INTERNATIONAL

Projects of the U.S. Agency for International Development (AID) worth more than $2 billion have been canceled or postponed because of environmental concerns, according to results of an AID survey. Congress had called on AID to report on the environmental consequences of Third World projects supported by multilateral banks, including the World Bank. Of the 28 projects surveyed, the largest is a $1.2-billion development on the Narmada River in India that is being delayed pending an environmental review by the Indian government. Another project on India's Cauvery River has been canceled because the World Bank will not support it. Other affected projects include a river dam in Nepal and a tree-planting program in Haiti.

Soviet scientists and U.S. environmental advocates have joined in a call to preserve tropical rain forests. In a statement released by the Environmental Policy Institute (Washington, D.C.) they warn that unless there is a halt to the destruction of tropical forests, currently estimated at 16 ha/min, as many as 1 billion persons living in the tropics may starve to death during the next 30 years. Moreover, the global climate will be altered, deserts will be created, and millions of species of plants and animals will face extinction. The scientists propose a joint U.S.–Soviet project to demonstrate forest conservation in Madagascar, where 50% of the forests have been lost because of demands for agricultural land and fuel wood.

FEDERAL

Senate Majority Leader Robert Byrd (D-W.Va.) said April 8 that he opposes acid rain control legislation. Citing "deep concerns" about environment, Byrd also expressed worries about losses of jobs in his coal-producing state, already hit by high unemployment. Coal-burning emissions are a major cause of acid deposition. Byrd has introduced a bill to furnish $3.5 billion in matching grants to states to help pay for developing cleaner methods of burning

Byrd: Acid rain laws cost jobs

coal. He said this "would achieve a broad set of energy and environmental goals without causing economic disruption." Although his opposition reduces prospects for passage of an acid rain law, members of Congress plan to press for one anyway.

More stringent motor vehicle emissions inspection and maintenance programs could reduce hydrocarbon emissions, and, by extension, tropospheric ozone, according to Richard Wilson, director of EPA's Office of Mobile Sources. Wilson spoke at an APCA conference on mobile emissions in late March. He suggested that poor maintenance, fuel switching, and engine tampering cause more hydrocarbon emissions than do "design-level tailpipe emissions." Hydrocarbon emissions are ozone precursors. Wilson said the agency is encouraging state vehicle inspectors to investigate tampering and fuel switching, which, he says, could reduce the rate of tampering and fuel switching by as much as two-thirds. According to EPA estimates, 20% of vehicles in use may be tampered with, and 10% of owners may be illegally switching fuel.

EPA has reaffirmed its assessment that formaldehyde is a likely human carcinogen. The agency released a report in April that estimates that two of every 1000 persons who move into typical new mobile homes and remain in them for 10 years will contract cancer as a result of breathing formaldehyde vapor emitted by materials used in mobile home construction. Some garment workers have three chances in 1000 of contracting cancer, according to EPA. The federal government has been concerned about health risks associated with formaldehyde since 1980; the Department of Housing and Urban Development imposed emissions limits in 1984. EPA and other federal agencies plan to use the latest risk estimates, derived from EPA's most comprehensive study to date, to regulate human exposure to formaldehyde vapor in work places and elsewhere.

Drinking-water suppliers will have to warn their customers about potential sources and health effects of lead, even if they are not violating the national lead standard of 50 ppb, according to an EPA proposal mandated by the Safe Drinking Water Act. Notices must be sent to customers by June 1988. In addition to listing sources and health effects, the notices must explain how lead content in drinking water can be reduced and what steps the supplier is taking to reduce lead content. Suppliers also must explain how the individual householder can reduce lead levels in water already delivered. EPA is proposing that the notices be sent once a year for five years. States that fail to enforce the new reporting requirements can face 5% losses in federal grants to public water systems.

Ethylene dibromide (EDB), a pesticide banned in the United States since 1984, would be used to eradicate Mediterranean fruit flies in Guatemala if the Department of Agriculture (USDA) has its way. EDB also is banned in Guatemala, although the government has been under pressure from U.S. officials to lift the ban. As part of a U.N.-sponsored eradication project in which the U.S. government plays a lead role, the program also calls for the aerial spraying of malathion, an organophosphorus insecticide; this method of application is prohibited in Guatemala. USDA officials hope to persuade Congress to provide funding for a campaign that would eradicate Medflies in Guatemala before the pests migrate to the United States. One-half of the $350-million project would be paid for by the U.S. gov-

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ernment. Last fall, the World Bank rejected a United Nations request to fund the program.

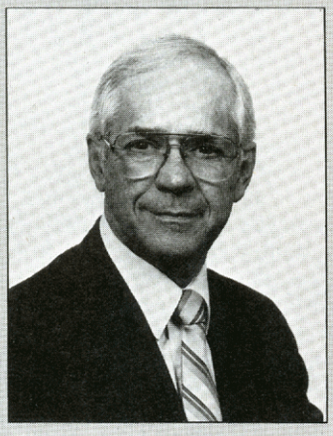
Efforts to control pollution, particularly from point sources, have improved the nation's streams, according to a March report issued by the U.S. Geological Survey (USGS) and the Johns Hopkins University (Baltimore, Md.). The report describes the first detailed analysis of water quality trends based on long-term, standardized measurements of 24 constituents or properties of water taken at almost 400 sites nationwide. Sixty-seven of 295 water-monitoring sites showed decreases in sewage pollution (eight showed increases and the balance showed little change). Dissolved lead levels have decreased at 66 of 292 sites. Dissolved oxygen levels, however, have not increased as much as expected, and levels of arsenic, cadmium, and nitrogen have risen.

STATES

Scientists in Virginia are studying the effects of acid deposition on trout streams in the western part of the state. Their work is part of a two-year study of the effects of pollution on stream chemistry. The study was commissioned by the Virginia Commission of Game and Inland Fisheries. Trout were chosen for study because they are extremely sensitive to stream acidification. The aim of the study is to develop a baseline from which to assess changes in the chemistry of the state's streams. Rain samples obtained at eight locations show an average pH of 4.3. Over the past six years, the acidity of Deep Run, a stream in Shenandoah National Park, has increased from pH 5.8 to pH 5.4, according to Virginia researchers.

Researchers at the Texas Water Resources Institute (College Station, Tex.) have been mystified by massive fish kills in the Trinity and Pecos rivers from 1970 to 1986. The Trinity flows through Fort Worth and Dallas and receives urban and agricultural discharge and runoff; nevertheless, no one can state authoritatively that these factors killed the fish. The Pecos is a saline river that flows through rural west Texas; researchers from the Texas Water Commission have suggested that *Gymnodinium,* a dinoflagellate, and *Pyrmnesium parvum,* a golden alga, may have been responsible for those rural kills. This also cannot be stated conclusively. Scientists also do not understand why the number of Pecos fish killed rose in 1985 and 1986; suggestions range from the Pecos River's increasing salinity to the dumping of oilfield brine.

A district court in California has fined the city of Los Angeles for repeated permit violations at its Hyperion Sewage Treatment Plant. The $625,000 fine, which is the largest ever imposed on a municipality, is part of a consent decree in the U.S. District Court for the Central District of California. The decree requires Los Angeles to improve its sewage collection, treatment, and disposal systems to meet federal and state requirements. EPA estimates that the city will have to spend more than $2.3 billion to complete the improvements.



***Rowland:** Public opposed to waste sites*

If Monroe County, Ga., becomes a repository for high-level nuclear waste, economic growth there may suffer, says Rep. J. Roy Rowland (D-Ga.), who represents that district, which is about 70 mi southeast of Atlanta. He believes that a repository could be constructed and operated safely, but he cites public opposition to nuclear waste sites. Another problem is that the Georgia Department of Natural Resources has determined that Monroe County geology makes the site unsuitable. Officials of the U.S. Department of Energy have been considering that area as a site for an East Coast repository.

Last Chance, Colo., about 80 mi west of Denver, will be the site of a hazardous-waste treatment center that has been praised by Colorado and EPA Region VIII officials as the best of its kind. The site has received permits from EPA and the state and is expected to go into operation in September 1988. The facility will consist of 16 burial cells, storage for 600 drums, 6 storage tanks for liquid hazardous waste, and 3 surface impoundments. The cells will hold a total of 1.875 million m^3 of hazardous waste, and the tanks will hold about 875,000 L of liquid wastes. The state will impose a tax of $2/t to pay regulatory costs. The site is permitted under the Resource Conservation and Recovery Act and will be operated by Browning-Ferris Industries.

SCIENCE

Radiocarbon dating can be used to determine the origin of atmospheric contaminants, according to scientists at the National Bureau of Standards (Gaithersburg, Md.). Analysts can ascertain whether a carbon-containing contaminant is natural or man-made and whether man-made pollutants originate from stationary or mobile sources by determining the ratio of carbon-14 to carbon-12. The determination is made by accelerator mass spectrometry, which can provide reliable analyses from microgram samples.

A data base consisting of more than 60,000 indoor radon concentration measurements has been compiled with the aid of Track Etch radon detectors. H. Ward Alter and Richard Oswald of Terradex (Walnut Creek, Calif.) reported in the March 1987 issue of the *Journal of the Air Pollution Control Association* that the data base contains such information as the location of the detectors, average radon concentration over time, type of detectors, dates of detector installation and removal, and the duration of measurement. Radon concentrations are given in picocuries per liter of air. In six states in which more than 1000 measurements were made, indoor radon concentrations were in the range of 0.06–1024 pCi/L; the highest percentage of measurements, 24.41%, showed levels of 1–2 pCi/L.

TECHNOLOGY

Ligninase is an enzyme that can destroy many chemical, papermaking, and agricultural wastes. The substance is obtained by cloning a gene from the wood fungus *Phanerochaete chrysosporium,* according to Ming Tien and David Tu of Pennsylvania State University (University Park, Pa.). It degrades lignin, a major component of wood, and Tien and Tu found that it also decomposes organic contaminants such as DDT and benzo[*a*]pyrene. The decomposi-

tion products then are broken down to carbon dioxide by natural processes. Tien and Tu also have described the nucleotides that make up the gene to provide an understanding of how the gene works. Tien hopes to splice the gene into a yeast to make large quantities of ligninase inexpensively. Tien and Tu reported their findings in the April 2, 1987, issue of *Nature*.

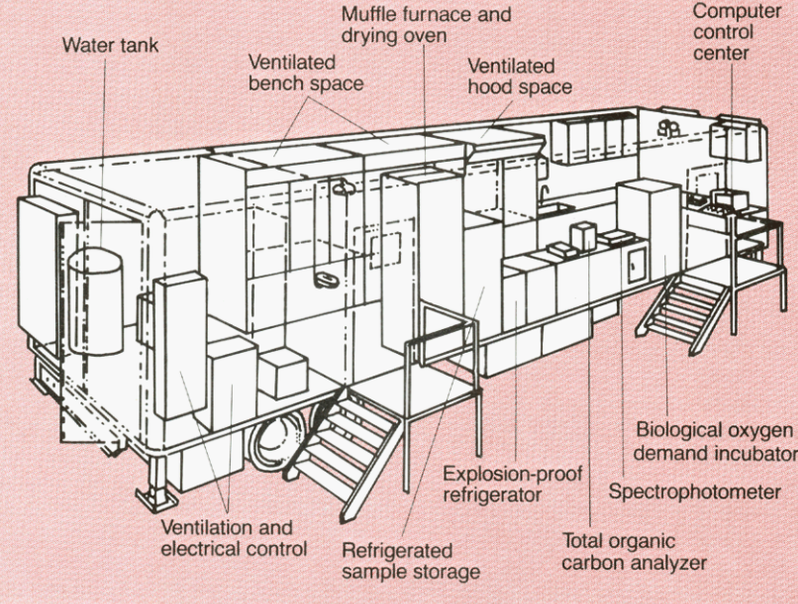
A biological method for denitrifying drinking water is being tested by the Three Valleys Municipal Water District and the city of La Verne, Calif. A test unit treats 200 L/min of nitrate-contaminated water. The water is passed through an oxygen-free environment in which methanol is fed to bacteria; the microbes consume the nitrate as the water passes through the unit. If the test is successful, a large-scale unit will be built to treat 2000–8000 L/min. Groundwater is the main source of drinking water in the area, and much of it is contaminated with nitrogen-containing agricultural runoff.

Rexnord Technologies (Milwaukee, Wis.) is deploying a fleet of vans for pilot studies of hazardous-waste treatment technologies and analyses of hazardous waste. Four of the five vans are equipped to test biological and physical–chemical methods of treating and neutralizing toxic wastes; the fifth will contain an analytical laboratory. The aim of the pilot studies is to provide plant managers and engineers with information necessary to make decisions regarding in-plant treatment process control and recommended treatment methods. Rexnord also will help determine costs of complying with hazardous-waste limitations. The project is being funded by a $4-million contract with EPA.

More than 70% of the oxides of nitrogen (NO_x) can be removed from flue gases at coal-fired power plants by the addition of ferrous hexamethylenetetramine, Fe(II)*HMTA, to the mist used to control sulfur dioxide (SO_2). John Harkness, leader of the team at Argonne National Laboratory that developed the process, says the addition of Fe(II)*HMTA does not affect a wet scrubber's ability to remove more than 90% of SO_2 from flue gas. He says the chemical works even better with high-sulfur coals because the process benefits from sulfur–nitrogen compound reactions. Harkness estimates that the process will raise electricity costs by $0.001/kWh; conventional NO_x removal processes cost $0.0083/kWh.

Hazardous vapors, dust, and odors can be controlled with vapor-suppressing foam during remediation of hazardous-waste sites. The material, developed by 3M (Minneapolis, Minn.), is mixed with water and sprayed on areas being excavated—for example, at Superfund sites. The foam forms a layer that covers the surface and prevents vapors, including those from volatile organic compounds, dust, and odors, from escaping. Spokesmen for 3M say the foam was developed to quench petroleum and chemical fires, and its use lessens the need to place expensive temporary dirt coverings and sealed enclosures over hazardous-waste excavation sites.

Mobile analytical laboratory



Source: Rexnord Technologies

BUSINESS

Midwest Research Institute (MRI, Kansas City, Mo.) has received a $2-million contract from EPA to develop a regulatory program for underground storage tanks. The program is required by the Resource Conservation and Recovery Act amendments of 1984. MRI will identify and evaluate methods to detect or prevent releases from underground storage tanks and outline ways to take corrective action if a release occurs. The institute also will find ways to combat or avoid risks to human health and the environment. About half of the work from the three-year contract will be performed by subcontractors.

The Hazardous Waste Treatment Council (HWTC, Washington, D.C.) has warned of a disturbing increase in the uncontrolled burning of hazardous wastes. HWTC charges that EPA and several states are allowing operators of mines, smelters, and industrial furnaces to burn wastes without the environmental controls that would be required of commercial incinerators. Many of the operators claim exemption from requirements for environmentally controlled incinerators on the grounds that they are recycling the wastes. Executive Director Richard Fortuna has sent letters to EPA in which he calls on the agency to close what he says is a regulatory loophole that can exacerbate hazards to human health and the environment.

Although the solar energy industry has declined, the outlook for photovoltaics is good, according to Bruce Hunn, head of the solar energy program at the University of Texas's Center for Energy Studies (Austin, Tex.). He blames the decline on the precipitous drop in oil prices during 1986. Hunn is optimistic about the future of photovoltaics, however, because he foresees increases in the cost of oil and a rise in environmental problems resulting from expanded use of coal. He predicts that costs of photovoltaics, now at about $9/peak watt, will come down. He also notes that solar energy does not produce waste and that photovoltaic systems have no moving parts to become defective.