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Water pollution control

Cleanup goal oceans and fortunes away

EPA sails in troubled waters, doesn't expect industry will meet pollution deadline because of tangled triumvirate of economic, energy and environmental ills

"We are not going to attain the 1977 or 1983 water cleanup goals, there's never been a question about it, and big dramatic results still remain a promise of the future."

So admitted Russell E. Train, head of the Environmental Protection Agency, before whirring tv cameras and reporters at the annual conference of the Water Pollution Control Federation in Miami Beach.

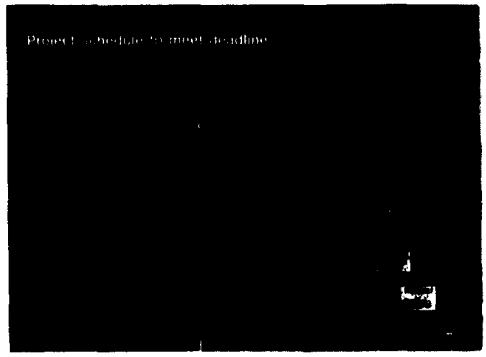
"But," he stressed, "these are important goals, and we're making progress on the industrial front because we've reached a point where the program under the Water Pollution Control Act of 1972 is essentially in place."

With these statements, Train tried to pinpoint the nation's still fog-shrouded position on its rough and stormy voyage toward the goals of clean waterways and water sources by 1983. However, many people in industry, environmental movements, as well as in government charge he and his agency are way off course. While they clearly agree that the mid-eighties deadline is unattainable, they disagree with Train's rather optimistic assessment of and outlook on the cleanup program's implementation, its enforcement and administration.

A draft report of the National Commission on Water Quality, for example, concludes that the Water Pollution Control Act and its administration by the EPA have been deficient in moving the nation towards its cleanup goal in the mid-nineteen-eighties. The commission, headed by Vice President Nelson Rockefeller, made these points in its 18-month, $17 million study:

- The cleanup program is lagging so badly that phased 1977 and 1983 deadlines for improving municipal and





By Frank E. Haerhoff, senior editor

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industrial fluid waste discharges probably cannot be met.

- The delay has been due in part to slowness in disbursing the $18 billion in Federal assistance grants to communities, but partly to cumbersome administration.
- The $18 billion voted by Congress will be inadequate to assist in municipal sewage improvement needs, now estimated at $444 billion.
- The municipal, industrial, agricultural *discharge permit program*, the heart of the legislation, is behind schedule, and in too many cases has sanctioned existing pollution rather than stipulating improvements.
- Inadequate administrative procedures have provided no way of gauging the program's progress.
- One of the law's objectives of extensive public participation in the pollution abatement program has been almost completely fruitless.

The 15-member commission, composed equally of members of the Senate, the House, and the public, has not yet made any judgments on the findings. And to what extent the final report will affect Congress's current deliberations on the program is still uncertain.

What is certain, however, is that Train told Rockefeller he felt the report lacked balance and that it had failed to take into account either the complexities of the law or the EPA's limitations in manpower and money in administering it.

The law calls for waste dischargers to install the "best practical" treatment equipment by 1977, including secondary, or two-stage, treatment for community sewage, and "best available" equipment by 1983, with the goal of zero discharge by 1985.

But industry, the report claims, has made only about 20% of the expenditures needed to achieve the 1977 goal. And while the 1983 goal might be "substantially achieved for much of the nation's waters, so far the country has gone only about 25% of the way so that delay of the 1983 deadline seems inevitable."

Federal grants are scaled to cover 75% of municipal treatment plants' cost. To date, the report states, only $1.034 billion of the $18 billion has been spent. Why? Because of inordinately complex grant requests, and review and approval processes, which require almost two years from application initiation to contract bidding, the report claims. Also, of an estimated 47,000 discharge permits needed, which were supposed to have been issued by last January, only 28,000 have been granted.

Searching for a better image

"Whoever owns this tape recorder, it has stopped."

Russell E. Train, administrator of the Environmental Protection Agency, interrupts his statement on his concern about [illegible] controls. A reporter, one of a few dozen attending a press conference at the Water Pollution Control Federation's [illegible] convention center, dashes forward, turns the [illegible] thanks to the smiling man behind the microphones.



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These negative comments on grants and permits, however, are disputed by the EPA.

"The federal program has developed into one of the largest public works programs in the history of the U.S.," claims Andrew Breidenbach, EPA spokesman, "to a base of about 14,000 projects costing $14 billion that were funded for $5.2 billion in federal grants from 1956 to 1972. And another $18 billion in federal funds for $24 billion in total eligible costs was added by the Federal Water Pollution Control Act amendments of 1972."

And John T. Rhett, EPA deputy assistant administrator for water program operations, notes that the "grants program has accelerated from a relatively small grants-in-aid program before 1972 to a national major public works program since then." Some of the agency's problems, according to Rhett, include the need for criteria guiding the program, and regulations as well as raising the level of funding to a point where the projects could go into construction faster.

"This task is still underway," he points out. "But already the monthly rate of obligation of funds has been raised from $115 million in fiscal 1974 to $301 million in 1975."

The speedier issuance of these grants is sorely needed, many industry spokesman insist, because the pollution cleanup costs are staggering.

Indeed, cleaning the nation's lakes and rivers is estimated to cost industry and government somewhere between $97 billion and $130 billion by 1983, the National Commission on Water Quality figures. This is in line with estimates of the Council on Environmental Quality, which last year projected outlays of $88.5 billion by states and cities, and $43.9 billion by industry, through 1982. For example, with 130 companies reporting, a survey conducted by the Manufacturing Chemists Association shows that water pollution control costs, both actual and projected, continue to demand the greatest amount of money. At the end of last year, $1.2 billion had been invested. This is expected to rise by $1.5 billion to $2.7 billion by 1977. In comparison, air pollution investment currently is $825 million and is projected to increase by $749 million to $1.6 billion.

It's no surprise, therefore, that a lot of companies spend a fairly high percentage of their capital equipment investment on pollution control. Du Pont, for instance, was spending 13% on such controls as early as 1974. Company president Edward R. Kane told the Joint Economic Committee of Congress: "That means we're getting 13% less capacity for our investment dollar." And Tenneco Inc. reported recently that the combined effects of environmental costs and high interest rates were forcing the diversified manufacturer to shelve capital spending projects.



Everything possible to expedite permit program

Robert B. Schaffer:

Quoting government figures, Richard Schmidt, vice president and general manager of Ecodyne Corp., states some industries will put 10 to 20% of their total plant and equipment investment into pollution controls to meet existing federal laws.

"But before industry can make any dent in anticipated expenditures," he observes, "it must overcome its resentment toward dollars spent on pollution control equipment." And he adds to that: "Wastewater treatment equipment should be looked upon as an integral part of the plant process, with a role in total profitability, not as an add-on with second-class citizenship. Because of lack of enthusiasm for the concept of installing pollution control equipment, too many industries, I feel, are tempted to get by with the lowest possible initial capital dollar." And often, he notes, such factors as operating and maintenance expenses, equipment quality, supplier stature and adequacy of installed systems to meet probable 1983 requirements aren't considered.



Overcome resentment toward pollution money

Richard K. Schmidt:

But it's not only money that plants need. They must also get a discharge permit confirming that the plant is in compliance with both federal and state pollution control guidelines.

"Permits vary in duration and may not exactly reflect final discharge guidelines," says Robert Schaffer, director of permits of EPA's Office of Water Enforcement. "In many instances, such permits were written prior to the guideline date. In the great majority of these cases, the permits have been equal to or often more stringent than the finally promulgated guidelines."

While reaffirming that the 1977 deadline would be enforced, the EPA official assures industry that his agency will do everything possible to expedite the discharge permit program.

"We don't want to penalize anyone when we fail to complete administrative action on a proper application. If, for instance, a civil suit is brought against a discharger, we will expedite permit issuances," Schaffer promises.

By June 30, 1975, EPA and the 24 states with National Pollutant Discharge Elimination System (NPDES) authority had issued 20,091 industrial, 16,664 municipal, 1548 agricultural and 1988 federal facilities permits for a total of 40,291. (About 1600 permits have been challenged through administrative processes. Of these, more than 400 have been resolved).

Critics charge, however, that an estimated 47,000 discharge permits are needed, which were supposed to have been issued by last January. The EPA, on the other hand, claims that the permits it has issued so far cover 94% of "major" industrial dischargers, 10% of major municipal and 55% of all minor dischargers.

Proclaims Train: "We are moving, and we are moving in the right direction."

Some industry people agree. Declared W.R. Johnson, the General Motors director of plant and environmental engineering, at the International Pollution Engineering Exposition and

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Congress in Cleveland: "Industry can achieve the national goal enacted in 1972 that the discharge of pollutants into the navigable water be eliminated by 1985."

But others are skeptical of progress and direction of water cleanup efforts.

"From the standpoint of design, delivery and construction capabilities, 1977 anti-pollution objectives cannot be met with anything less than a crash program beginning immediately," warns Joseph E. Carter, senior vice president of the Rust Engineering Co., Birmingham, Ala.

Speaking before the Water Pollution Control Federation Conference, he noted that design and construction manpower is available, but not being fully utilized. The reason, he claims, is that most industrial firms have been reluctant to commit themselves to environmental control programs without positive assurance of compliance and total application to all competitors.

"Government regulations presently are behind schedule in establishing precise definitions of the term 'best practical technology'," Carter complains.

The EPA should look at "some approach other than regulatory overkill" to assure design and construction of water pollution control and abatement facilities, suggests H. Ben Faulkner, Jr., chairman of the Environmental Committee of the Professional Engineers in Private Practice. Bureaucratic red tape has "slowed some pollution control projects to a virtual standstill," he declares.

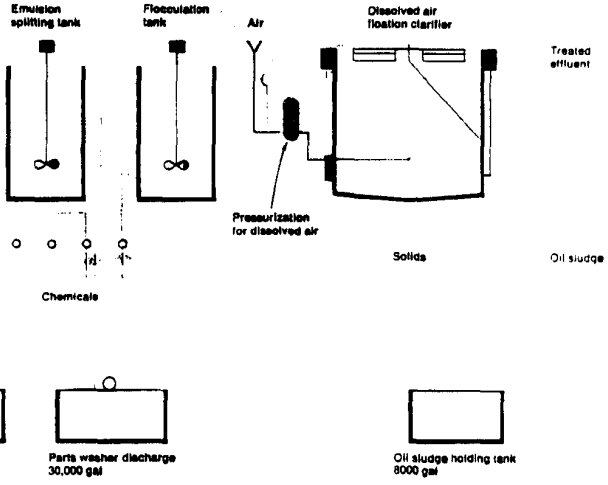
Not less critical is Frank J. Dillard, an environmental scientist with Engineering-Science Inc., Austin, Texas. The complete elimination of discharge of pollutants into navigable waters, an objective of the 1972 Clean Water Amendments, must be considered "speculative and conjectural at this time," he states.

Speculative particularly when it comes to so-called non-point pollution, according to many critics. It has serious repercussions for the future of the nation's water pollution control efforts, predicts William Whipple, Jr., director of the Water Resources Research Institute, Rutgers University, New Brunswick, N.J. Says he: "The current initiation by the EPA of *area-wide water quality planning in many* parts of the country, with grants that approximate $150 million, brings the somewhat neglected subject of non-point sources of pollution into the limelight, because the law requires its consideration in these studies." Such pollution, he feels, is "extremely flashy, because loadings often vary by two orders of magnitude in half an hour, so that the usual sampling programs and modelling of low-flow regimens may give misleading indications."

In fact, non-point sources of water pollution comprise more then 50% of the total water quality problem, according to Train, who admits that "There's much we don't know about non-point sources."

Says he: "There's little doubt that non-point sources will become a more and more acute problem unless vigorous action is taken to control them. All gains from point source control could easily be wiped out if nothing is done about nonpoint pollution."

And he adds: "Congress placed primary responsibility for the manage-



Technology is there: Flow of waste water through new Eaton Corp. pre-treatment plant at Axle Division in Cleveland

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ment of non-point source pollution in the hands of the states, and this is how it should be. We want to see localities, acting on a regional basis, getting more and more into the business of really facing up to these issues."

But many states are often slow in acting and facing up to these issues. Take New York State, for example, and Commissioner Ogden R. Reid of the State Department of Environmental Conservation. He recently moved to stop two General Electric plants from dumping highly toxic chemical compounds into the Hudson River. The compounds, PCBs (polychlorinated biphenyl) are responsible for so high a degree of toxicity in fish that the commissioner felt compelled to warn against eating striped bass from the polluted river.

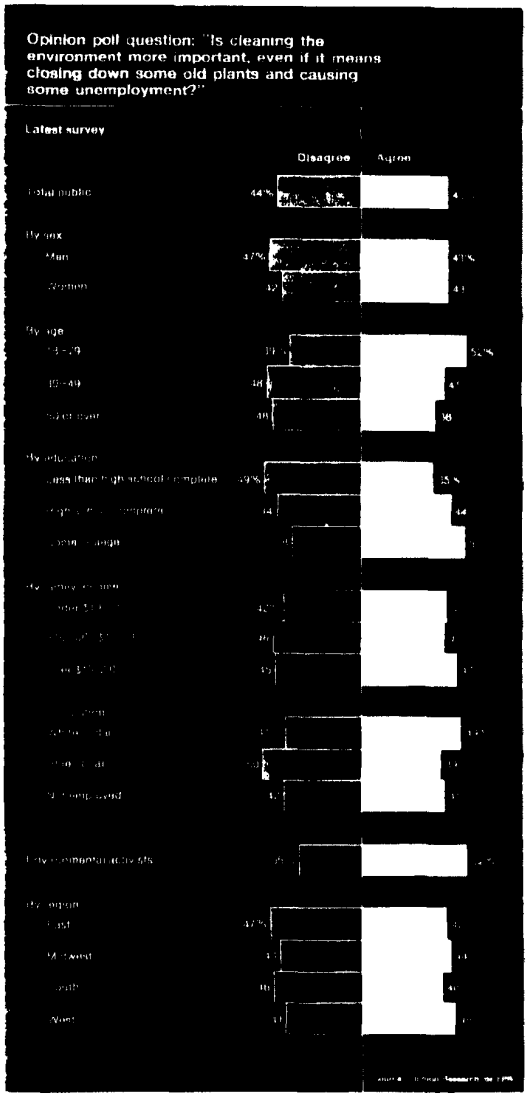
"Mr. Reid's action," wrote the *New York Times* in an editorial, "should have been taken long before he took office, since the hazardous discharge was known both to the EPA and the state agency. His observation that 'there's been a failure here' is hardly open to argument."

PCBs, which are used in the manufacture of electric equipment, paints and hydraulic fluids, among other products, have been proved poisonous to fish and severely damaging to the reproductive processes of many animals. In laboratory experiments, PCBs fed to monkeys have resulted in a high incident of miscarriages and sickly infants, while rats have developed liver cancer. Evidence is accumulating that PCBs may harm some wildlife, particularly ocean-feeding birds, and even the entire ecological food chain.

In 1968, more than 1000 people in Japan suffered an epidemic of a disfiguring skin disease, called Yusho, that later was traced to rice oil heavily contaminated with PCBs. The victims also suffered abdominal pains and disturbances in liver functions. The chemicals had been used as a heat-transfer agent in making the oil, which apparently had been contaminated by leaking equipment.

"Evidence of contamination now is being discovered far from industrial plants. It's all over the place," says Glenn E. Schweitzer, director of the office of toxic substances of the EPA.

Many plants contend, however, that further restrictions on the chemical would mean trading what they call a dubious health hazard for almost certain safety and economic problems. "Everyone talks of PCBs as if they were one chemical, but each commercial mixture can have 60 or more isomers," William Papageorge, manager of product acceptability, Monsanto Co., is



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quoted as saying. Each separate PCB is differentiated by the number and positioning of chlorine atoms on the molecule. It's the chlorine that makes the chemical fire retardent, but it's also the chlorine that causes pollution.

Environmentalists consequently are urging a ban on the chemical. "It's a hazard to human health, so there should be a complete phaseout of PCBs in every use as soon as possible," demands Karim Ahmed, a biochemist with the Natural Resources Defense Council in New York.

Such proposals for a complete phaseout imply that there's a substitute for their vital electrical applications. And there is, at least according to Dow Corning Corp. It claims that for transformers is has developed a workable substitute, polydimethyl siloxane, which is being used successfully in Japan and, ironically, produced by General Electric. GE says, however, there isn't any good substitute for PCBs in electrical gear right now, and that the risk of banning them would outweigh the risk of hanging on to them.

The PCB controversy, of course, raises the question: do we have the technology and processes to clean up the water and keep it clean—and to comply with federal standards?

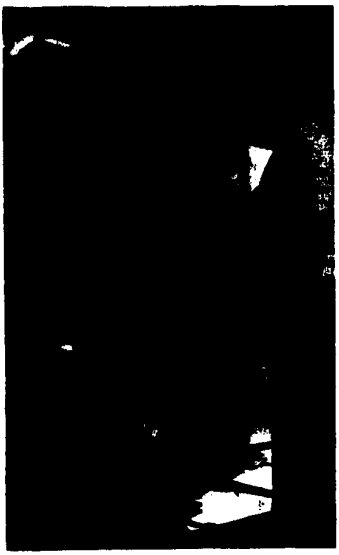
"Yes," asserts Roy F. Weston, P.E., board chairman of the firm that bears his name, "but there're some problems."

Elaborating, he says: "There are many plants whose existing facilities comply with the requirements. Many others have or will have received permits that were negotiated without benefit of pertinent promulgated guidelines. Still others have permits that recognize the existence of difficult technological pollution control problems but will not clearly define the problem and will not set effluent limitations. In these cases, the resolution of the undefined problems will remain a contingent liability of industry."

Yet, a lot is being done to develop either new techniques or, as Ecodyne's Don Mason, director, technical services, puts it, improve existing ones. Among them are his own firm's sludge concentrators, for example, which can meet the 12% solids criteria while cutting capital costs 50% and maintenance costs about 30% when compared to vacuum filters, centrifuges, or filter presses.

Or there's Eaton Corp.'s water pretreatment plant. It reduces the oil content of waste water from 100,000 mg/l to less than 100 mg/l. And Wastesaver Corp.'s wastesaver system eliminates chemical pollutants from wastewater discharge.

Futhermore, EPA's Train mentions the use of a chemical rinse instead of a water rinse in the electroplating industry, allowing the reclaiming of valuable copper and metal polluants. Not only does this return a profit, but also spares the life of fish in industrial waste streams. Similarly, the development of a process using steam instead of hot water to blanch foods gets rid of a substantial amount of pollution, conserves such nutrients as vitamins and minerals, allows more products to be canned, and also uses less energy.



Wastesaver system helps eliminate pollutants from wastewater discharge, meeting strict anti-pollution rules

But perhaps one of the most unusual means to clean dirty water is used by the National Aeronautics and Space Administration: it's a hardy, vascular plant with big leaves, thick stems and violet blossoms—the water hyacinth.

It removes water pollutants by absorbing them through its roots. Among the chemicals it briskly extracts are such insidious killers as strontium 90, lead, and mercury. In fact, the hyacinths are so greedy for such chemicals that NASA has measured toxic metals 10,000 times more concentrated in the plants than in the surrounding water.

NASA operates a water hyacinth system to remove its own chemical wastes and those of other government laboratories on its base at Bay St. Louis, Miss. The system has worked well, NASA claims. It consists of seven interconnected ponds teeming with water hyacinths. Where the water enters the first pond, it looks, smells, and is foul. Flowing from the last pond, it's clear and odorless. Within a month, the hyacinths are so saturated with chemicals that they can't absorb more. A newly developed machine harvests the old plant. The remaining hyacinths quickly produce new ones. One hyacinth, a NASA official says, can breed about 65,000 offspring annually.

Although a lot remains to be done, such ingenuity has already led to encouraging results. Train will tell you, for example, that just a decade ago, Lake Erie had been given up for "dead" by biologists. The Escambia Bay in Florida faced a similar prognosis. In both cases, the waters have been revived to the point where fish life not only survives, but is thriving and now salmon are being caught in the Grand River, some 30 miles upstream from Lake Michigan, where before only carp and sucker survived.

Exclaims Train: "And in Marlborough, Mass., the miller who works the old Grist Mill on Hop Brook can now see through the water to the bottom of the wheel for the first time in his 23 years at the site."

The future? Some plant closings, no doubt, but also abatement extensions, case by case, as the EPA head puts it, because of technological impossibilities or lack of federal funds. Simpler and more streamlined government regulations as Congress starts to deal more actively with the tangled triumvirate of economic, energy and environmental ills. And greater efforts to search out more cost-effective ways of doing things, taking economic and energy costs into account.

Advice to both industry and regulatory agencies? States Mark D. Hollis, a member of the Florida State Environmental Regulation Commission and past president of the Water Pollution Control Federation, quoting Sir Francis Bacon:

"He that will not apply new remedies must expect new evils—for time is the greatest innovator—and, if time alters things to the worse, and wisdom and culture shall not alter them to the better, what shall be the end?"

Bacon, the great English statesman and philosopher, of course, helped man out of the Dark Ages into the Renaissance. □

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