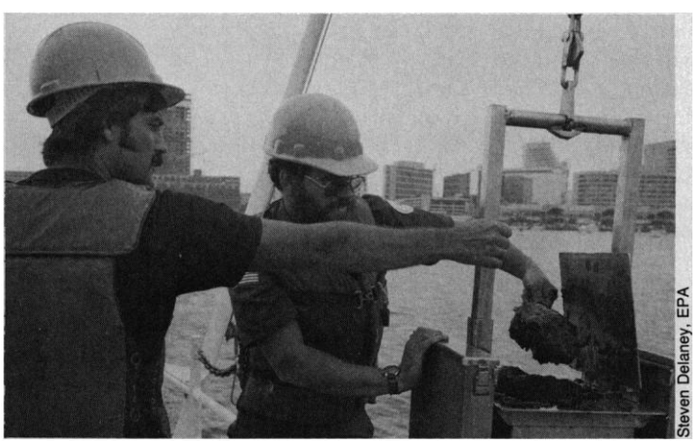
The new ocean dumping law went to the White House for the President's signature on 19 October. It asks the Environmental Protection Agency (EPA) to use escalating permit fees and penalties to phase out the sludge operations of the nine remaining ocean dumpers: New York City and eight nearby municipalities. If the ocean dumpers cooperate with the program, they will be allowed to get back most of the penalties they pay, for their own use on "alternative" disposal schemes. New York City may have trouble finding alternatives, however, because metals appear at high concentrations in its sludge.

Sludge is a by-product of secondary sewage treatment plants. In general, the more one treats sewage, the higher the concentration of contaminants. The East Coast ocean dumpers account for 4% of the nation's sludge. A few other jurisdictions, notably Boston and San Diego, pipe sewage that has only gone through primary treatment into the ocean, but are under court order to end the practice.

The impetus to end ocean dumping came from Atlantic coast businesses that lost money last summer when bacteria and debris turned up on their beaches, scaring off tourists. In the public mind, the mess was apparently linked with the 60-year-old practice of dumping treated sewage in the New York Bight.

Officials in EPA's New York (Region II) office do not rule out a link between sludge and beach pollution, but they are virtually certain there is none. "We have never been able to establish a connection," says Mario Del Vicario. Richard Caspe, EPA's regional chief of water management, says, "There's no basis for linking the two."

Almost certainly, Del Vicario says, the junk on the beach comes from (i) sewers that mix storm runoff with municipal waste and overflow during periods of heavy rain ("combined sewers"), (ii) a broken treatment plant in New Jersey last summer, and (iii) floatable material that collects in streets, drains, and salt marshes and is flushed out by big storms or high tides. What makes the situation look so bad, Del Vicario thinks, is that "we're seeing more nonbiodegradable materials," including such things as addicts' plastic syringes, tossed into the gutter and washed out to sea. "With the right weather conditions, we can almost predict" the moment of public protest.



Steven Delaney, EPA

Eight million tons *of sludge, the residue from sewage facilities in New York and New Jersey, go into the Atlantic ocean each year.*

The combined sewer overflow problem can be tamed, Caspe says, if the city of New York spends "billions upon billions of dollars" to close the leaky points. Mayor Edward Koch has offered to spend $1.2 billion for this work over the next 10 years. The gesture is "not to be sniffed at," Caspe says, but it is not enough to solve the problem, either.

Taking a broader view, John Pearce, deputy director of the Northeast Fisheries Center in Woods Hole, Massachusetts, part of the National Oceanic and Atmospheric Administration (NOAA), says the deeper problem is uncontrolled residential and commercial development along the coast. He praises New Jersey Governor Thomas Kean for seeing the problem in its larger dimensions. Kean ordered a moratorium this month on coastal development until the state has a better plan for managing it.

Thus, the sludge ban will not do much for the beaches, but it may do a lot for sea creatures living 50 to 100 miles offshore. Environmentalists and some fishing interests argued that the ban was needed to protect marine life, citing biological data from an old sludge dump site that was closed last year and anecdotal evidence collected this year from a new dump site. In 1987, EPA closed the old "12-mile site" (12 miles out of New York Harbor), used since 1924 for sewage and industrial wastes. Industrial dumping was stopped several years ago. But after losing a legal fight with New York in 1981, EPA agreed to let the city continue dumping treated sewage at a more distant new site on the edge of the continental shelf, 106 miles out. Six New Jersey communities and two from New York took advantage of the ruling and began using the 106-mile site as well. Over 8 million wet tons of sludge are dumped annually.

There is little doubt that shellfish at the old site were affected. But EPA thought there would be no impact at the new site, for several reasons. Industrial dumping is not allowed. The site is in deep water (2000 meters rather than 40 meters) so that there is little bottom-dwelling life to be injured. The currents are swift enough, EPA figured, to disperse the sludge quickly and dilute toxic ingredients to a safe concentration.

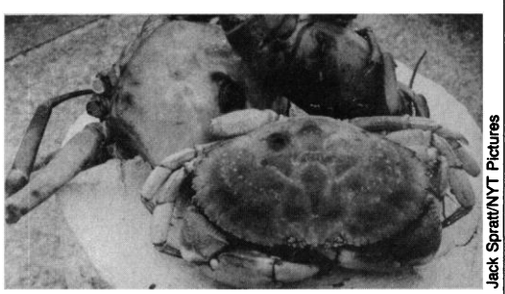
Dumping at the 106-mile site peaked last January when the old site was closed. In the spring, some fishermen claimed that they had picked up sick lobsters and fish near the new site. Photographs of them appeared in the news. There were also some complaints about foul water. But Pearce, who counts himself an ally of the fishermen, says he has yet to see any scientific evidence of abnormal rates of disease. During four recent NOAA cruises through the area, Pearce says, "The samples did not reveal any increased incidence of disease in shellfish or fin fish."

However, according to Caspe, EPA

found that the sludge was not dispersing as quickly as expected. The agency will reduce the permitted dumping rate "significantly" in coming months, perhaps to much less than one-half the present rate, meaning that sludge barges will have to remain at sea more than twice as long. Having spent about $40 million to acquire the deep water barges in time for EPA's December 1987 deadline for closing the old dump site, New York City may find itself one year later the owner of an obsolete fleet. The fiasco is partly of the city's own making. Had it moved toward land disposal in 1981, as EPA wanted, rather than suing for an exemption, it might have more options now.

One of the problems with New York's sludge is that it contains relatively high concentrations of cadmium, copper, lead, mercury, nickel, silver, and PCBs. Mayor Koch estimated this year that it would cost about $500 million to build three new incinerators to burn the sludge. It might be impossible to find sites for them, but, Koch says, even if it were possible, it would not be desirable. New York's air is bad enough already. The toxic ingredients, the scarcity of open land, and the enormous volume of waste also make it difficult to dispose of sludge on land. The city is in a bind.

The toxic ingredients point to another irony. As chairman of the Vice President's Task Force on Regulatory Relief, George Bush in 1981 objected to elements of a plan EPA put forward to require "pretreatment" of waste by industries that use the public sewers. EPA's goal was to have the polluters



Jack Spratt/NYT Pictures

Shell injuries *found on crabs and lobsters last summer were popularly linked to sludge.*

remove toxic elements at the source and make sludge easier to dispose of. "Clean" sludge can be burned or used as a soil builder. For example, Milwaukee packages and sells treated sludge as a lawn fertilizer called Milorganite. Seattle sells most of its sludge to timber companies for use on tree farms. Some researchers think it could be used to promote marine life in barren ocean sites.

In 1981, the Vice President's task force objected to the pretreatment program on technical grounds, causing EPA to suspend action for 8 months. At the same time, the Administration cut back funding for EPA's water office, signaling that the new standards would not be strictly enforced, according to a recent report by Clean Water Action, a proenvironment lobby in Washington, D.C. Later, an environmental group sued on a related subject and won a federal court order putting the pretreatment rules into effect.

In addition to controlling pollution at the source in this way, EPA hopes to control it at the destination with technical definitions of safe sludge. The agency plans to establish detailed limits on 22 toxic compounds next spring. The Natural Resources Defense Council (NRDC) argues that EPA cannot be trusted to do this job properly because it has already engaged in an "illegal and unconscionable" delay in issuing the regulations, according to NRDC attorney Jessica Landman. NRDC is suing to obtain a court-imposed schedule for action.

Congress originally ordered action on sludge in the Clean Water Act amendments of 1977, giving EPA a deadline of 1978 for writing new rules. Almost a decade later, Congress again ordered action in the Clean Water Act amendments of 1986, setting an absolute deadline of June 1988. The law was pocket-vetoed by President Reagan at the year's end, passed again by Congress the next year, vetoed again by Reagan, and enacted by override in 1987. The law's deadline of June 1988 passed unmet; NRDC argues the courts must now intervene.

It is not clear, however, that writing tough new rules will make the sludge clean. Caspe of EPA's New York office says that the agency has already had an enforcement blitz on the big targets in New York—30 major electroplating companies that were dumping materials into the public system. "We significantly frightened the industry," he says, so that others voluntarily came into compliance with pretreatment rules. But now the job gets more difficult. Copper is a problem for sludge disposal on land, and New York's sludge is loaded with copper. Caspe thinks most of it comes from water pipes in millions of private residences. One hope for controlling it is to change the chemistry of the water, an idea that may not be popular.

In pollution control, the hard work comes in the regulatory details, hammered out over many years. It will be interesting to see whether those who championed the sludge dumping ban this fall will follow through with support for the difficult regulatory program it will require in the future.

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Legal Trouble for DOE's Reactors

America's strategic weapons production system, crippled already by safety problems, may be hung up by a new environmental lawsuit.

On 19 October, the Natural Resources Defense Council (NRDC) announced that it may sue this fall to stop the Department of Energy (DOE) from turning on three reactors at the Savannah River Plant in South Carolina: the K, L, and P Reactors. These are the last operating units in the weapons production system. They have been down since safety hazards were discovered in August (*Science* 21 October, p. 363).

Secretary of Energy John Herrington said earlier this month that he intends to restart one reactor when renovations are completed in December and have all three running by this time next year. There is no urgent need for plutonium, one of the strategic materials produced at Savannah River, Herrington said. But DOE wants to resume tritium production soon because this isotope decays at the rate of about 5.5% a year. Defense officials estimate that the present tritium reserve can support normal operations for about 9 months, while the NRDC maintains it can be stretched to last 18 months.

The NRDC argues that the reactors have been shut down for "substantial renovations" over a period of several months and that "serious environmental and safety risks" are still unresolved. Resuming operation before all issues are dealt with would amount to "a major federal action significantly affecting the quality of the human environment," according to Dan Reicher, an NRDC attorney. Under the National Environmental Policy Act, the government cannot take a "major action" of this kind without first describing it and seeking public comment on an environmental impact statement—a process that could take a year.

In a letter to the Energy Department, NRDC attorneys asked the government to agree by 11 November to go through this process. If it does not agree, the NRDC will go to court.

The NRDC filed a similar suit in 1983 when the government proposed to restart the L Reactor after a long period of disuse, and won.

A DOE spokesman says, "We do not feel an environmental impact statement is necessary because this is not a major federal action." But the department has not yet responded to the NRDC letter.

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