

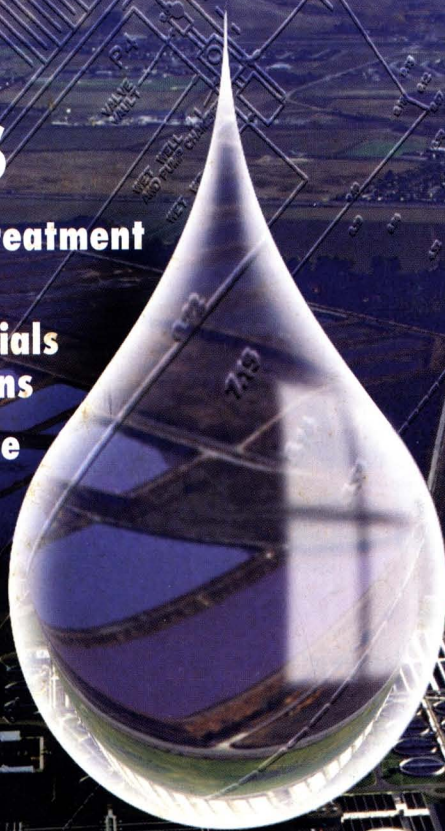
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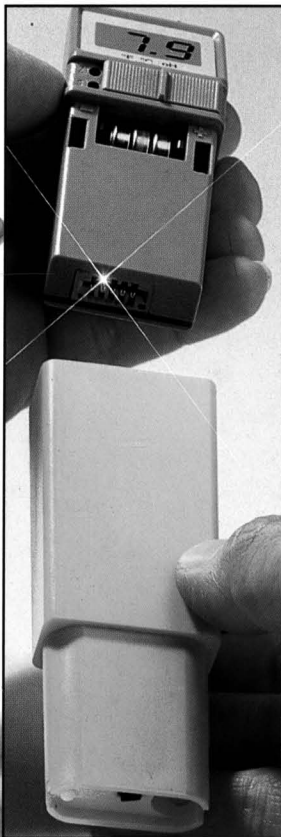
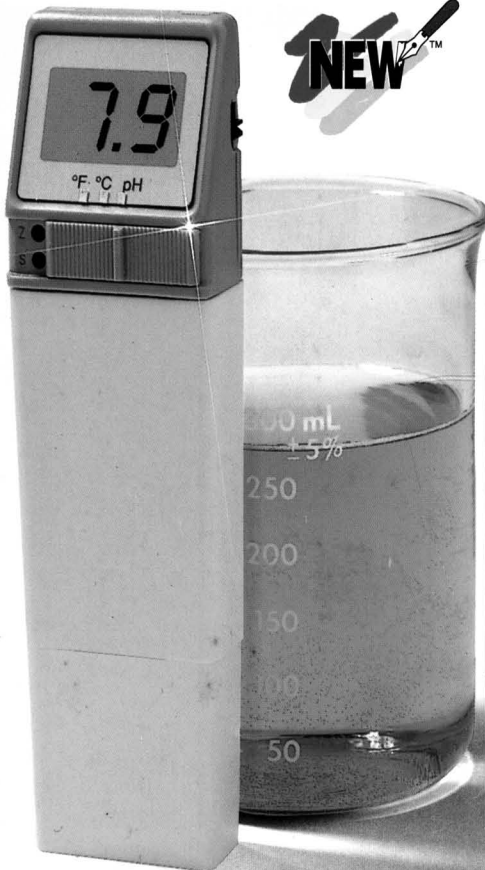
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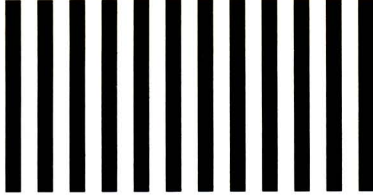
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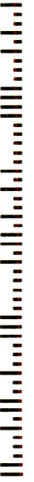
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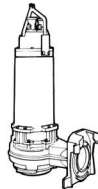
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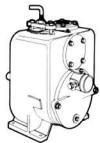
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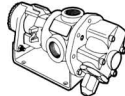
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Drinking water, wastewater, stormwater, biosolids: EP's May Water Focus runs the gamut of water issues, including new technologies, management trends and regulatory perspectives.

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ENVIRONMENTAL PROTECTION (ISSN # 1057-4298, USPS #006-703) is published 12 times a year, © 1995 Stevens Publishing Corp., 3630 IH-35, Waco, TX 76706. Phone (817) 776-9000, Second Class postage paid at Waco, TX 76702-2573 and additional mailing offices. Subscription rate for Environmental Protection is \$113 for 1 year. Subscriptions mailed to Canada please add \$22, to Mexico, please add \$18. For all other foreign countries, please add \$30.

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Clean Water Bill: A Reflection on Reform

The House of Representatives' reform juggernaut has made its mark on the first of several environmental laws due for an overhaul by the 104th Congress. Judging from the swift committee passage of a Clean Water Act reauthorization and the far-reaching changes it would impose, environmental professionals should brace themselves for a tumultuous summer.

The bill, H.R. 961, bears little resemblance to the Clean Water rewrites of years past. And unlike last year's endless haranguing over wetlands provisions that left the water bill high and dry behind committee doors, this year's House Transportation and Infrastructure Committee packaged and passed a rewrite in time for the much-ballyhooed "100 Days" celebration of the House Republicans "Contract with America."

In keeping with the GOP's self-styled reform agenda, cost-benefit analysis and risk assessment are central themes of the reauthorization. So is the controversial "takings provision" promised in the Republican Contract, which makes its debut in the bill's wetlands section. Landowners whose property is devalued by 20 percent or more by a wetlands designation are entitled to government compensation under the measure.

But most dramatic is the bill's overhaul of permitting and stormwater requirements. Trumpeted by proponents as a "less is more" model for federal regulation, the measure would add flexibility to current permitting requirements by, for example, giving states authority to rewrite permits to account for pollution prevent measures. And the five-year-old stormwater permitting program would be replaced by non-regulatory management standards (See article, page 16.)

For those on the front lines of water regulations – compliance managers, municipal POTW managers, consultants and technology developers – the reauthorization bill poses some interesting paradoxes. While more flexibility is surely needed in federal environmental rules, those who have made substantial investments in environmental technologies are loath to see an outright "rollback" in federal requirements. Another concern, particularly for companies with facilities in several states, is the specter of newly empowered state regulatory agencies, each with a unique set of compliance rules.

Consistency in federal rules ranks high on industry's wish list. Indeed, as CH2M Hill's Nancy Gardiner and Jennifer Cohen note in an informal survey of industrial and municipal compliance managers on their stormwater management programs (page 14), regulatory complexities have proven a formidable obstacle in that program. More so, in some cases, than the technical challenges of monitoring stormwater runoff.

The technology innovations that help drive the environmental field, however, continue to provide new tools to achieve compliance with greater efficiency and lower cost. This month's focus on water issues includes a look at two methods for treating water and wastewater. And a case study examines one of the largest and most controversial sludge reuse projects since EPA issued its reuse regulations in 1993.

The growing emphasis on voluntary environmental management programs has spawned a new member: EPA's Building Air Quality Alliance. EP Senior Editor Stephen Davies talks with program director Bob Axelrad about the goals of the voluntary indoor air management program and why companies may want to sign on (page 36).

Voluntary approaches are one way to harness economic incentives to achieve environmental results. Another is creating flexibility in federal rules to allow innovation to play a part. In its efforts to reform environmental rulemaking, members of Congress would be wise to remember those points.



Thomas E. Barron
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LETTERS

To The Editor:

While agreeing with most of what was said by Jon Seveney in his article, *Waste Determination: A New Use for MSDS* (March 1995, page 60), I am wondering why he left out a very important bit of information. While it is true that OSHA's recommended format has been the most widely used in the past, this is no longer the case.

A few years ago the Chemical Manufacturers Association began working on a standard to develop consistent and understandable MSDSs that would be easily recognized in the U.S., Canada and Europe. This standard, submitted to and accepted by the American National Standards Institute (ANSI), is now under consideration by OSHA for incorporation into its revision of the Hazard Communication Standard.

It is not known if or when OSHA will adopt the ANSI standard as law, but many manufacturers in the US have chosen to rewrite their MSDSs in this format. They have determined that the new format is more consistent with Canada and Europe and not only helps trade with foreign countries but

allows for the incorporation of other, increasingly important information (such as ecological information) into their MSDSs where there had previously been limited room and a tendency to cram some information under heading that were not entirely consistent with the listed information. Thus making it difficult for the untrained eye to locate certain data.

If Jon Seveney is the hazardous waste coordinator for Shell Oil Co.'s Eastern Region, I would have thought he'd have mentioned this information - considering that the new ANSI format makes it a lot easier to locate specific information and thus further drives home his point that MSDSs can be a valuable tool in reducing the need for costly TCLP analysis in hazardous waste determination.

Maureen Gannon
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Correction

The table accompanying the March 1995 article, *Zero Discharge: More Than a Pipe Dream* (page 56), wrongly indicated the unit of measure for contaminant levels in drinking and ambient water standards. The amounts listed in the table are measured in micrograms per liter.



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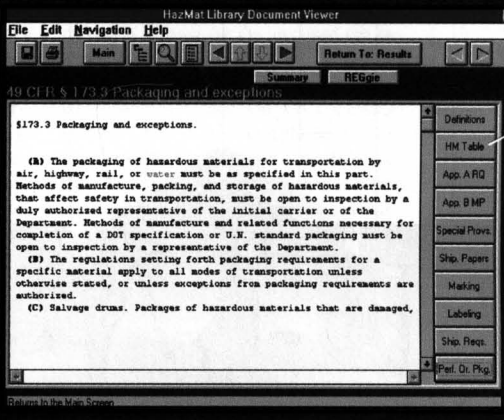
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NEWS UPDATE

EPA: 'Tiered' Accident Prevention Approach Would Save Money

In an attempt to make the regulations fit the risk, EPA wants to use a "tiered" approach for a chemical accident prevention program slated under the 1990 Clean Air Act Amendments. The number of plants subject to detailed risk management planning requirements could be reduced by as many as 100,000 under EPA's new proposal.

The accident prevention program is one of the most far-reaching of the Clean Air Act amendments. Following EPA's original proposal in October 1993, many industries complained EPA had underestimated the rule's cost. They also said that because the proposal applied to all facilities that handle more than a specified amount of certain chemicals, it would actually make it more difficult for states and other agencies to focus on the most serious risks.

In response, EPA published a supplemental notice in the March 13 Federal Register. In it, the agency proposed three tiers representing increasing levels of effort. Tier 1 fa-

ilities would prepare a brief risk management plan and certify that their worst-case accidental release would not reach any "public or environmental receptors of concern," the notice said. Facilities with an EPA-defined "significant accidental release" in the past five years would not be eligible for Tier 1, which EPA said "would be most suitable for operations that handle flammable substances or explosive substances in locations that are relatively distant from the public."

Tier 2 would require sources to conduct an offsite consequence analysis, document a five-year accident history, implement prevention steps, have an emergency response plan, and submit a risk management plan summarizing those elements. But EPA would not require specific steps to comply with the prevention and emergency response programs.

Tier 3 would require a full risk management program as originally proposed for all sources. Under what the agency called its "preferred approach," Tier 3 would include industries in specific four-digit SIC codes that meet certain employment and release

criteria. EPA said eight such SIC codes have an accidental release history that supports Tier 3 requirements: 2611 (pulp mills), 2812 (chlor-alkali), 2819 (industrial organics not elsewhere classified), 2821 (plastics and resins), 2869 (industrial organics not elsewhere classified), 2873 (nitrogen fertilizer), 2879 (agricultural chemicals not elsewhere classified), and refineries.

EPA Audit Policy Would Trim Penalties

EPA has issued an interim environmental audit policy encouraging companies to perform audits with three new incentives.

In the April 3 Federal Register notice, EPA said it would eliminate punitive penalties for companies or public agencies that voluntarily identify, disclose and correct violations, and reduce punitive penalties by up to 75 percent for companies that meet most, but not all, of the conditions outlined in the policy. It also promised not to ask the Justice Department to bring criminal charges against a company it deems has acted in good faith

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NEWS UPDATE

to identify, disclose and correct violations, provided no actual harm has occurred. And the agency said it would no longer request voluntary environmental audits as part of its enforcement investigations.

The announcement preceded by a few days the release of a survey by Price Waterhouse showing that nearly two-thirds of companies that now perform environmental audits would expand such programs if assured they would not be slapped with penalties for compliance problems uncovered during audits.

Despite the interim policy, EPA will reserve the right to collect full civil penalties for criminal conduct, repeat violations or violations that present imminent and substantial endangerment. Nor will companies be allowed to get an advantage over competitors through delays in compliance.

The interim policy has been nine months in the making, during which time EPA has held public meetings, reviewed 80 written comments and held focus groups. The policy took effect April 18. Comments are due by June 2. Submit three copies to EPA Air Docket, Mail Code 6102, 401 M St. SW, Washington, DC 20460.

Cement Industry Plan To Manage Kiln Dust

EPA efforts to draft cement kiln regulations have been put on hold as the agency considers an "enforceable agreement" to control cement kiln dust submitted by industry representatives.

The proposal follows EPA's Jan. 31 announcement that it plans to issue stricter management controls for cement kiln dust, which is currently exempt from Resource Conservation and Recovery Act hazardous waste management requirements.

The American Portland Cement Alliance and the Cement Kiln Recycling Coalition said their agreement is consistent with the Clinton administration's efforts to "reinvent" environmental regulations. Under it, kiln operators would sign a contract with EPA, beginning a five-year implementation period. After five years, land disposal of cement kiln dust would be restricted to a monofill with site-specific monitoring and management practices. Management schemes would have to assure "no projected release of constituents of concern for the operational life of the unit plus a 30-year post-closure period," according to the agreement.

If EPA discovered violations of the contract, the agency would be able to assess

three classes of penalties: \$250 per day, \$1,000 per day, or \$2,000 per day, based on predetermined severity criteria.

"We're very encouraged that they are finding a creative way to address [dust] management problems," said Jim Berlow, deputy director of the waste management division in EPA's Office of Solid Waste. The agency hopes to make its decision on the proposal within one or two months, Berlow said.

Recyclables Trading on Commodities Market

Armed with a \$200,000 grant from EPA, the Chicago Board of Trade is ready to develop an electronic trading market for recyclable materials. In addition to making electronic cash exchange possible, the new system will provide price and quality information for buyers and sellers of recyclable materials.

continued on page 60

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Industry Impressions

By Nancy E. Gardiner &
Jennifer A. Cohen

Many manufacturing, waste management, transportation, and mineral resource companies have risen to the challenge of complying with a complex set of regulations – the 1990 stormwater rules – in a competitive marketplace. But many others have struggled to meet what they call confusing, even contradictory requirements. Industrial environmental managers and regulators give widely varying assessments of the five-year-old program.

Initially, facilities were given three options to comply with the stormwater rules: obtain an individual permit, join a group application, or wait for the state or regional EPA office to issue a general permit. At the time, many facilities chose the group application approach, because it offered reduced monitoring requirements and was the least expensive alternative. But certain states belatedly rejected the group approach, leaving many facilities without a viable permit long after the rules had become effective. Other facilities found that individual permits, while appropriate for certain complex facili-

ties, included more stringent approval requirements.

In the end, many facilities opted for a general permit issued by a state agency in states with delegated permit authority, or by one of EPA's 10 regional offices. The general permits offered a streamlined application process that required less data than the individual permits and were less confusing than the group permits.

Compliance Requirements

It's taken about 20 years, but industry has largely achieved compliance with the numeric effluent limits for point source discharges in the Clean Water Act. The new engineering controls needed to accomplish that job may have been easy compared to controlling non-point sources such as stormwater. Without numerical effluent limits or proven controls, it will probably take more time to achieve a similar level of compliance. Facilities began to get a taste of the difficulties soon after EPA issued its first set of regulations in 1990.

The 1990 regulations were vague, without many minimum requirements or standards. As such, they presented an opportunity for some managers to develop creative pro-

grams, while leaving others confused and searching for help. During the first year of regulation, facilities had to develop a site-specific stormwater pollution prevention plan (SWPPP), eliminate improper connections to the storm drain system (such as from sanitary or process water systems), and begin monitoring the quality of their stormwater runoff. The plan's focus was on selecting and implementing best management practices (BMPs) or control measures designed to eliminate pollutants at their source or before they left the facility boundary. The regulations did not set minimum standards for BMPs, but left it to individual facilities to choose among those that made the most sense.

Similar flexibility was built into the monitoring requirements, which meant that in some states, facilities could select their own sampling parameters. That wasn't true everywhere. In California, for example, facilities were required to analyze for indicators such as pH, conductivity, total suspended solids, oil and grease, and total organic carbon. Older facilities, particularly in the East, were faced with identifying plumbing connections (often underground, without the aid of specification drawings or as-builts), and replumbing them so that they did not discharge into the storm drain system. Often, this proved both costly and time-consuming.

Having completed the SWPPP and any necessary replumbing, most facilities were able to settle into routine compliance: monitoring their stormwater, conducting visual observations to identify pollutants and gauging BMP effectiveness, followed by annual reporting to the administering agency.

Suggestions from Managers

We interviewed a cross-section of regulators and managers of industrial facilities in order to obtain a "snapshot" of the stormwater program's front lines — and garner suggestions that might help others. The facilities included a large aerospace corporation, a nationwide food processing company, a local newspaper publishing company, a scrap recycler, a small tool manufacturer, and a wood preserver. Regulators in California and Washington state also spoke to us about their experiences. While by no means comprehensive, those interviewed offered some suggestions that may benefit others who are trying

to comply with current regulations. The survey was conducted through telephone discussions, based on a questionnaire.

Not surprisingly, the level of compliance varied widely among the facilities. Many have integrated the stormwater requirements into their overall environmental compliance



Since stormwater compliance requirements overlap somewhat with other environmental regulations, some industries have been able to "double up" on certain programs.

programs, while others have yet to file a Notice of Intent to comply or completed their required first-year activities.

By and large, most facilities that chose to apply for general permits said they had been fairly easy to comply with, and felt the program has improved stormwater quality. But they were confused by the group application process, which many states refused to use. In addition, those who have filed under it have yet to receive the so-called "multisector" permit. In November 1993, EPA proposed permits for 29 different industrial sectors, but the agency has yet to issue the final permits.

The amount of time facilities said they spend on implementing their stormwater pro-

grams varied widely, depending on the size and complexity of the operation and the number of personnel. The compliance manager of one large aerospace facility said his department spends about 1,000 hours per year implementing his company's program — about half of those hours allocated to environmental compliance. That facility is located in a city that has particularly tough environmental controls, including some pertaining to stormwater. By contrast, small facilities typically struggle with the paperwork and reporting requirements more than compliance monitoring.

Since stormwater compliance requirements overlap somewhat with other environmental regulations, some industries have been able to "double up" on certain programs to save money and still obey the law. Examples include the Spill Prevention Control and Countermeasure (SPCC) and contingency planning regulations under RCRA, which require secondary containment and rapid spill response — controls also appropriate for stormwater management. Rules requiring environmental training programs for facility personnel can also be integrated since training is part and parcel of the stormwater program.

Monitoring Biggest Problem

The area that appears to cause the most problems — and does not overlap much with other compliance programs — is monitoring.

Industries responsible for sampling at facilities located in different cities are faced with the challenge of getting to the site with enough time to capture the first flush. Some have solved this problem by installing automated samplers, an often expensive alternative that is not feasible for many facilities. A number of respondents said visual observations did not yield much valuable information or did not change much from month to month. At the same time, facility managers said they did not indicate anything about the presence of pollutants or effectiveness of BMPs.

In order to review and update your SWPPP, you should examine your BMPs to ensure they are controlling stormwater pollutants. However, there currently are no standards to measure BMP effectiveness. Since there are no effluent limitations, it is not as simple as analyzing the water quality of

Major Changes Slated for Stormwater Regulations

In their efforts to revamp the Clean Water Act, Republican lawmakers in Washington have taken particular aim at five-year-old stormwater regulations.

Before mid-year, the House of Representatives may well approve a Clean Water Act bill that would give much more leeway to states and other permitting authorities to tailor stormwater requirements. One key change: Water quality standards would be used as goals rather than hard-and-fast requirements.

"Now if you're covered by a stormwater permit, you have to put in place a stormwater management plan that will get you on a schedule to meeting water quality standards," said Diane Shea, associate legislative director of the National Association of Counties. But H.R. 961, the House bill, would let permittees determine "which waters need protection and then work with communities to determine the best way to achieve that protection," Shea said.

In some states, water quality problems "may not necessitate a permit" under the bill, Shea added. The bill "gives states great

flexibility to design things that fit their own particular needs."

Of course, when it comes to legislation, it takes two. And the Senate, where moder-

*A Clean Water bill
would shift enforcement
and permitting
to the state level.*

ate Republican Sen. John Chafee (R-R.I.) heads the Environment and Public Works Committee, is unlikely to accept the House bill as is. Chafee has said he is unwilling to reauthorize the entire act this year.

That would probably sit well with environmentalists. The Natural Resources Defense Council, which takes a very strong

interest in water issues, says the bill stretches regulatory deadlines for stormwater too far.

"Under this program, the current target to do anything is 20 years from now," said Peter Lehner, an NRDC senior attorney. While it would allow voluntary pollution prevention activities for discharges not contaminated by industrial, commercial, oil, gas or mining wastes, there is "almost no way to see if someone is telling the truth or not" on whether a material comes in contact with stormwater, he argued.

An attorney for the stormwater reform coalition, an industry group, said the proposed program is every bit as stringent as the current one. "There's still plenty of EPA oversight in this program," said Jeffrey Longworth of Collier, Shannon, Rill & Scott in Washington. "When states can identify waters that are not meeting the goals of the act and pollutants within those waters, then they can control the dischargers of those pollutants through the permitting process," Longworth said. "To the extent that they can eliminate those

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pollutants, they can get out of the program.”

On the regulatory front, EPA has issued what it calls a direct final rule that sets permit application deadlines for Phase II of the stormwater program. It also plans to form an advisory committee to discuss Phase II issues with affected groups.

A congressional moratorium on issuing permits for Phase II discharges ended Oct. 1, 1994, which left some localities wondering whether they could be sued for not having permits. Four groups representing local governments have told EPA they feel its new regulation does not go far enough — and that legislative changes are in order.

“We cannot endorse a process that does not and cannot resolve our major problem with the stormwater management program — the requirement to meet numerical effluent limits,” said the groups, representing cities, counties, mayors and flood and stormwater agencies, in a letter to assistant administrator for water Robert Perciasepe.

By Steve Davies

runoff coming out the other end of a treatment unit to make sure it falls within an acceptable range. Most facilities have addressed effectiveness by inspecting controls to ensure they are being maintained, or by spot-checking to ensure that housekeeping practices are being implemented regularly. Monitoring results evaluated over time may indicate some degree of water quality improvement, and hence, BMP effectiveness, but this can be misleading due to differences among storms, inconsistent sampling techniques, and timing of sample collection.

Some facilities said they are frustrated by the lack of guidance from administering agencies, while others are curious to know how they compare to similar facilities in terms of compliance level, monitoring results, and other performance measurements. When asked how they would modify the program if they were the regulators, several facilities suggested simplifying the general permit and reporting requirements, and using a checklist approach where possible. Several respondents also suggested reducing requirements for smaller operations. Many regulators agree on that point.

Regulatory Perspective

To date, regulators in many states have focused on increasing the compliance rate rather than inspecting and fining non-compliers. This makes sense, since some

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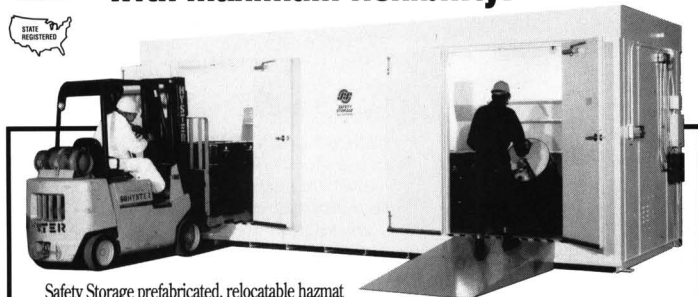
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regulators estimate compliance rates in their states of less than 50 percent. For example, the California State Water Resources Control Board has estimated a statewide compliance rate of 35 percent. Some regulators have been willing to work with industries by granting variances or exemptions, one of the more common of which is simply to give facilities more time to comply.

Some agencies have hired database managers to keep track of industrial compliance. In California, certain Regional Water Quality Boards have begun to keep lists of facilities that have filed Notices of Intent and have issued Notices of Violation for failure to file. One regional board has also begun reviewing

annual reports for completeness and will issue violations to facilities that fail to submit them. The emphasis on enforcement is likely to increase in the next few months, once regulators in other areas develop a streamlined approach to tracking.

Regulators have also begun to look to municipal stormwater programs and citizen watchdog groups to help ensure compliance. In California, the state's department of transportation is under a court order to devise a stormwater management plan — the result of a lawsuit filed by the Natural Resources Defense Council. NRDC said it was the first court decision under the 1987 stormwater amendments to the Clean Water Act and pre-

dicted the case's outcome could have national implications. NRDC has also threatened suit against several industrial facilities for failure to file Notices of Intent to comply with the regulations, and has continued to identify instances of noncompliance among industries, municipalities and other agencies.

Future of Stormwater Permitting

The stormwater regulations were originally designed as a four-tier process, with each tier becoming increasingly specific to industry sector and pollutant types. Tier One was achieved through the development of the general permit, which distinguished only between construction and all other industrial activities. The second five-year permit (beginning in 1997 in most states) may include certain industry-specific permits with minimum standards for BMPs and monitoring requirements. Parties to the group application process likely will have the option of complying with the multisector permit, which may be finalized this summer, or stick with the state or EPA general permit. Beyond Tier One, stronger — or weaker — stormwater regulation depends on what Congress decides to do.

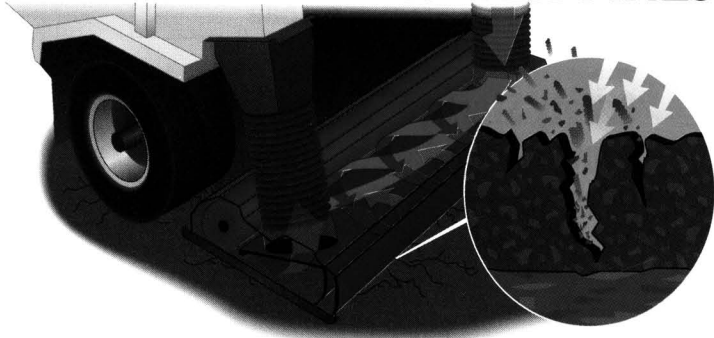
Regardless of which permit you have, a few principles apply across the board. The following suggestions may save facility managers headaches now or in the future.

- File your Notice of Intent if you haven't done so already.
- Keep your program simple: don't commit to anything in your SWPPP that you can't accomplish.
- Emphasize good housekeeping practices and source controls rather than expensive, high-maintenance treatment systems.
- File all required reports according to the schedule listed in your permit so as not to raise any red flags.
- It may be helpful to create your own checklist, including permit requirements on one side and what you are doing to address them on the other.
- Take advantage of free information sources, such as state stormwater hotlines, EPA publications, and EPA's Nonpoint Source Bulletin Board, (301) 589-0205. (Modem parameters for that board are N-8-1).
- If you are involved in a group application, watch for the new multisector permit. Be sure to obtain a copy of your state's general permit (or the EPA general permit if you are in a non-delegated state). Compare them to decide which is better suited to your needs. You can comply with either permit. **EP**

Nancy E. Gardiner and Jennifer A. Cohen specialize in stormwater quality permitting and control for CH2M Hill in the firm's Oakland and Santa Ana offices.



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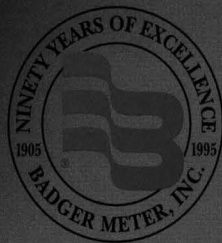
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Development of Dewees, which has 150 residences, seeks to create “no negative impact” on the native environment — a goal that extends to the island’s domestic wastewater treatment system. To that end, a discharge system was planned with a level of redundancy that would minimize the likelihood of problems stemming from capacity or mechanical failure.



An innovative wastewater treatment system uses residential 1,000-gallon septic systems to pretreat wastewater, which is then pumped to a central facility.

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An aerial, black and white photograph of a coastal wetland or estuary. A prominent, winding waterway or canal cuts through the landscape, which is characterized by various textures and patterns, likely representing different types of vegetation or soil. The sky is filled with scattered clouds, and the overall scene is captured from a high-angle perspective, looking down on the terrain.

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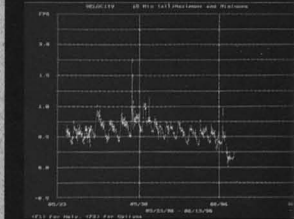
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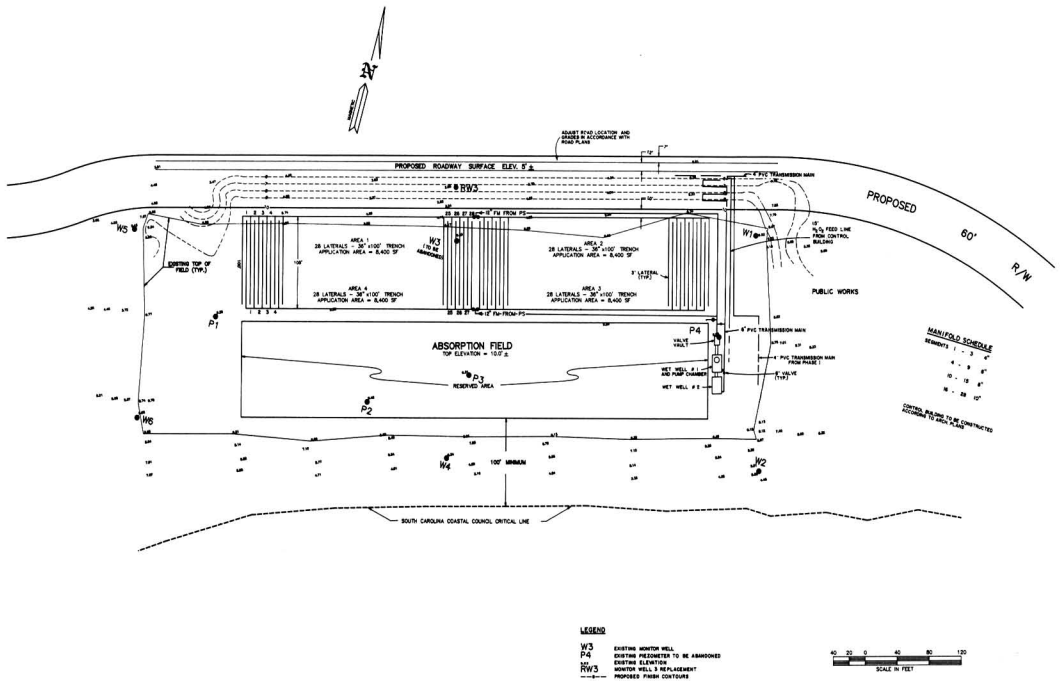
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The Dewees community has a combination of single-family permanent and second home residences with widely varying occupancy rates over the course of a year, making it virtually impossible to sustain a biological treatment plant satisfactorily.

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The treatment system for each home at Dewees Island consists of a 1,000-gallon septic tank for pre-treatment and solids reduction, two 1,000-gallon anaerobic up flow rock filters and an effluent pumping system. Production of methane gas during

*The sewer mains
are designed so that
one homesite pump
can pressurize
the entire system.*

the anaerobic treatment process required pumping system electrical equipment to be Class I, Division I as required by the National Electrical Code.

The sewer mains are designed so that one homesite pump can pressurize the entire system. Each homesite pump is equipped with an alarm to indicate pump failure.

Disinfection System

Hydrogen peroxide is a strong oxidizing agent that is very effective for odor control, especially oxidation of hydrogen sulfide

(H₂S). Disinfection with H₂O₂ requires long detention times, however. A residence time of more than four-and-a-half hours is necessary for disinfection in the system.

Liquid H₂O₂ can be delivered to Dewees Island in sealed drums and can be metered into the low pressure transmission main upstream of the pressurizing pumping station. Equipment requirements include a small metering pump, timer control system and day tank.

Pressurized Distribution

The pressurized distribution system consists of small diameter sewer mains connected to an absorption field. There are four independent disposal areas, each with 8,400 square feet. For any one day in a four-day rotation, the application rate is roughly 1.2 gpd per square foot. Gross design application rate is 0.55 gpd per square foot considering 75% of the system is at rest at any given time. The field lies below a playing field and meadow.

The absorption field is actually expected to handle up to 41,100 gallons per day, but the current flow rates at 100% occupancy

would only equal 8,900 gallons per day. The system was designed for 137 homesites occupied 365 days per year with four persons in each residence. An estimated daily flow of 200 gallons per household was used for this design, based on regional experience in coastal South Carolina – with no allowances for water conservation regulations at Dewees such as low-volume fixtures. The results to date indicate a daily flow rate of less than 65 gallons per home. If we doubled the current results, our capacity safety factor would be a factor of 12.

System Costs

The system's price tag came to roughly \$400,000, including the absorption field, storage tanks, below-ground storage, treatment facility and all mains and street lines. Each homeowner was levied a \$5,000 fee for the residential components. Monthly water and sewage rates are based on a flat rate of \$20 plus \$2 per 1,000 gallons of water use.

The efficiency of the treatment system is enhanced through composting and elimination of garbage disposals. Combined with our ban on irrigation, other than cistern supported, Dewees has reduced water use by over 70%.

The Dewees system eliminates the problem of dependence on individuals, while avoiding the potential for discharge, since the system is entirely closed. In addition, the design provides new recreation areas for human use without disturbing the island's existing habitat. As a result of designing holistically, Dewees has reduced cost for utility and consumer, enhanced treatment and achieved benefits to the aquifer and soil quality, as well as the surrounding environment and all its inhabitants. **EP**

John L. Knott, Jr. is a builder/developer specializing in planned communities and historic preservation. He currently serves as CEO and managing director for Dewees Island, S.C.

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EPM

Dechlorination Alternatives

Concern over chlorine residuals in both drinking water and wastewater is driving development of more cost-effective dechlorination systems.

By Samuel L. Bean

Chlorine has been the chemical of choice for disinfecting potable water and wastewater for decades. In spite of its popularity, there is increasing concern over how residual (free) chlorine and chlorinated compounds affect human and aquatic life. This has led to laws that tighten allowable levels of these substances in potable water before consumption and in wastewater before discharge.

Chlorine dosages often exceed the amount needed to ensure that all pathogenic organisms are destroyed, which results in a chlorine residual in the water or wastewater. Although treatment plants attempt to achieve residuals of 0.5 to 1.0 ppm, residuals can climb to many times that level through variations in the water or wastewater treated. However, even a 0.5 ppm residual can be a hazard. Studies show that chlorine concentrations as low as 0.03 ppm harm some aquatic life forms.

Some treatment facilities eliminate chlorine residuals by adding dechlorination agents just after the chlorination chamber. Sulfur dioxide is the most common because it rapidly converts total residual chlorine to chloride. But sulfur dioxide is a colorless, pungent gas that, while noncorrosive when dry, forms highly corrosive sulfurous acid in the presence of moisture. As a result, it must be handled very carefully. Workers must wear breathing apparatus when handling the chemical and plants must install leak detectors to warn of releases. The hazards associated with sulfur dioxide make transporting, handling and storing it a major health and safety issue wherever it is used.

Sulfur dioxide is stored as a pressurized, liquefied gas, so it also requires a more intricate delivery system than that of unpressurized liquids. Before use in a dechlorination process, liquefied sulfur dioxide is converted to a gas in evaporators and dissolved in water in sulfonators.

Given the capital and maintenance costs – and safety issues – associated with sulfur dioxide use, municipalities and industrial facilities have sought alternatives, but few measure up. Aeration and activated carbon are two such alternatives, but neither works as quickly as sulfur dioxide to remove chlorine. Hydrogen peroxide is also used, but it is relatively costly and poses its own handling difficulties.

New Sulfur Options

The ideal alternative would equal sulfur dioxide in dechlorination ability but avoid its safety and equipment costs. As it happens, other sulphur compounds are appearing that can be used at atmospheric pressure and are less corrosive than sulphur dioxide. Four sulfur-based salts are now commercially available for dechlorination: sodium bisulfite solution and its anhydrous form, sodium metabisulfite, as well as sodium sulfite and sodium thiosulfite (Table 1).

Sodium bisulfite (NaHSO_3), which is commercially used as a 38 percent solution, is emerging as the preferred choice because it handles easily and consistently



Conventional methods for dechlorinating drinking water and wastewater, including using of sulfur dioxide (pictured in storage tanks outside a wastewater facility) are giving way to safer and more economical alternatives.

TABLE 1

Sulfur-Based Chemicals Used in Dechlorination

Parts needed per part of chlorine removed*

Chemical	Formula	pH 4.0	pH 6.5	pH 9.0	pH 11.0
Sodium bisulfite	NaHSO ₃	1.61	1.61	1.61	1.61
Sodium metabisulfite	Na ₂ S ₂ O ₅	1.47	1.47	1.47	1.47
Sodium sulfite	Na ₂ SO ₃	1.96	1.96	1.96	1.96
Sodium thiosulfate	Na ₂ S ₂ O ₃	2.67	2.23	1.60	1.00

*These values are 10 percent above the theoretical level needed for dechlorination.

reduces chlorine over the entire pH range. It reacts almost instantaneously with free chlorine, using 1.465 parts of sodium bisulfite to remove one part of chlorine. In actual use, the typical dose is 10 percent above the theoretical level so 1.61 pounds of sodium bisulfite is used to dechlorinate one pound of chlorine in water.

Sodium bisulfite does not vaporize into a toxic gas like sulfur dioxide, making it safer to transport, store and handle, especially in populated areas. One person wearing safety equipment appropriate for mildly corrosive materials can unload a shipment of the chemical. Liquefied sulfur dioxide, in contrast, requires a two-man crew dressed in rubberized suits and equipped with breathing packs.

Sodium bisulfite is best used with good process controls to monitor bisulfite addition precisely, to balance the amount used to eliminate chlorine residual. Any excess sodium bisulfite reacts with oxygen in the water to form harmless sulfates.

Ease of Use

One wastewater treatment plant set up its sodium bisulfite operation in the following manner. The plant stores sodium bisulfite in three 10,000-gallon storage tanks and pumps the liquid at 70 gpm through Schedule 80 PVC piping in an underground pipe gallery to a 3,500-gallon day tank. Transfer pumps automatically refill the day tank when the level inside falls to three feet.

The bisulfite is metered into the far end of the chlorination chamber through a magnetic flow meter and fed into the water stream with either a 5-gpm pump for low-flow conditions or a 25-gpm pump for high-flow conditions. Mixers at the addition point ensure good contact between the bisulfite and water. The chlorine content of the effluent is measured 30 feet from the point of sodium bisulfite injection.

The switch from sulfur dioxide to sodium bisulfite saved one water treatment plant more than \$150,000 per year in energy costs alone, due to elimination of its sulfur dioxide evaporator. Eliminating maintenance and operating activities associated with pressurized storage and piping, sulfonators and related equipment added significantly to the savings.

Sodium bisulfite, an aqueous solution, offers compelling safety and plant operating benefits that make plants simpler and less costly to operate. **EP**

Samuel L. Bean is manager of technology development at General Chemical Corp., based in Claymont, Del.

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USING SILICATES TO CONTROL LEAD IN DRINKING WATER

By Pat Delaney

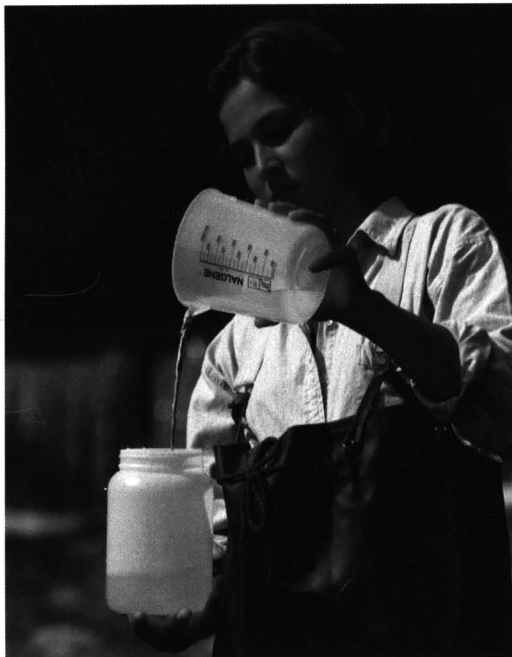
Minimizing lead in drinking water has become a top priority for public health officials. But in areas where drinking waters are acidic and/or exhibit low hardness, their corrosive effects can result in elevated lead levels. This phenomenon occurs not only in the Northwest, Northeast and parts of the Southeast, where acidic waters are found, but in other areas that contain large numbers of lead service lines and lead/tin solder in pipe fittings.

Silicate corrosion inhibitors are one among many options available for preventing lead from leaching into drinking water. A recognized treatment method under EPA's Lead and Copper Rule, silicates do not contribute any taste or odors to water and can be used not only for lead reduction, but also to reduce copper levels or to solve a red water problem.

Evaluating Treatment, Goals

Determining your drinking water quality goals is the first step in evaluating the need for corrosion control and the proper corrosion control method for your system. Because each water system has different characteristics and different contaminants, you will probably have to develop a water corrosion treatment finely tailored to your needs. Treating drinking water problems is admittedly more an art than a science.

Many medium and small communities have discovered the benefits of sodium silicates in controlling lead content. In its most common form, the chemical is nonhazardous and can be used on a wide



Using Silicates

variety of surfaces, including cast iron, steel, copper and lead.

However, sodium silicates are not the answer for every system. In certain types of water, there are more economical alternatives to limit corrosion, such as orthophosphate or lime and CO₂.

Examine Your Costs

In looking at the benefits of other chemical options, you need to consider your overall treatment operation. Currently, for example, orthophosphate are considered the best available technology for corrosion inhibition of lead surfaces, primarily because they test well under EPA's laboratory conditions. However, phosphates only work well in a narrow pH range (7.2 to 7.8). If the pH falls outside this range, it needs to be adjusted using other additives. The cost of pH control can be an important factor in the total cost of corrosion control treatment.

Likewise, if your corrosion control addi-

tives increase zinc or phosphate levels substantially, these may have to be treated or removed at the wastewater plant. Those treatment costs should also be included. You may find that expenses are less by simply using a silicate.

You also need to consider long-term costs. For example, by using a silicate corrosion inhibitor, you can lengthen the life of system pipes. If the cost of installing new pipes would be more than the cost of a corrosion inhibitor like sodium silicates, using silicates becomes a cost-effective alternative. Studies have found that silicate treatment may also reduce the breakdown of asbestos-cement surfaces, prolonging the life of the material while minimizing the release of fibril asbestos.

Monitoring Silicate Use

If silicates are selected as the best course of action to address lead contamination, it is best to review a system's temperature, flow rate, age and type of pipes (e.g., un-

lined/cast iron), water pH and alkalinity.

Velocity or flow rate plays an important part in determining the amount of silicates needed, because the amount in contact with pipe surfaces increases with flow rate. Seasonal variations in flow rates should be considered in terms of the impact this will have on your treatment.

To more accurately monitor treatment effectiveness on a distribution system, some municipalities use a pipe-loop, or laboratory reproduction of the actual system. Pipe-loop studies should be based on U.S. Army Construction Engineering Research Laboratory and/or American Water Works Association Research Foundation procedures.

Coupon tests are another option. Coupons are pieces of metal submerged in water to monitor the corrosion effects; they can be pieces of lead, copper, steel or any other metal. Because it's less expensive than other tests, small communities frequently use this test.

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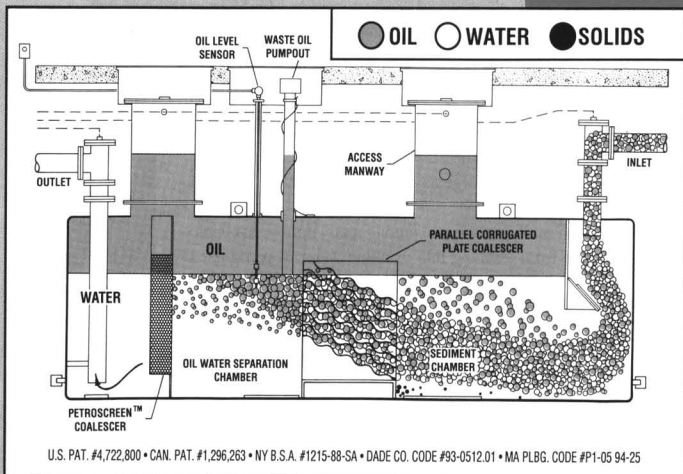
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Using Silicates

Conducting a Field Study

A field study may be the most important means of evaluating your silicate treatment program. Since the amount of corrosion may vary, you must select numerous sites, including locations at the center and both ends of the distribution system, as well as the water treatment facility itself. It's also important to know if the inhibitor has developed a film throughout the system.

You should follow these basic steps in setting up your sampling program:

- Know your annual cycles of water flow and temperature through the distribution system. These key characteristics may determine the length of time monitoring must take place.

- Generally, three samples should be taken from each monitoring station on the same day within a determined amount of time.

- First-draw samples should be collected from taps from designated sites along the water system. Allow the water to stand for 6-12 hrs before sampling.

- Second-draw samples should be collected after the tap has been flushed for five minutes.

- Third-draw samples should be collected immediately after the second sample and analyzed for pH and alkalinity.

Remember that, for consistent results, data must be analyzed in a laboratory. Data analyses are also susceptible to bias in the calculated mean.

Therefore, sets of lead data from every sampling site should be subjected to the Dixon test to eliminate inaccurate tests. All the laboratory findings must be compiled to determine if the water quality has improved over the time period in which the testing and constant water treatment took place.

Dosages

In order to quickly establish the protective film, silicate treatment requires a passivation dose of 20 to 24 mg SiO₂/L during the first 30-60 days of treatment. After the protective film has been established, it can be maintained with smaller additions of silicate. In most cases a maintenance dosage of 10 mg SiO₂/L is effective. Lesser dosages may be effective, but the recommended minimum maintenance dosage is 4 mg SiO₂/L. **EP**

Pat Delaney has worked with silicates for more than 16 years. He currently serves as a technical sales specialist with the PQ Corp., which is based in Valley Forge, Pennsylvania.

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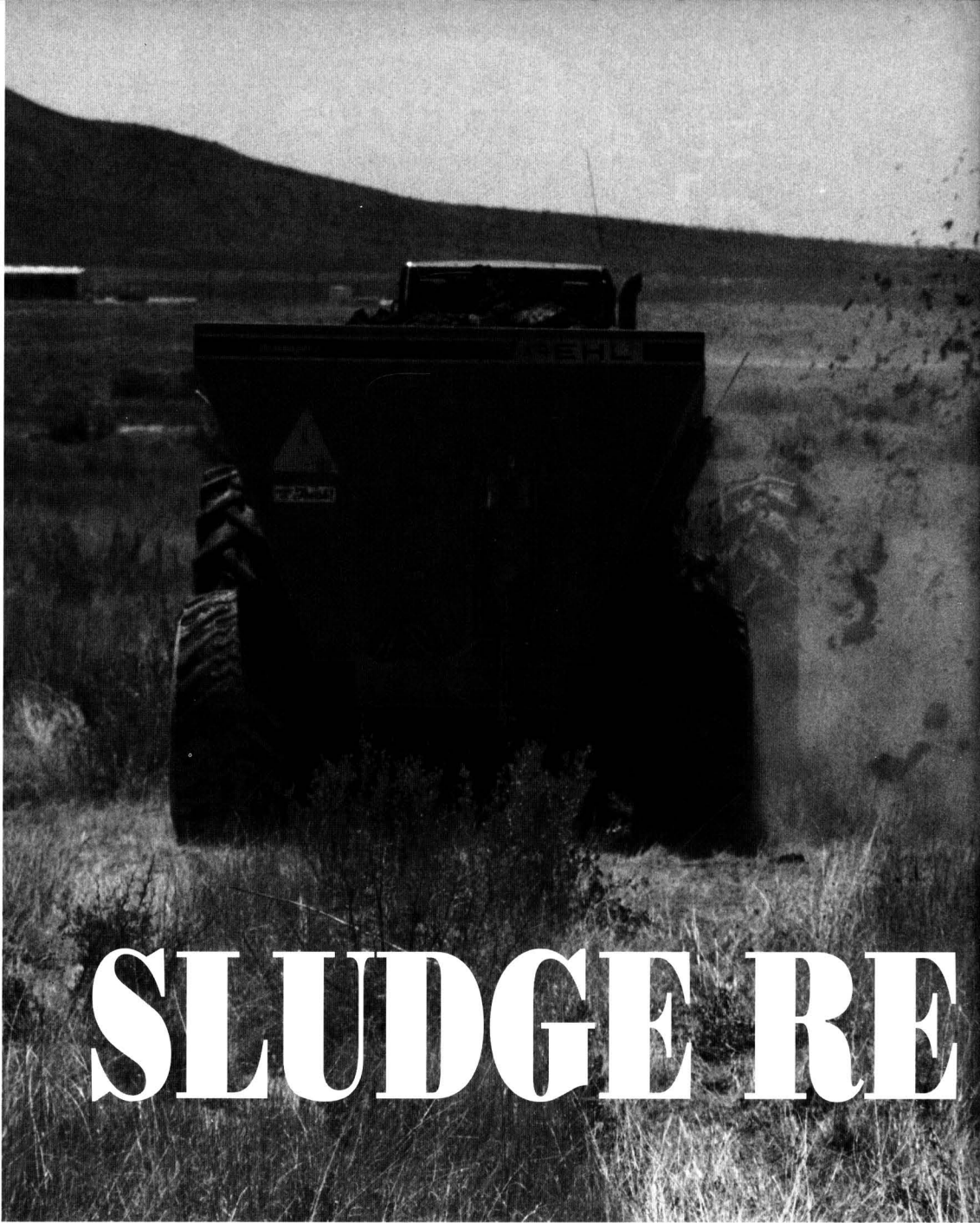
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SLUDGE RE

Texas Rangeland Profits from NYC Biosolids

By Bob Carlile



USE

A land application project on West Texas rangeland is among the largest sludge reuse projects undertaken since EPA passed its Part 503 reuse regulations.

What has become one of the largest sludge reuse projects to date started out as one of the unlikely scenarios: the notion of dumping New York City sludge on the proud state of Texas. In addition to a July, 1992 ban on ocean dumping of sewage sludge, New York City faced a consent order that required at least 50 percent of their biosolids to be beneficially reused — effectively eliminated landfilling and incineration as viable options for half their sludge.

A consortium of three private contractors, all of which had been involved in some aspect of New York City's sludge management program, assembled to find a solution to the city's quandary.

The consortium, Merco Joint Venture, won a city contract to handle up to 700 tons per day of biosolids for beneficial land application.

An initial reuse project targeted Thomas, Oklahoma, where more than 20,000 acres of

private farm and pasture land was registered by local land owners for biosolids application. In November 1992, after months of heated deliberation, the Oklahoma Department of Health ruled that a transfer station permit would be required, which would delay the project for up to two years. This effectively killed the application, and Merco began the search for a contiguous piece of property where unloading and land application could take place.

“Ideal” Site

The search ended at Sierra Blanca Ranch — 128,000 acres of land adjoining the main east-west route of Southern Pacific Railroad. The ranch, near the far West Texas town of Sierra Blanca (in Hudspeith County) had been in receivership for several years, and appeared ideally suited for the project. A package was submitted for registering the site in accordance with the Texas Department of Health and the Texas Water Commission.

Because of the fast-approaching ocean dumping deadline, Merco urged speedy approval of the project. The Texas Water Commission obliged, and rail cars with New York City biosolids began heading west to Texas in July, 1992. A legal challenge led by the state attorney general ensued, but a federal court denied the petition and land application of biosolids began in earnest.

Since the Merco partners were new to the science of land application, they contracted with a Texas firm, CDR Environmental, to manage the operation. CDR had years of experience in land application of biosolids in the Houston area.

Compared with biosolids application projects in other states, especially those on the Eastern and Southeastern seaboard where landfill space is a premium, the Sierra Blanca site provides an ideal site. Problems such as odors, aesthetics, groundwater and surface water concerns and biosolids storage were no longer an issue. Nor were the headaches associated with multiple landowners.

Environmental Impacts

Once loaded in containers, sealed, and placed on rail cars in New York, the containers of treated biosolids never see public roads again. The seals are not broken until the containers are on a private rail siding at

Remote Dredge Pulls Sludge from Lagoons

Officials with the Los Alisos Water District water reclamation plant in California have hit upon a novel system for removing and disposing sludge.

The wastewater treatment facility siphons wet sludge from its treatment lagoons with a remote-controlled lagoon dredging system. Called the “Pit Hog,” the dredge uses an eight-foot auger cutter head to remove sludge from the bottom of the lagoon. A high-capacity submersible cast-iron solids handling pump moves the sludge through a flexible line for on-shore collection. An electric motor coupled to a hydraulic piston pump drives the pump and auger.

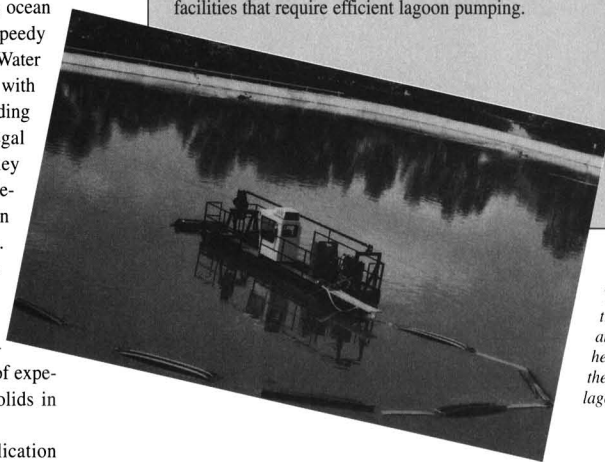
An on-shore traversing winch system provides both longitudinal and lateral movement of the dredge, using a master remote control panel.

The system, developed by Liquid Waste Technology of Somerset, Wisc., pumps an average of 25,000 gallons per day of wet sludge from the treatment lagoon. One pass of the dredge fills the 12,000 gallon holding tank on shore.

Los Alios’ existing lagoon system consists of five treatment cells, operating in series, with depths ranging from 18 to 30 feet. The first two are mix/aeration lagoons, and the others are partial mix lagoons where the majority of suspended solids settle out. The percentage of total solids pumped increases dramatically with depth. Solids pumped to shore by the dredge are fed to a filter press for dewatering.

The floating dredges have also been used on automated sludge removal systems at power plants, petroleum refineries and other commercial and municipal facilities that require efficient lagoon pumping.

— By Beth Cahape



The “Pit Hog,” remote-controlled floating dredge uses an eight-foot auger cutter head to remove sludge from the bottom of solids separation lagoons.

Sierra Blanca Ranch, 10 to 12 days later.

At that point, the containers are randomly sampled, then transferred to haul trucks and delivered some eight to 15 miles to the middle of the ranch for application. The biosolids are deposited in designated marshalling areas, loaded into agricultural manure spreaders and applied to the grasslands at a rate of three dry tons per acre or less. The application area has been surveyed into 40-acre grids, and each container is tracked by computer within the application area.

One key environmental concern, surface water runoff, is hardly a factor at the site

due to the low rainfall, high soil infiltration rates, and the presence of runoff containment ponds in all major drainage areas. Even during the relatively wet year of 1993, the catchment ponds were never over 30 percent full.

Groundwater contamination, yet another potential problem, is not even an issue at the site, due to the great depth of groundwater (over 800 feet) and minimal rainfall seepage beyond roughly three feet of soil.

In nearly three years of operation, applications have been curtailed a total of five days due to inclement weather. Even though a 30-day storage facility was built

on-site, it has been used only once since the project began.

Research Backs Benefits

Experience by other states in land-applying biosolids in dry climates has proven it a beneficial reuse application. Studies over the past 12 years show that rangeland productivity can be increased two- to three-fold, improving forage quality and rainfall absorption and reducing runoff. The same studies concluded that ground cover and organic matter generated by an enriched soil reduces the potential for wind erosion.

And Texas Tech University, under an extensive six-year research grant at Sierra Blanca Ranch, has found these same benefits under arid Texas conditions. Some two dozen research scientists and students have been monitoring the effects of biosolids on soil, vegetation and water quality at the site. After evaluating over two thousand test plots, their research shows that biosolids increased grass production by at least 50 percent after just the first year's application. Even at test rates up to 40 tons per acre, vegetation showed no changes in heavy metal or nitrate content.

Soil tests at the site indicate that natural background lead levels in the soil amount to about 24 lbs. per acre in the top two inches of soil, while annual application of biosolids amounts to 1.7 lbs. of lead per acre.

Texas A&M University scientists are conducting two air quality studies at the ranch, looking at both particulate movement and microbial movement in the atmosphere. The first-year results show that applying biosolids to desert rangeland reduces wind erosion and particulate movement in the atmosphere by roughening the surface, increasing organic matter, and promoting grass production, height and density. Overall amounts of windborne mineral and organic material are almost too small to measure. The arid conditions at the site also hinder survival of microbial pathogens, both in the surface-applied biosolids and in airborne particulates.

Economic Success

Thanks to the New York City biosolids project, Sierra Blanca is now a thriving community. Fifty local citizens are employed on the project, with an annual payroll of more than one million dollars.

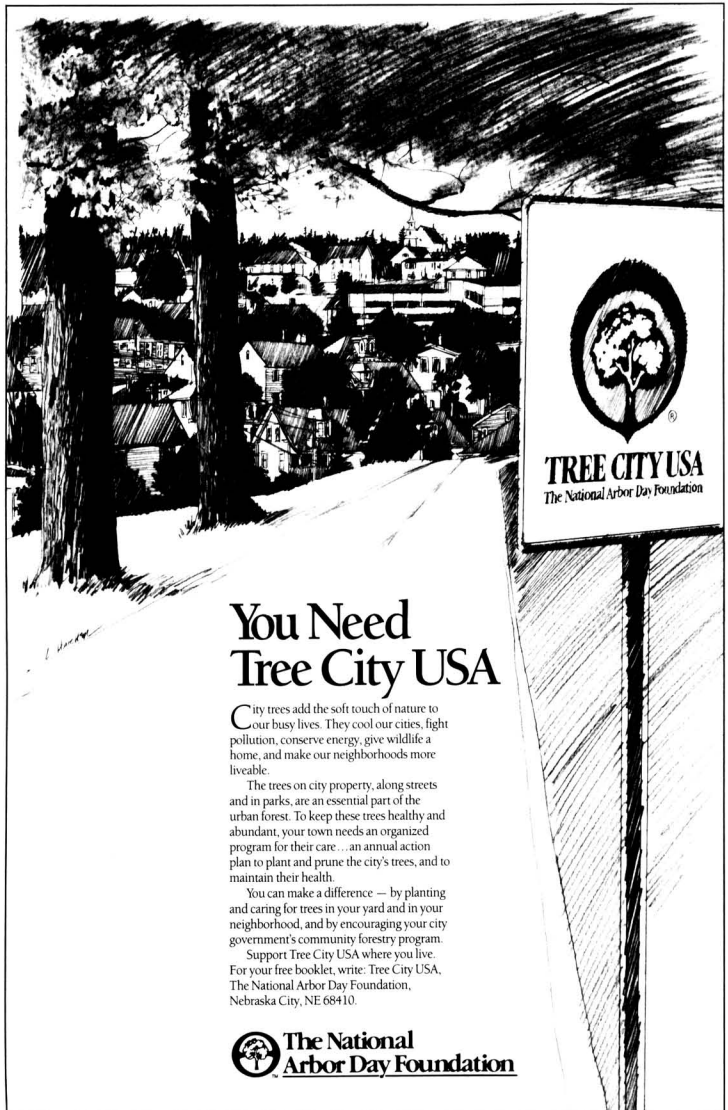
Millions of New York dollars have been invested in Texas through this project, in-

*Some two dozen
research scientists and
students have been
monitoring the effects
of biosolids on soil,
vegetation and water
quality at the site.*

cluding rail transportation, state and local taxes and fees, and the expenses of operations, regulatory compliance and litigation.

Add to this the benefits of revitalizing 18,000 acres of depleted Texas rangeland. The project is a one-way economic street for the citizens of Texas and Hudspeth County. **EP**

B. L. Carlile, Ph.D., P.E., is an environmental engineer and soil scientist. He currently serves as environmental consultant and scientific director of the Sierra Blanca Ranch project.



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EPA's Building Air Quality Alliance: Should You Join ?

*EPA Indoor Air Chief Bob Axelrad
fields ten questions on the goals of the agency's
latest voluntary performance program.*





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EPA is gearing up to launch a new voluntary program, the Building Air Quality Alliance, which would require members to implement a series of steps to improve indoor air quality. The program, to be unveiled next month, targets commercial building owners and landlords. EP senior editor Steve Davies recently talked with Bob Axelrad, head of EPA's Indoor Air division, about the program's goals – as well as concerns of its critics.

EP: Could you describe the backdrop for the alliance — its origins, when and why EPA decided to start it?

It's basically the second phase of a major effort to try to provide voluntary guidance to building owners and managers on how to prevent and solve IAQ problems in commercial office space. It is designed to take guidance we developed in 1991 with the National Institute of Occupational Safety and Health and actually

implement it through real indoor air quality (IAQ) management programs.

It's hard to say where the idea originated. We had outside groups saying, "Hey, it would be good if we get some incentives to do this. It's the right approach but how can we get people to do it?" Through talking with a lot of different organizations, and internal discussions, we just decided to start a process to establish a voluntary program.

We pulled together as many organizations as we could identify that had a stake in this: occupant representatives in the form of unions, groups that represent health and environmental concerns, all the way through the professional and trade groups and up into product manufacturers. We brought them together in February of last year and worked with them for the better part of a year on developing actions that would be reasonable for building owners and managers to take in exchange for recognition from EPA for having performed well on the indoor air front. During the course of this we worked out a series of actions, a subset of which are contained

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Building Air Quality Alliance's Critics, EPA Square Off

EPA's Building Air Quality Alliance program appears to have everything even the most anti-regulatory business could want. It's voluntary, it's small (compared to most EPA programs), and it was designed by businesses and government working together.

But some small business groups don't like the idea, calling it a "backdoor" attempt to regulate indoor air quality that duplicates OSHA's proposed indoor air standards. The groups, which include the National Licensed Beverage Association (NLBA), National Federation of Independent Business, Printing Industries of America and others, say Congress should cut funding for this unauthorized program.

EPA officials, the Building Owners and Managers Association, and an indoor air consultant who has worked closely with the agency on the program disagree sharply with that assessment. They say the alliance is completely voluntary — and that there has been plenty of opportunity for public comment. Noted an OSHA spokeswoman, "How this can be seen as duplicative when there isn't any rule and no guarantee that there will be one."

"We just think it's absolutely outrageous," countered John Chwat of Washington's Chwat and Co., which is representing the NLBA. Groups opposing the program represent sports bars, restaurants, liquor stores, and bowling alleys, among other businesses.

Chwat said businesses with a vested interest in the program — indoor air consultants and heating, ventilation and air conditioning companies, for example — helped EPA write the proposal. EPA officials "never sought to network with people who would be affected," he said.

Chwat has taken the opponents' case to congressional appropriators in an attempt to restrict the program's \$405,000 outlay for fiscal 1995, which ends Sept. 30.

EPA officials don't mince words in responding to the program's critics. "Many of these groups are really quite misinformed," said Bob Axelrad, head of EPA's Indoor Air Division. He characterized the opponents as "basically bar owners who have lately been joined by the restaurant association and some other groups. And we think they represent a very small minority of business interests out there, most of whom are very supportive of this program."

Jack Halliwell, president of Halliwell Engineering in Providence, R.I., said the program "makes a lot of sense. As a voluntary program, it's going to be market-driven." Halliwell worked with EPA officials and other businesses and trade groups to develop the program.

—By Steve Davies



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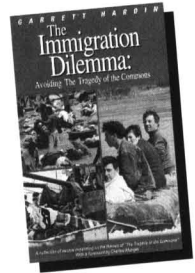
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continued from page 37

in the action plan for the alliance.

We have targeted this toward building owners and managers rather than toward corporations because we recognize that indoor air is sort of a new issue. It's not quite as clear as "Green Lights" [an EPA program encouraging energy conservation] or some of these other [voluntary] programs in terms of our ability to really give people a clear idea of the costs and paybacks. So, we are asking people who own or operate buildings to enlist individual buildings and not necessarily commit to entering their entire building stock into the program.

The second tier of this program is the alliance itself, which is really a loose confederation of organizations that have signed a memorandum of understanding with EPA simply endorsing the program and agreeing to promote the principles and the action plan to prospective partners.

EP: Where does the authority for the program specifically come from?

We have a broad authority under the Superfund Amendments and Reauthorization Act of 1986, basically two pages which say, "Do research on IAQ and disseminate information."

"Whether or not they chose to become official partners [building owners], found going through the process an incredibly educational experience."

EP: And you feel that extends to the alliance program?

If this were a set of guidelines or standards we probably would not have authority to do this, but from our perspective this is as much or more education as it is standards. What we are doing is providing information to a wide range of players, which they may or may not make use of. In fact, one of the things we learned in testing alliance materials with building owners and managers was that whether or not they chose to become official partners, they found going through the process an incredibly educational experience. They learned all kinds of things about ways of doing things better that they will make use of whether or not they decide to go all the way to full partnership.

EP: Are you still on track to start the program in June?

We hope so. The issue really comes down to when we get clearance from the Office of Management and Budget on the application package. We expect to hear from them in May. But a lot of this depends on some things which are not necessarily in our control, like the OMB review and our new-found, shall we say, concerned organizations out there, which have come late to the process and have decided not to participate but to simply go around it and attempt to stop the alliance – without any discussion about its concerns or ways

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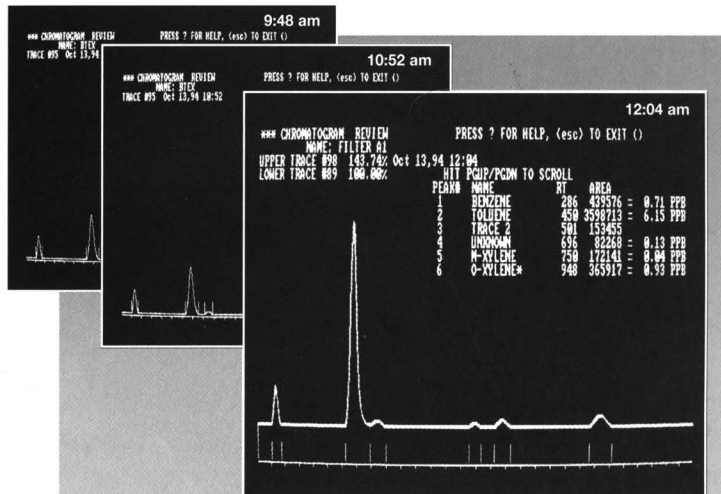
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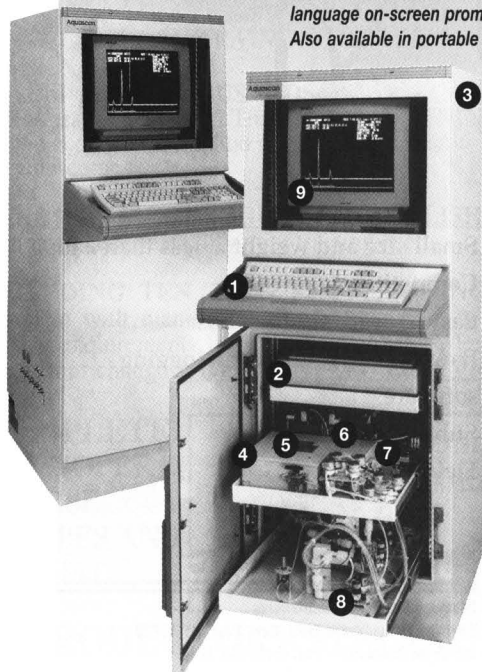
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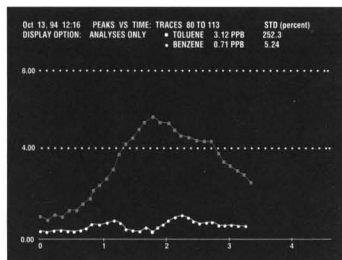
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to try to alleviate those concerns. These are the small business groups that all of a sudden have begun a campaign to basically stop the alliance before it begins (see sidebar, this page.)

EP: Why should a building join this program?

The expectation is that completing the actions in the action plan should directly affect occupants' health and productivity. It should also decrease operating costs through improved efficiency of their HVAC system. But there are other benefits – including being recognized as a leader in the field by addressing indoor air quality problems in a proactive way rather than in a reactive mode. There's also some support that is offered from the alliance in terms of guidance and training opportunities. Certainly there's potential for buildings in the program to market their space as addressing not just the basics of providing a safe environment for employees but also one that has taken indoor air quality to heart.

*Our goal
is to have buildings
really do a thorough job of this,
not to pay lip service*

EP: Are company headquarters among your targets?

We're not targeting leased space per se, we're targeting office space primarily, and that would include corporate office space, corporate headquarters. We expect we'll have a lot of corporate involvement in this but not necessarily corporation-wide commitment, at least initially.

The hope is we'll get enough groups to participate in this that people will see it really amounts to good practice, not an onerous set of requirements.

These are things which not only make sense from an indoor air perspective but from an energy perspective as well, and we'll start to broaden the application of the principles to more and more of their buildings.

EP: You've said that after about three years you expect to have 275 buildings. How many staff people at EPA will you need to run it and how much will it cost? How big will the program eventually get?

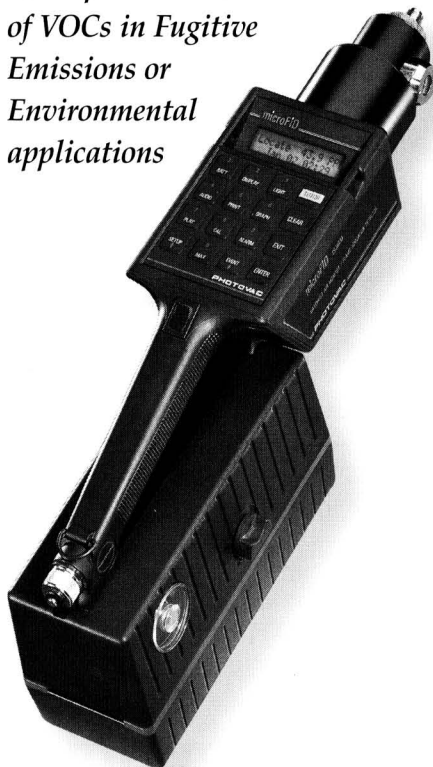
In this day and age I don't expect we're going to get significant new resources for the program, and that poses somewhat of a dilemma for us. Right now we have three people and we're budgeting \$500,000 a year. Our expectation is it's not going to get a heck of a lot bigger than that unless there's a huge demand for it and someone gives us additional resources to do it. We're not expecting it to become like Green Lights or Energy Star or any of those other programs. We're going to stress quality, not quantity. Our goal is to have buildings really do a thorough job of this, not to pay lip service to the job of implementing the actions.

continued on page 43

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Improved Health, Marketability Could Result From Becoming Building Partner

What are the benefits for the building owner who becomes a Building Air Quality Alliance building partner? Not just potential improvements in health and productivity for building occupants, but decreased operating costs and possible marketing advantages, EPA says.

Not to mention public relations points. Building partners can advertise their participation in the alliance in marketing materials, internal

newsletters, on letterhead and within the building itself. But they must follow strict guidelines for advertising their participation, the agency warns.

EPA estimates that the reporting and recordkeeping necessary for the program would total 86 hours per year. A list of steps for prospective building partners includes the following:

Step 1 • Designate an IAQ manager.

Step 2 • Develop an IAQ profile of your building
• Identify and review existing records
• Conduct a walkthrough to assess current IAQ situation

Step 3 • Address exiting and potential IAQ problems.

Step 4 • Educate building personnel about IAQ.

Step 5 • Develop and implement a plan for facility operations and maintenance.

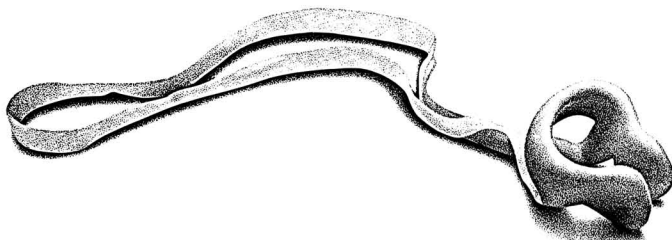
Step 6 Manage potential indoor pollutant sources, including:

- remodeling and renovation
- smoking (Institute a smoking policy that prohibits smoking or provides direct exhaust and adequate ventilation to areas where smoking is permitted)
- housekeeping
- pest control
- shipping and receiving

Step 7 • Communicate with tenants and occupants about their role in maintaining good IAQ.

Step 8 • Establish procedures for responding to IAQ complaints.

Sources: Building Air Quality Alliance Participants Manual, Federal Register, March 1.



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continued from page 41

The idea is to do some good case studies, to learn ourselves how the economics will play out better than we know now. We have some decent estimates, but we need to make sure they're realistic. Although they were put together with a lot of help from real live building managers, we would like to be able to show not just what it costs, but also to quantify some of the benefits for building owners so they can get some idea of the value of this.

EP: Is there a typical size building that you'd be looking for?

No. I think it's going to run from relatively very small buildings to perhaps some very large ones.

EP: Critics of the alliance say it overlaps with the OSHA rule-making. Why do you feel they're complementary?

There is no OSHA rule, to be clear. Most interestingly, these people criticizing the alliance as overlapping with OSHA are also diehard critics of OSHA. These people don't want to see indoor air become an issue for them. They have stridently opposed OSHA and now they're opposing the alliance. Their reasoning is simply faulty. The fact is, OSHA and EPA both strongly support the concept of voluntary actions to improve indoor air quality. OSHA, however, also has a regulatory authority which they are bound to implement and which they are in the process of trying to implement, but that process is a lengthy one.

They have been involved with us in developing the alliance, and we have been involved with them in developing their rule-making. Despite what some on the outside may believe, no one in government is interested in unnecessary duplication, overlap or needless regulatory requirements, and while we are attempting to get IAQ practices implemented on a voluntary basis, technically what we are recommending and what OSHA had proposed are very consistent.

If and when OSHA finalizes a rule, there would be potential for overlap at that time. If there is any role for the alliance when they finalize it, it will certainly be a very consistent role. It is quite possible there will be no role for the alliance, and I would be the first person to critically look at the program and say, "Is this necessary"? It isn't going to be one of those government programs that exists simply to continue its existence.

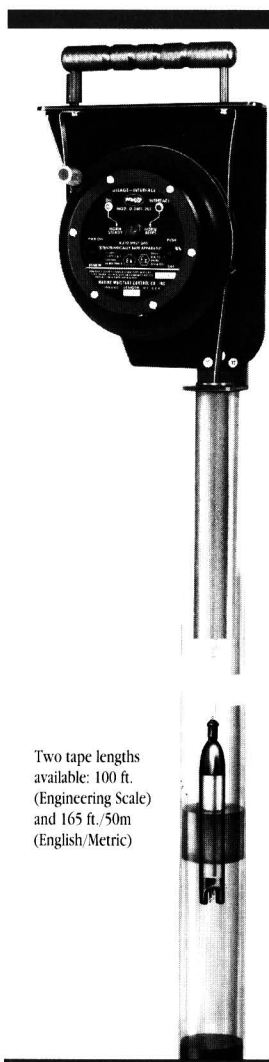
EP: Concerning productivity

losses, EPA materials on the alliance cited a couple of studies. What role do they play in the program?

Unfortunately, no one has really figured out how to study productivity in relationship to IAQ effectively. What we have at the moment are a number of studies that are rather uncertain in their ability to really predict productivity gains or losses from IAQ. It is a fairly rough science. The problem is there are so many variables that go into an individual's productivity that it's very difficult to con-

struct a study where you're able to isolate the IAQ variable from everything else.

Much of this is really difficult to document scientifically, but everyone believes there is a very high productivity loss associated with indoor air. We did do some pretty detailed analysis for a report to Congress in 1989, and while we were not prepared to put a single dollar figure on the cost to society of productivity, we did estimate that IAQ did cost society in the tens of billions of dollars per year in terms of both direct medical costs and productivity, the bulk of it being productivity issues. **EP**



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New Rules

Two separate proposed regulations expected this coming summer respond to long-voiced concerns

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Changes Ahead for Hazardous Waste Disposal

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By Eli Eilbott

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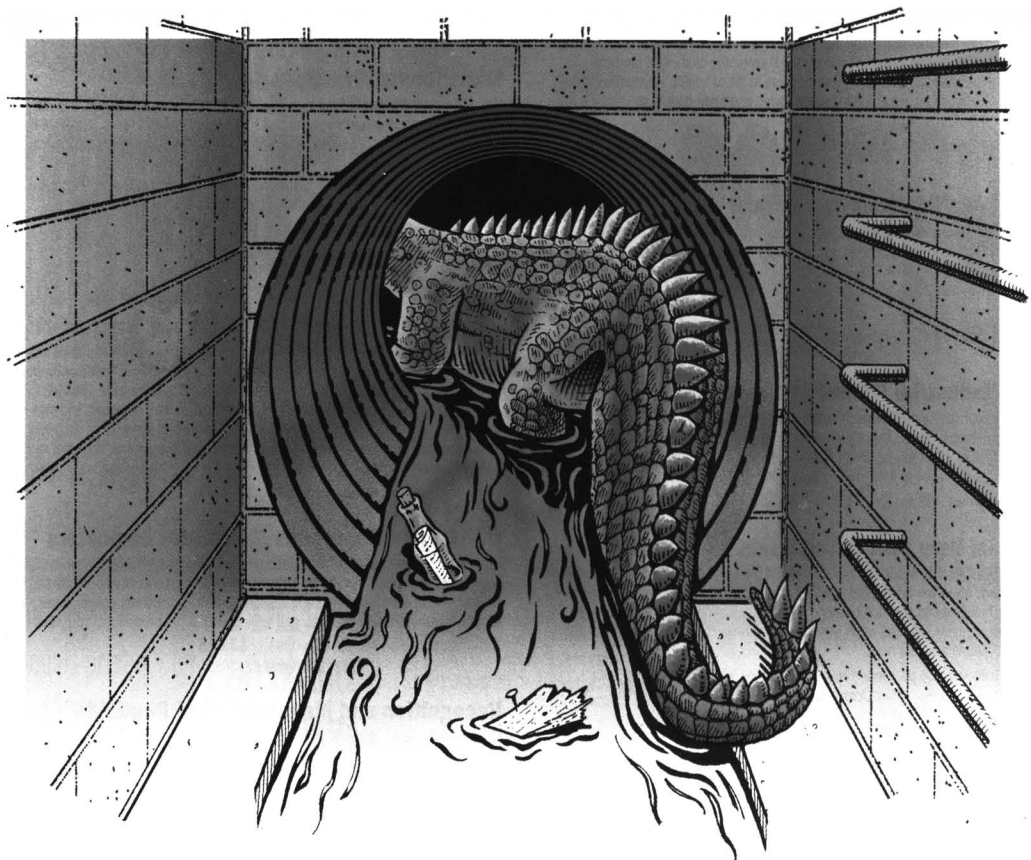
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continued from page 44

that certain low-risk wastes are excessively regulated under EPA's hazardous waste management scheme. The Hazardous Waste Identification Rule for "process" wastes aims to make it easier for waste generators to avoid hazardous waste controls wastes. The HWIR for Contaminated Media sets new criteria for cleanup of soil and groundwater contaminated with hazardous wastes with the hope of simplifying and expediting site cleanups.

Of course, getting all sides to agree on the need to accomplish these goals is the easy part. What has proved far more challenging (and so far unattainable) is reaching consensus on how to achieve them in a manner that assures continued protection of public health and the environment.

HWIR for Process Wastes

Under the HWIR for Process Wastes, EPA is expected to establish "exit" levels below which any newly-generated waste currently regulated as hazardous could be treated, disposed of or otherwise managed

without hazardous waste controls. These chemical-specific exit levels will likely be based upon risk assessment of the health, and to a lesser extent, ecological threats posed by exposure to different chemicals.

In the past, EPA has focused exclusively

*Getting all sides
to agree on the need
to accomplish these goals
is the easy part.*

on the potential for contamination of groundwater resulting from deregulation of particular hazardous wastes. Significantly, the HWIR for Process Waste will mark the first time EPA has taken a comprehensive, "multiple pathway" approach that aims to evaluate all relevant exposure pathways of hazardous wastes, including ingestion of

contaminated soil, dermal contact, inhalation of airborne contaminants and ingestion of contaminated drinking water. Such an evaluation is necessary given that generators would be free to dispose of HWIR-listed process wastes under an unpredictable range of circumstances.

Certain groups, however, have voiced deep misgivings with the Agency's apparent willingness to rely on a new and unproven methodology as the basis for deregulating hazardous wastes. Risk assessment is as much art as science, and involves application of subjective assumptions to highly complex computer modelling equations. Depending on how the rule is worded, environmental and waste management organizations and even some state-level regulators may raise concerns over the proposal.

Another controversial issue centers on preliminary indications that HWIR decisions will be both self-implementing and immediately effective. Whereas today, a listed hazardous waste may be deregulated only following a rigorous "delisting"

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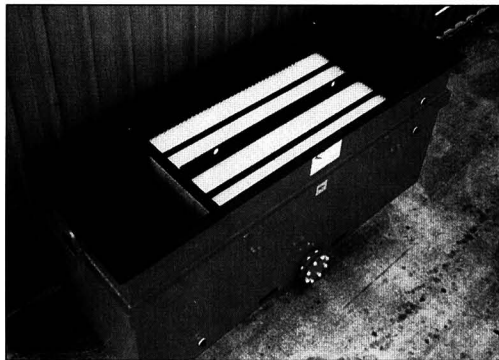
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process – including a public comment period – the HWIR for Process Wastes could cut EPA, the states and the public out of that process. Waste generators may be authorized to declare on their own that their wastes are no longer hazardous and immediately begin managing such wastes as non-hazardous. Support for the self-implementing approach has its roots in widespread dissatisfaction with the time-consuming, resource intensive delisting process.

A possible check on exit decisions might be a required waiting period of 60 days be-

History has shown that the existence of widely varying state standards can create incentives to dispose of wastes in states with the least regulated (read cheapest) facilities.

fore a generator could manage a waste as nonhazardous. Such a waiting period would not compel government scrutiny of the generator's decision, but would certainly provide an opportunity for review at the agency's discretion.

HWIR for Contaminated Media

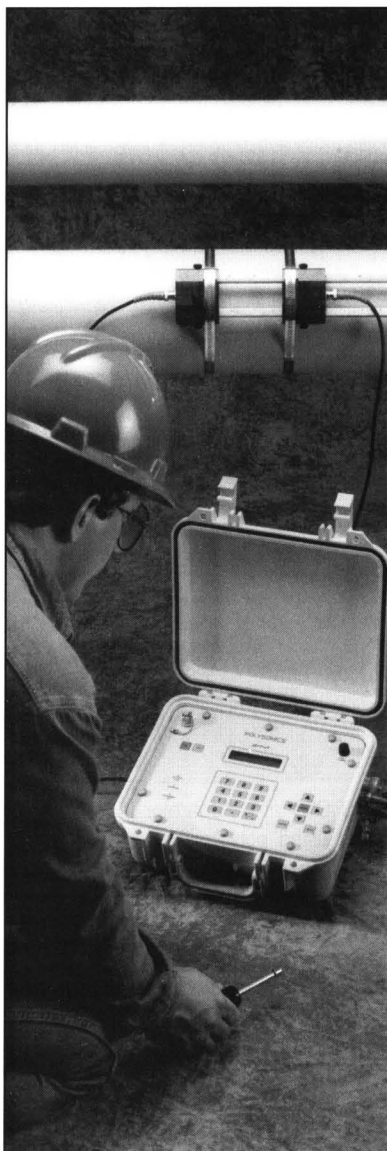
Under the HWIR for Contaminated Media, EPA is expected to propose a "hot spot" approach to cleaning up sites contaminated with hazardous wastes. Specifically, media such as soil containing hazardous compounds above a "bright line" concentration level definition for certain toxins would be managed in accordance with modified hazardous waste requirements. By contrast, there would be no mandatory hazardous waste regulation for media contaminated with hazardous wastes below the bright line. Further, states would be authorized – but not required – to impose certain hazardous waste controls on contaminated media below the bright line on a site-specific basis.

EPA's intent is to provide the states with flexibility to ease regulatory requirements on media contaminated with low levels of hazardous wastes. Thus, contaminated media shown to fall below the bright line could, without explicit state instructions to the contrary, be disposed of as nonhazardous waste.

As with the HWIR for Process Wastes, the contaminated media proposal is not without controversy. A key concern is that the bright line may be set too high – allowing moderate to high-risk wastes to escape minimum Subtitle C controls. It is anticipated, for example, that the bright-line levels will be orders of magnitude higher than the process waste exit levels.

In addition, with no minimum Federal guidelines applicable to the management of media below the bright line, the potential exists for significant state-to-state variation in the nature and degree of controls imposed on such media. History has shown that the existence of widely varying state standards can create incentives to dispose of wastes in states with the least regulated (read cheapest) facilities, and can create tensions between waste "importing" and waste "exporting" states. **EP**

Eli D. Eilbott is Deputy General Counsel of the Environmental Technology Council, a national association of firms that provide commercial treatment, recycling and disposal services for hazardous and nonhazardous industrial wastes.



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Management Activity	1991	1992	1993	1992-93	1991-93
	Quantity Billions of Pounds	Quantity Billions of Pounds	Quantity Billions of Pounds	Percent Change	Percent Change
Recycled On-site	12.520	12.196	13.191	8.2	5.4
Recycled Off-site	2.982	3.475	3.325	-4.3	11.5
Energy Recovery On-site	3.143	3.028	2.838	-6.3	-9.7
Energy Recovery Off-site	0.486	0.478	0.512	7.1	5.4
Treated On-site	9.448	10.040	9.768	-2.7	3.4
Treated Off-site	0.714	0.682	0.658	-3.5	-7.9
Released or Disposed of	3.662	3.425	3.206	-6.4	-12.4
Total Production-Related Waste	32.954	33.324	33.498	0.5	1.7



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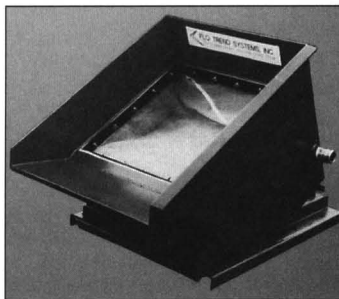
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Sham Disposal Operations on the Rise

By Terri Rayer

Despite stiff penalties and surging enforcement actions, unscrupulous hazardous waste disposal operators still abound – and even the most conscientious firms can find themselves in a liability fix they never would have imagined.

Consider this recent horror story:

In March, the Justice Department indicted two officials with a New Hampshire oil recycler for illegally transporting and recycling hazardous waste. Among unwitting customers of the operation, which officials say netted the disposal firm more than \$1 million: Mobil Oil Inc.

For almost two years, Beede Waste Oil in Plaistow, N.H., allegedly accepted more than 25,000 tons of soil contaminated with petroleum and other pollutants. Although their facility was authorized by the New Hampshire Department of Environmental Services to recycle contaminated soil and produce cold mix asphalt in 1991, NHDES officials now believe the company exceeded its contaminated soil limit that same year. After a 1991 inspection, state officials prohibited the company from accepting any more contaminated soil. But Beede Waste Oil continued to operate in a business-as-usual fashion, entangling 75 waste generators in their allegedly illegal operation.

Another sham story, this one profiled on ABC's *PrimeTime Live*:

A 1993 sting by Florida State Attorney's office to catch shady disposal operators uncovered a Jacksonville company, A.A. Septic, that was charging suspiciously low rates for hazardous waste disposal. Assistant Attorney General Rick Beseler told A.A. Septic he wanted to "get rid of a chemical he thought was toluene." The "toluene" was actually water colored with a dye provided by EPA.

A company employee was later caught dumping the fake toluene in a store parking lot.

Because the chemical was not a hazardous waste, however, the state was forced to charge A.A. Septic with illegal commercial dumping of materials more than 500 pounds.

Spotting Trouble

Jeremy Korzenik, a trial attorney with the Environmental Crimes Section of the U.S. Department of Justice, warns that sham dis-

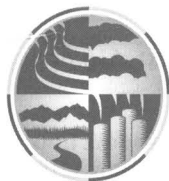
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WOULD OSHA SAY?**

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posal operations are getting better at disguising their operation with legitimate trappings. So how can generators, consulting firms and brokers know if they are in business with a risk-loving disposal company?

Do your homework, says Hugh Kaufman, assistant to the director of EPA's Hazardous Site Control Division.

"Get more information from a disposer than a copy of his permit," Kaufman says. "Get as much information as you would from a disposer as if you are entering into a large financial joint venture."

A company should have all of its permits and manifests before being considered for the job. Researching a disposal company's

permit status also allows you to see if any actions from former clients had been taken against them. Stephanie Taylor, an environmental affairs coordinator for Radian Corp. in Austin, Texas, said, "A lot of companies have had some action against them, but make sure how serious their actions were."

Researching a company's history should go beyond the paper trail. "It is a good idea to make a site visit," Taylor says. "A lot of companies will put out a lovely brochure, but if they have rusting barrels in a field, something might be wrong."

Contacting former clients can also give you an idea of the quality of business a disposer has done in the past, but educating your own employees can be even more important. Employees should be trained to ask the right questions to elicit any suspect responses, Taylor notes.

Developing a rigorous approval process for hiring disposal companies is worthwhile, experts agree. Getting a spectrum of opinions on the disposal firm is another safety measure. An engineer's view can be entirely different than one from a lawyer's perspective.

"Exercise tremendous due diligence," says EPA's Kaufman.

If You Get Hooked

If you discover the long-term venture you entered into is a sham, don't waste time before contacting authorities. If your local police department does not know how to handle the case, police officials should be able to connect you to a state environmental crimes unit. Although there is an EPA hotline for handling environmental crimes, Kaufman said local and state officials can provide assistance on a more individual basis.

"There has been a diminishment in enforcement from the federal government," Kaufman said. "Strong enforcement has shifted from the federal level to the state level."

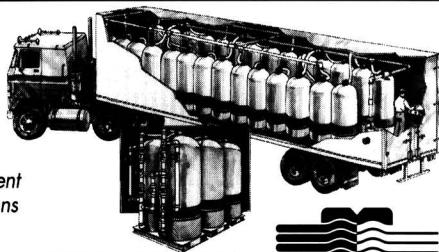
Another important reason to contact authorities: "You could be charged with conspiracy if you knew what the dumper was doing and didn't report it," said Korzenik of the Justice Department.

By working with law enforcement officials, victims can reduce their liability, regulators note. Kaufman recommends agreeing to participate in undercover operations to help catch the unscrupulous dumper.

Terri Rayer is an associate editor with Environmental Protection.

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Improving Performance Using Environmental Indicators

Olin Corp.'s environmental improvement process is based on quality improvement techniques we began many years ago in the areas of safety and plant reliability. From these efforts, we learned that if we can determine what is important, measure it, and report progress in the proper manner, then improvement will happen.

We adopted a Total Quality Management (TQM) process in 1987, and found that determining important measures begins with defining our customers and asking how they would measure success.

This customer focus was further reinforced when, in 1988, we signed on to the U.S. Chemical Manufacturers Association's (CMA) Responsible Care initiative. Under Responsible Care, we have pledged to do two key things — to strive to continuously improve our performance in the areas of health, safety and the environment; and to solicit and respond to public concerns about our products and operations.

One of the first efforts we made to apply these lessons was our Chemicals Group's establishment in 1988 of "Key Success Measures from the Perspective of the Community." Among others, one performance measure called for decreasing the volume of plant-generated hazardous waste 50% by 1993. A second aimed at reducing reportable air emissions under SARA Title III by 70 percent by 1993. In each case, the measures reflected key community concerns and values.

Despite the Chemicals Group's early experiment with these performance measures, it became clear that company-wide functional and business quality plans did not include enough environmental emphasis. As a result, senior management chartered a Steering Committee to develop a company-wide Environmental Quality Plan. Chaired by the company's chief scientist and including high-level executives from many divisions, the Steering Committee identified eight key environmental categories it felt addressed customer values and expectations.

The committee then established interim goals for each category for year-end 1994, based on extensive input from manufacturing and environmental personnel. To ensure that the company as a whole can achieve established goals, each of our facilities has an annual Environmental Improvement Plan, which includes, among other things, an updated set of action steps needed to implement performance improvements in the eight key parameters.

These eight environmental performance indicators address three broad areas of concern: Pollution Prevention, Compliance Issues, and Liability, which involve the following:

Pollution Prevention. The program utilizes data already

captured in the annual emissions reporting required under SARA Title III. A subset of the TRI report measures progress under the EPA's Voluntary Industrial Toxics Reduction Project, in which we agreed to participate in 1989. That program targets 17 high-priority industrial compounds selected by the EPA for reduction. As our plan reflects, we pledged to cut in half by year-end 1995 our emissions of these compounds.

Compliance. In this area, we focus on wastewater non-compliance and Reportable Quantity releases — or those releases requiring government notification at any level. This category also addresses our community's expectation that, at a minimum, we must operate within emission guidelines established by state and federal environmental agencies.

Liability. We recognize that one of our most vital responsibilities, both to our communities and to our shareholders, is to establish goals for improving Olin's waste management practices and reduce future problems and liabilities associated with that waste. (See box, page 56.)

In most cases, we have exceeded our year-end 1994 goals. It is important to remember, however, that these are really interim measurement milestones along a continuum of improvement; as a result, we recently established new stretch milestone goals for 1998. To keep the focus high on pursuing the interim goals, the eight performance measures are woven into Division plans and the facility plans mentioned earlier, as well as into monetary incentive plans.

As an early participant in the CMA's Responsible Care initiative, Olin learned that there are literally hundreds — if not thousands — of potential data points and performance measures involved in implementing the initiative's six Codes. One of the more innovative things we've done is to boil down those complex tasks and associated data points into a simple scale containing five key performance measures.

At Olin today, three of our seven divisions are measuring progress according to this 5-point scale, which we call the Olin Responsible Care index. Although the index was developed primarily for internal use, it too addresses both our employees' and communities' concerns and expectations regarding our health, safety and environmental performance.

The five Olin Responsible Care Performance Index Measures are as follows:

1. Total number of OSHA recordable employee injuries and illnesses;
2. Total number of contractor recordable injuries and illnesses;
3. Total number of manufacturing Process incidents;
4. Total number of Distribution incidents;

Charles W. Newton III is vice president for Environment & Regulatory Affairs with Olin Corp. Headquartered in Stamford, Conn. Olin's businesses are concentrated in chemicals, metals, electronic materials, defense, aerospace, and Winchester sporting ammunition. The company has roughly 35 manufacturing plants worldwide.

Measuring Performance: A Working Example

One of eight performance measures under Olin Corp.'s Environmental Quality Plan targets reducing the number of outside Waste Management Units used by the company. To limit any potential liabilities and problems associated with wastes, the firm uses a rigorous WMU Assessment program.

The program's criteria are designed to restrict our use of waste facilities to those whose owner/managers are financially sound and can handle waste in a safe, legal and environmentally sound manner. These criteria measure each facility's technical waste management capabilities; level of compliance with waste management laws and regulations; and financial stability, as indicated by debt load, diversity of clients, and related factors.

Olin environmental personnel conduct periodic site visits and other reviews, and each WMU is assigned a rating that indicates whether it should continue to be relied on. Although the program does allow facility operators to make improvements in some areas to meet Olin criteria, it also includes several pass-fail features.

Through this program, Olin has reduced the number of WMUs by 30% from 1991 through 1994 by eliminating those that were unable or unwilling to comply with the company's strict criteria. A new goal is to reduce the number of Waste Management Units by 40% by 1998.

5. Total number of Environmental incidents.

Each Olin manufacturing facility competes against individual goals for that particular facility. These goals are based on performance history in these areas and a management assessment of achievable targets. We've found that using the raw numbers of incidents – not weighted by man-hours, number of products, or volume of shipments – works best under each of the five categories. But we provide clear definitions of what we mean by "Process Incidents":

- A severity test, which includes a minimum value on damage done to property or equipment onsite or offsite;
- A chemical and/or process involvement test. A chemical or chemical process must have been directly involved in the incident.
- A location test. A fire, explosion or chemical release satisfies the location test if the incident occurs in production, distribution, storage, utilities, pilot plant, or laboratory areas.

Under the Environmental Incident category, we define such incidents to be one or more of the following:

- Noncompliance discharges to publicly owned treatment works (POTWs) or violations of National Pollution Discharge Elimination System (NPDES) permit levels.
- Listed reportable releases that must be formally reported under SARA Title III or CERCLA requirements.
- Community complaints received on an environmental incident or problem. This community element is important, because even though a release may not be large enough for reporting under SARA Title III, neighbors may smell the release or may otherwise be affected and concerned by it. From their perspective, they place a high value on being able to live free from fear or concern about environmental releases — and they don't much care if the release did or did not involve a so-called reportable quantity.

At the end of each year, we add up the raw numbers under each of the five categories to get one number — a number that provides a good snapshot of a particular facility's overall performance.

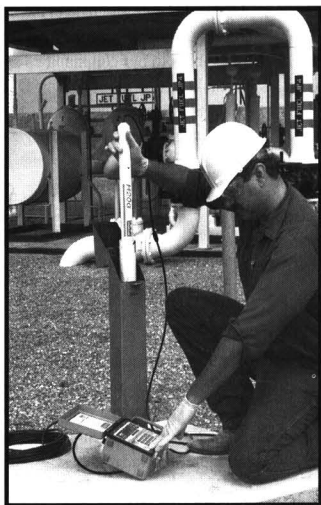
That's a nice way of bringing us full circle back to where we began — building an environmental improvement process on the foundation of Total Quality systems. By way of summary, keep these key points in mind: identify your customers; performance measurements should reflect customer values as well as expectations; and if you get the right elements in place, and report on them regularly, you will achieve continuous improvement. **EP**

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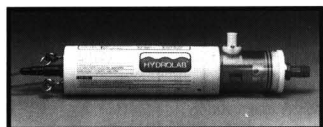


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EPA Speeds Reinvention Plans In Face of Hostile Congress

The Environmental Protection Agency is struggling to reinvent itself. The agency has made many promises in recent years to streamline regulatory complexities while still protecting the environment. Most recently, Administrator Carol Browner has made "common sense" the agency's rallying cry with an agency-industry partnership designed to tackle regulations on an industry-by-industry basis.

But lately, there's an added urgency inside agency walls over these efforts. A reform-minded House of Representatives has taken matters into its own hands with a bill requiring far-reaching risk assessment and cost-benefit analyses of regulations. Another House measure would force the agency to substantially overhaul its water and wastewater regulations.

And while the Senate is moving more cautiously in considering reform legislation, it too is weighing risk and cost-benefit bills. In the meantime, President Clinton and Vice President Al Gore have issued a call to arms called "Reinventing Environmental Regulations."

Released under the banner of the Gore-led National Performance Review, the report features 25 "high-priority actions" to make for more efficient regulating. The initiatives would reduce reporting and recordkeeping requirements, reform the enforcement process, and set up a number of pilot projects with industry to try out new ways of doing business.

Not all the ideas are new. Indeed, some have been debated for years. Effluent trading, for example, is a concept former Administrator William Reilly endorsed in 1992. And one of the initiatives would increase the use of regulatory negotiations and consensus-based rulemaking, a process EPA has used for a number of major regulations.

Other initiatives include replacing existing regulations with alternative strategies geared to producing better environmental results; a plan to reduce paperwork requirements for businesses by 25 percent; and projects emphasizing more use of risk assessment in decision-making.

Deadline Pledge

One key difference between the latest reform proposal and past efforts is the number of deadlines it places on EPA. And this time, EPA officials really want to make some changes, said Allan Abramson, a special assistant to Lynn Goldman, the agency's assistant administrator for prevention, pesticides and toxics substances. "It's going to take six to 12 months for a lot of these projects to move forward, but my expectation is that they will," Abramson

said. "There's a lot of commitment to do this within the agency.

"I'm pretty excited," he added. "I think the opportunity to do new things is there. It's up to the outside community to respond to it."

Under the reinvention agenda, by April 15 the agency is supposed to have convened a "multi-stakeholder process to identify a legislative package of 'rifle shot' reforms to fix provisions of RCRA that result in high costs and marginal environmental benefit," the report promises. And by June 1, EPA is scheduled to have:

- identified rules now under development that would make good candidates for regulatory negotiation;
- reviewed all its monitoring, recordkeeping and reporting regulations to identify those that are "obsolete, duplicative or unnecessary;"
- reviewed all its regulations and identified those it can eliminate or simplify.


Facilities that are part of EPA's Common Sense Initiative, as well as other facilities chosen by EPA, would be eligible to take part in "Project XL," another reinvention initiative. Under the program, EPA would support demonstration projects to show that better environmental management strategies can outperform existing regulatory requirements.

Industry representatives welcome the plan with an air of polite skepticism. Many are waiting to see if EPA will be able to move beyond rhetoric before Congress hands the agency a ready-made reform package.

"Overall, these are in sync with NAM's regulatory goals," said National Association of Manufacturers Associate Director of Environmental Quality Theresa Larson. But she added that the effort's success "depends on the willingness of EPA officials to implement it."

Several of the items addressed issues that "we've been talking about for a long time," said Wendy Lechner, legislative representative of The National Federation of Independent Business, which represents 600,000 smaller companies. As examples, she pointed to paperwork reduction and a policy that would give small businesses a grace period of up to six months to correct violations identified by state or federal compliance assistance programs.

Even partial success would be an improvement, according to some.

"I don't care if they do all these things. If they do a large portion of them I'd be very pleased," said Kevin Bromberg, an attorney in the Small Business Administration's Office of Advocacy. 

Steve Davies is a senior editor with Environmental Protection.

NEWS UPDATE

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The recycling community, whose markets have been limited by product inconsistencies and communication barriers, cheered EPA's announcement. With the new system in place, companies and cities managing recyclables will have "an incentive to produce a higher quality product to sell to someone outside their usual shipping area," said Edgar Miller, executive director of the National Recycling Coalition's Recycling Advisory Council.

To prepare for the trading, which is expected to begin for a variety of commodities this fall, CBOT has entered into partnerships with the coalition, Washington State's Clean Washington Center and the New York Office of Recycling Market Development. The coalition will market the electronic system to the recycling community through a series of regional workshops later this year, Miller said.

Subscribers to the electronic system will pay about \$1,000 for a year of access to an internal bulletin board, said Bill Walsh, who is overseeing the project for the board. "Recyclables have become such a valuable commodity that we are expecting large inter-

national participation," he said.

Call Chicago Board of Trade's Andrew Maner at (312) 435-3620.

EPA Asked To Treat Coal Tar As Hazwaste

The Environmental Technology Council (ETC) has petitioned EPA to list certain coal tar residues as hazardous waste under the Resource Conservation and Recovery Act, arguing that coal tar is an extremely toxic waste that has polluted soil and groundwater at hundreds of sites across the country.

What's more, some methods being used to clean up coal tar are unsafe, the group said. In particular, coal tar wastes are being deposited in unlined landfills, burned in asphalt plants that don't have toxic air emission controls and burned in utility boilers that don't meet hazardous waste incineration requirements, said ETC deputy general counsel Eli Eilbott.

The tar in question is coal residue left over from a process called coal gasification that was used in the United States for roughly 150 years. It was abandoned in the mid-1900s.

The potential financial exposure for utilities and other contaminated-site owners is great, if cleanups were to be required, EPA environmental scientist Marlene Berg said. There are 11 coal tar sites on EPA's National Priorities List, and another 124 sites on a list of contaminated sites that EPA is still evaluating. But other utility estimates show there are probably more than 1,500 contaminated coal tar sites scattered across the country, Berg said. No one knows the actual nationwide cost because few sites have been cleaned up and because the total number of sites is unclear.

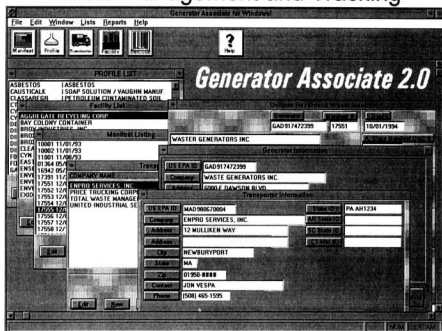
Interested parties can submit information on coal tar cleanup technologies to Berg at EPA by fax only at (703) 603-9100.

House Committee Passes Clean Water Act Overhaul

A congressional committee's approval of a Clean Water Act reauthorization bill has cleared the way for a vote on the floor as early as May.

continued on page 64

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Superfund In the Age of Newt: What Do We Do Now?

"All changed, changed utterly: A terrible beauty is born."

William Butler Yeats penned those haunting lines to describe the 1916 Easter Uprising in Ireland, but I wonder if they might someday be applied to the 1994 "Electoral Uprising" in America. It is not the purpose of this article to provide yet another "spin" on the whys and wherefores of the Republican takeover of both houses of Congress, but I will offer a few observations on how that cataclysmic event might impact an issue of interest: CERCLA reform and reauthorization.

The backdrop is stark: an activist President and Congress of the same party, newly pragmatic businesses and insurers — all coming together during the 103rd Congress to sculpt a new and improved Superfund. Pundits pontificated, politicians preened, PRP's pleaded, bills sprang to life, drafts and counterdrafts circulated — and absolutely nothing happened.

"Conventional wisdom" held that if Superfund reform could not survive the supposedly favorable political circumstances of 1993-1994, it would be even more difficult to bring it about in the "somewhat" more Republican Congress expected after the 1994 midterm elections. But then there was a quaking of the firmament that thrust Newt Gingrich to the Speaker's podium of a Republican House. What now for Superfund?

First, a prediction: at the end of the incoming 104th Congress, CERCLA will look pretty much the way it does today. The best time for the new Republican majority to enact any substantive changes to the law will be in the first ninety days of the next Congress, when its strength — and the Administration's willingness to compromise — will be greatest.

Possible legislative changes that might move in early 1995 include some clarification of the lender liability issue and perhaps some relief for municipal generators (the host of the new Republican governors might provide a strong push for this one). Repeal of retroactive liability will go nowhere. Insurance reforms might prove too controversial to survive a Democratic filibuster. Environmental activists are probably still strong enough to block major changes in cleanup standards, although they might be able to live with some recognition of future use of the site as a criterion.

The Republican "Contract" did not reference CERCLA by name, but did have one plank that might have a

backdoor impact: the call for greater use of risk assessment and cost effectiveness in setting goals for federal programs. I can envision a scenario in which the Congress passes a generic requirement that federal agencies conduct an assessment of activities proposed under their regulations to determine if the costs bear some reasonable relationship to the risk of not going forward and to evaluate whether the proposed project represents a sound prioritization of limited public and private resources. The enviros would probably knee-jerk in opposition to this, but if the election returns suggest that the public truly wants the federal government to be less intrusive and to provide more "value" for tax dollars spent, then a generic, broadly-worded requirement that it try to set some priorities just as businesses and private citizens do might be politically hard to resist.

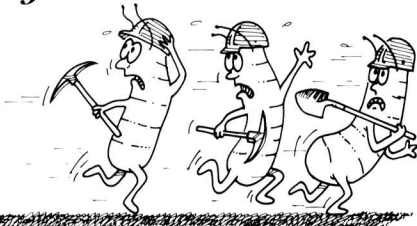
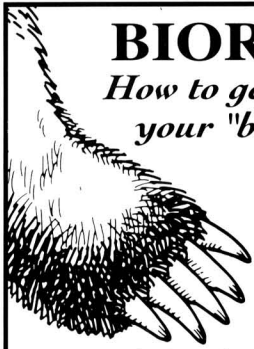
Under a risk assessment regime the states, the local communities, and the PRP groups could all question a host of CERCLA decisions, from NPL listing to need for remediation to level of remediation and cleanup standards. It would make for some interesting alliances and put some fundamental questions on the table. Does remediating Site X provide a greater environmental benefit than, say, cleaning up a direct industrial discharge into a major river? In Community Y does it make more sense to deal with indoor air pollution issues than to pump and treat groundwater that is not used for public water supply? Is capping Site Z and providing public water to nearby residents enough to protect public health, or does contaminated soil have to be excavated or treated too? The present CERCLA approach is heavily biased toward treatment for treatment's sake with the goal of making every site as clean as it was when Columbus arrived. The new Republican majority, reflecting what it believes to be the public will, may well ask if this approach is the best use of societal resources.

As suggested above, I do not believe that there will be fundamental changes in the CERCLA program over the next two years. This is unfortunate, and perhaps cynical, but I think realistic. Does this mean that all the effort and energy devoted to Superfund reform in the last Congress has been wasted? Not necessarily. I believe it will be helpful if "stakeholders" are willing to seek some incremental changes. One area ripe for this involves lender liability. If the Supreme Court does not hear or affirms the lower court ruling invalidating EPA's rule on the matter, it

Thomas F. Harrison is Partner with the Stratford, Conn.-based law firm of Day, Berry & Howard. An environmental attorney since 1970, Mr. Harrison has served as assistant attorney general in New York's Environmental Protection Bureau and enforcement chief for EPA's New York region.

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Guest Commentary


may be possible to achieve a congressional "fix" in the next session. The EPA approach was sound and could easily be adopted by the Republican Congress; since it came out of his own Agency, the President should be able to sign it.

The Republican majority might be included to provide tacit approval to an EPA proposal to limit municipal generator liability at CERCLA sites, particularly since a congressional fix could lead to a donnybrook. If the Congress, the Administration, and the governors were able to reach an informal consensus on a dollar or a percentage "cap", an EPA rulemaking might be allowed to occur without the need for Congress to take a public stand. The new political lineup may make this a great deal more likely than was the case before.

In the interim, however, the municipal liability situation is the same: the statute does not treat them any differently from private parties. My guess is that municipal generator PRP's will continue to avoid settling in the hope that stalling long enough will bring them the relief they seek. Private PRP's would be wise not to bank those municipal dollars just yet.

PRP's who had been stalling on cleanup agreements in the hope that more lenient standards would have come out of the last Congress will have to reconsider their positions. In the absence of the risk assessment scenario described above, I believe it is unlikely the Republicans could — or would want to — alter the current approach. The Democrats and the enviros could probably persuade the President to veto anything they consider too radical, and the GOP does not have enough strength to override a veto. It may be possible to agree on some modest, incremental changes, such as allowing consideration of the likely future use of the site in determining the level of cleanup. This is a reasonable approach that may be acceptable to enough Democrats, and the President, to make it happen.

But once again, unless and until there is a change, PRP's should expect to go forward under the current criteria. I think it unlikely that EPA will tolerate any delaying tactics on cleanup standards; if there is not voluntary action, the Agency will either undertake the remediation itself or else issue a Section 106 Order.

The voters were unequivocal in expressing their political preferences in the 1994 midterm elections. While it will surely be unsettling to many who have grown comfortable with the old order, particularly with regard to the Superfund process, I do believe that the nation has in fact witnessed the birth of that "terrible beauty" contemplated by Yeats. 

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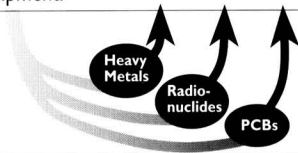
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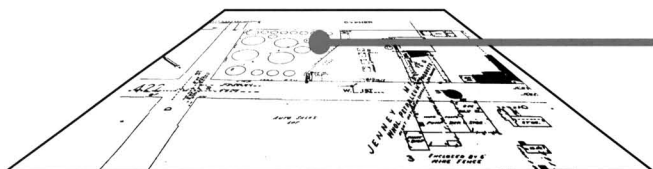
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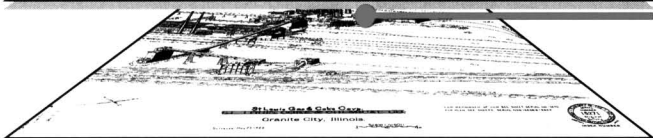
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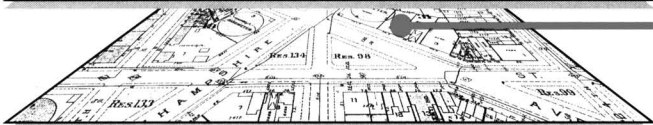
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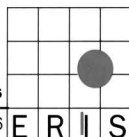
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NEWS UPDATE

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During three days of debate on amendments to the bill, the GOP majority and sympathetic Democrats on the House Transportation and Infrastructure Committee soundly defeated numerous amendments that would have softened controversial sections of the bill, including its wetlands, nonpoint source, risk assessment and cost-benefit analysis provisions. HR 961 has drawn pointed criticism from the panel's Democratic leadership as well as from EPA officials and environmental groups.

In a letter to committee Chairman Bud Shuster (R-Pa.), Assistant Administrator for Water Robert Perciasepe said the bill "contains serious flaws" that "would significantly delay progress we are making under the current Clean Water Act ... and undermine the achievements we have made to date."

But Charles Ingram, executive director of the Clean Water Industry Coalition, said the bill gives the business community "the tools to target our resources to the most pressing environmental problems."

Shuster said he expects House floor action

on the bill to begin in May or June. On the Senate side, an aide to Senate Environment and Public Works Committee chairman John Chafee (R-R.I.) said Chafee does not plan to take up CWA reauthorization until sometime this summer. Chafee has said he does not think the act should be extensively rewritten.

Effluent Guidelines Target Metal Products, Machinery

Toxic pollutants discharged by the metal products and machinery industry would drop by about one million pounds per year under new effluent guidelines proposed by EPA, the agency said. Although over 10,000 dischargers of wastewater could be affected by the regulation, EPA said that exempting "low-flow" indirect dischargers—those discharging less than 1 million gallons per year to treatment plants—will shrink the number of affected facilities to fewer than 4,000.

In addition, the guidelines would reduce the metals content of municipal sludge. That would allow about 184 publicly owned treatment works (POTWs) to land-apply an addi-

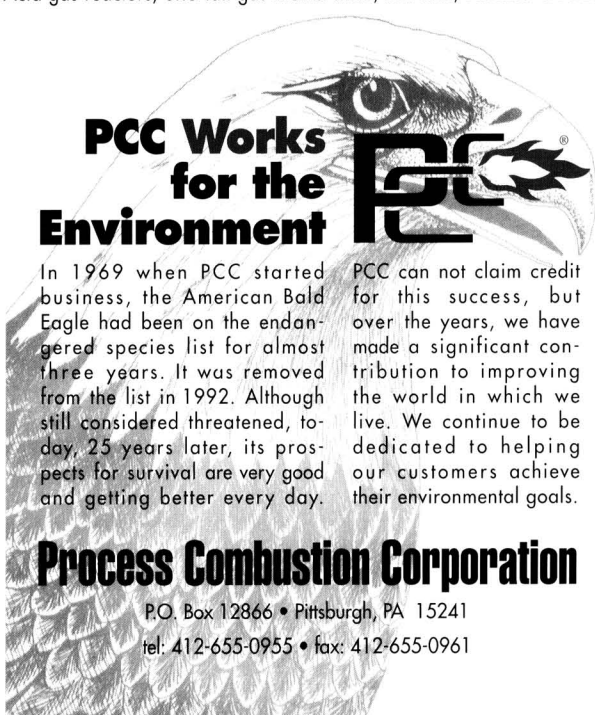
tional 439,000 dry metric tons of sewage sludge rather than incinerating or landfilling it, saving between \$39 million and \$86 million, EPA said.

Exempting indirect dischargers of less than one million gallons per year reduces the annual compliance cost for the proposed guidelines from \$227 million to about \$161 million, EPA said. Benefits of the guidelines would total between \$70 million and \$227 million, EPA said.

The proposed standards and effluent limits apply to existing and new facilities that manufacture, maintain or rebuild finished metal parts, products or machines in the following industrial sectors: aircraft, aerospace, electronic equipment, hardware, mobile industrial equipment, ordnance, and stationary industrial equipment.

The proposal includes concentration-based limits and requires permit writers to convert these into mass-based limits based on an appropriate process wastewater flow rate. "Mass-based limits help to prevent compliance through dilution in lieu of control and encourage water use efficiency," an EPA fact

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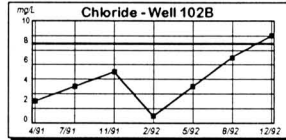
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sheet said.

A 90-day comment period was to follow release of the rule at the end of April, according to EPA project manager Bill Cleary.

Great Lakes Water Plan Blasted By Business

A final Great Lakes Water Quality Initiative contains numerous changes in response to criticisms submitted by businesses, states and localities during the two-year public comment period. Among the changes are new provisions on mixing zones, intake credits and the anti-degradation policy, EPA assistant administrator for water Robert Perciasepe said. Unlike the draft GLI the agency proposed in April 1993, which it estimated would cost anywhere from \$300 million to \$640 million annually, EPA estimated the final GLI's cost per-year at between \$60 million and \$380 million.

The initiative's water quality criteria, which address 22 so-called "bioaccumulator" chemicals, "will remove toxic chemicals from the lakes and help protect the safety of a drinking water supply that serves 23 million people," EPA Administrator Carol Browner said.

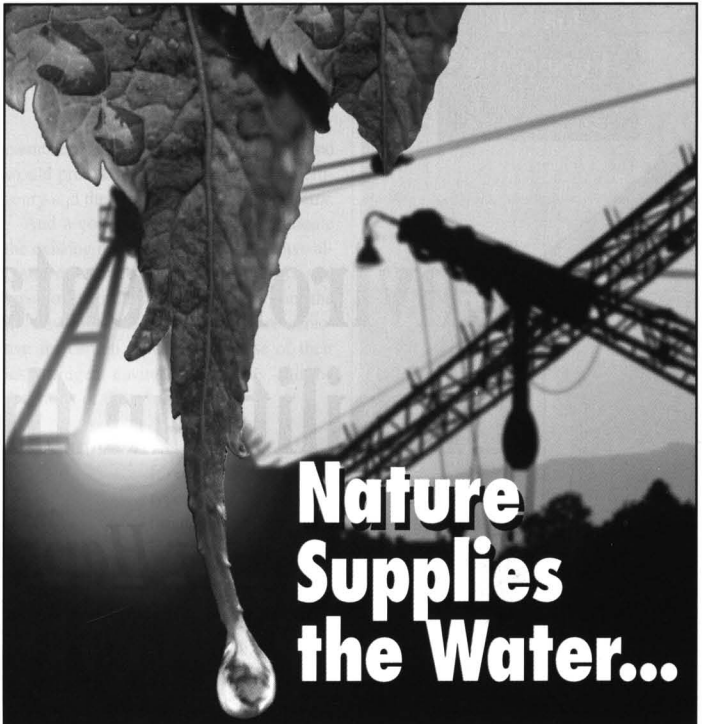
But to the Great Lakes Water Quality Coalition, which represents municipalities and businesses in the region, these and other changes were not enough. "The GLI remains an unfunded mandate with an enormous price tag that must be paid for by municipal taxpayers and industry," the group said.

Two Superfund Settlements Total Almost \$45 Million

In two settlements about two weeks apart, almost \$45 million was committed to clean up Superfund sites in Minnesota and Indiana.

On March 9, the federal government, the state of Minnesota and 15 private parties agreed to contribute \$20 million to the cost of removing oily residues and carcinogens from the Arrowhead Refining Company site near Duluth. Twelve days later, EPA accepted a check for \$24.8 million from more than 1,000 de minimis contributors to a Griffith, Ind., Superfund site.

"Companies with proportionally modest responsibility for cleanup have few good reasons to sit back and wait to be sued," said John Lingner, a Chicago attorney and one of the de minimis trustees who presented EPA Region 5 Administrator Valdas Admakus with the check for the Griffith, Ind., site.



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Environmental Liability in the EU

The Search for Harmony Continues

In the European Union, a polluter's liability is still governed by the widely varying laws, regulations and enforcement policies of each of the 15 member states. Unfortunately, it doesn't look like this regulatory diversity will be eliminated any time soon, since some of the union's most powerful members think the liability issue is best handled by individual countries.

Meanwhile, the EU Commission has awarded contracts for two major studies on the issue, which should be completed by yearend. Some observers expect the commission's staff to use the studies to support a decision in favor of a unified liability scheme. The commission's position should also be helped by the recent accession of Austria, Finland and Sweden to the EU. These solidly "green" countries could tip the EU balance in favor of harmonization of civil liability standards for environmental damage.

U.S. businesses that want to branch out into Europe might think lax environmental liability laws in some countries would benefit them. But in the long run, doing business in Europe would be much easier with a common environmental liability system.

A look back at events over the past few years can help to shed some light on the direction the commission might take in the future.

"Green Paper" Debate

A common, integrated civil liability regime has been a goal of the commission since 1992, when the EU adopted its Fifth Environmental Action Program for 1993-2000. The latest program contemplated adoption by member states of a common civil liability system to deal with pollution damage. Such a regime would complement vigorous regulation, create incentives to manage pollution risks properly, and provide a way to assign environmental costs within the EU.

But the depth of political disagreement over the lia-

bility issue became apparent after the commission issued its "Green Paper on Remedying Environmental Damage." The report, a review of alternatives and issues, was not meant as a position paper, but simply as a way to stimulate discussion. It solidly achieved that end, provoking, along the way, a storm of controversy and debate. More than 120 written responses — from governments, national and international organizations, private firms and individuals — were formally filed with the commission, and many more comments were communicated informally. Some of the criticism of the paper came from members who said that it appeared to favor an EU-wide civil liability regime for environmental damage based upon the polluter pays principle and the concept of strict, rather than fault-based, liability.

Germany and the United Kingdom objected to a broad-based harmonization of environmental liability standards, suggesting instead that the "principle of subsidiarity" should control this area. Supporters of that principle believe the EU should let countries handle certain issues through their own legislation. France is also thought to be in the subsidiarity camp on this issue, although it did not file an official response to the Green Paper.

On the other side of the aisle, Denmark voiced its support for a regime of minimum harmonization. Luxembourg, Portugal and The Netherlands firmly supported the notion of a comprehensive, EU-level harmonization. In addition, remarks in September 1994 by Prime Minister John Major can be interpreted as a softening of the U.K. government's oft-stated opposition to harmonization in environmental matters.

Cautious Stance

Because of the wide difference of political opinion on the subject and the controversy generated by the Green

Paper, it seems unlikely that the EU will take significant action any time before the beginning of 1996. The fence-sitters in the EU will probably await the ultimate outcome of the Green Paper discussion.

The commission seems to be proceeding cautiously in light of the considerable differences of opinion among member states. Looking ahead, it seems unlikely that any definitive commission action on environmental liability, such as the issuance of a proposed directive, will occur before middle or late 1996. In the meantime, the commission appears to be looking for data to support whatever it ends up proposing on liability. It has recently awarded contracts for two major studies: One will review and summarize the existing civil liability systems in each of the EU member states, as well as in Japan and the U.S. The other will investigate and report on the economic effects of strict liability regimes and joint-compensation funds for environmental damage. The outcome of these studies, which are scheduled for completion toward the end of the year, will undoubtedly be important factors in the commission's final decision on this subject.

Uniform Liability Makes Sense

The political stalemate is unfortunate, because the lack of a common system hurts both business and the environment. The current "patchwork quilt" of national and regional environmental liability laws is neither a common market nor a level playing field. Yet pollution, particularly air and water pollution, is a shared problem. It can and often does cross national boundaries.

A uniform environmental liability policy in the EU would benefit not only business, which would better be able to determine its environmental obligations and manage the associated risk, but also the environment. Harmonized rules would insure that polluters in all EU countries faced similar and adequate civil liability for environmental damage — both for cleanup and restitution — regardless of the place of the damage. Harmonized rules would also prevent some

countries from lagging behind the rest and would provide equal protection of the citizenry and the environment in each country.

And a common policy would eliminate the existing market distortions that have already developed. The varying levels and types of environmental liability within the EU have made some countries more attractive for certain industries because of their less stringent environmental rules — to the detriment of the others.

The Future?

*The current
"patchwork quilt"
of national and regional environmental
liability laws
is neither a
common market
nor a
level playing field.*

It seems clear that some type of EU directive ultimately will emerge. However, given the significant differences among the existing legal systems and regimes in the EU countries, the actual proposal is likely to be a framework which sets threshold or minimums directive, rather than a prescriptive one, meaning member states will have plenty of freedom to choose how they conform to the directive's requirements.

Still, based upon events to date, some predictions about the proposed directive can be hazarded:

- It will adopt the "polluter pays" principle in those situations where the polluter can be identified and charged for the damage.
- It will probably impose a strict liability standard, particularly for certain activities considered dangerous to the environment, such as waste treatment, storage and disposal operations and activities involving specific hazardous substances.
- Environmental liability insurance will be mandatory for many waste-related activities.
- Some type of joint compensation fund will be established for situations where the polluter cannot be found or is financially insolvent.

Retroactive liability was not an element in the Green Paper's discussion and is not likely to be a part of any future directive. Nevertheless, even a strictly prospective regime will have to face this issue in practice, if not in terms, because of the difficulty of dealing with gradual pollution. **EP**

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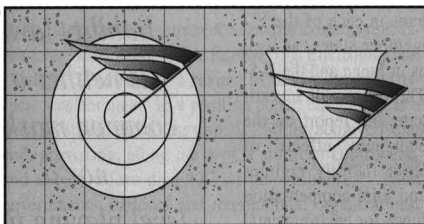
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Training Resources On the Internet

The federal government is harnessing the Internet in an effort to improve access to environmental training materials.

EPA, OSHA and DOE have each established extensive, interactive databases on the Internet's World Wide Web. These databases are often "seamless," allowing users to shift from one government database to another using simple menus. All offer convenient comment boards for soliciting new information or giving agencies a piece of your mind. And they provide real-time document portability for large government documents – avoiding overland mail and its inevitable delays.

EPA's Public Information Server ([HTTP://WWW.EPA.GOV](http://WWW.EPA.GOV)) provides feedback mechanisms, a title and content search engine and other research capabilities. A "keyword" search system allows users to scan for related documents over a broad range of documents. "What's New" and "What's Hot" sections provide comprehensive updates on the full range of EPA topics. An experimental "People Locator Program" using surnames and phone numbers is among the newest additions.

EPA's package also highlights specific topics such as the Environmental Monitoring and Assessment Program (EMAP) and the Great Lakes Information Network. Despite occasional lapses in information and technical problems, EPA is providing yeoman service in disseminating research and regulatory data.

The OSHA Home Page ([HTTP://WWW.OSHA-SLC.GOV](http://WWW.OSHA-SLC.GOV)) is a well-organized site developed by the OSHA Salt Lake Technical Center. Updates are provided twice weekly and a simple search engine allows access to all 29 CFR and any applicable Federal Register topics.

Of great value to the trainer or compliance officer is an on-line document entitled OSHA Standard Interpretations. More than 150 detailed interpretations of 29

CFR 1910.120 alone are listed in the database. Gathered from various facilities on their compliance efforts, Standard Interpretations is useful in customizing training for specific site or organizational needs. Current corporate settlement agreements are available, too.

Technical Information Services ([HTTP://Dewy.TIS.INEL.GOV/](http://Dewy.TIS.INEL.GOV/)) provides a comprehensive site for DOE materials. The "What's New" component includes tools and information on NEPA and a "Future Enhancements" section. The "TIS Newsletter" describes lessons learned from specific chemical incidents. Instructors may find these useful in developing conceptual risk assessment scenarios, as anecdotal illustrations during lectures, or as topics for group discussion. Sample MSDSs can also be downloaded. Interesting DOE Interpretations of OSHA standards can also be found.

The U.S. House of Representatives Internet Law Library ([HTTP://WWW.PLS.COM:8001/HIS/CFR.HTML](http://WWW.PLS.COM:8001/HIS/CFR.HTML)) provides an experimental server dedicated to making the CFR available to the public at no cost. An elegant five-option search engine provides a range of queries for targeting various government databases.

Other federal agencies including ATSDR and FEMA provide valuable ancillary information and are equally easy to find on the Internet.

A home computer, modem and telephone are all an inquisitive instructor needs to sift through these federal resources for good training materials. Major online services such as America Online, Prodigy and CompuServe provide links to the Internet and charge for that service. Perhaps a more economical route is to use a local server that provides a variety of accounts for Internet access – based on time and customer need. Your local librarian or computer store should have information on local servers and available classes. Start your engines. **EP**

*Kenneth C. Taylor, CET,
is programs coordinator
for the Environmental
Training Group of
Columbia, Md. His
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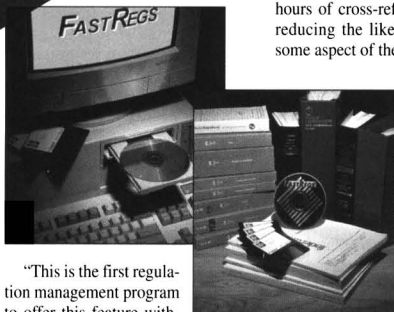
BR

EP Exclusive

State-of-the-Art Regulatory Compliance Software

Environmental and safety professionals responsible for keeping up with government regulations may be interested in several new features on FastRegs, a computer software package.

Offered by **ACHIEVE! Technology, Inc.**, of Amherst, NH, the 4.0 version allows users to add corporate information to their compliance data. Policy manuals, standard operating procedures and company-specific manuals are among items that can be added in this regulatory software.



"This is the first regulation management program to offer this feature without requiring special processing by the software vendor," says company president, Peter Bragdon. "Users can instantly access and cross-reference company materials with the existing regulatory information — saving

hours of cross-referencing time and reducing the likelihood of missing some aspect of their regulatory compliance program," adds Bragdon. Company literature suggests this feature also may prove useful for environmental audits.

The software also features optional access to other government documents along with Federal Register and CFR listings. FastRegs has an expanded database of regulation-related materials published by EPA, OSHA and other government agencies — including guidance docu-

ments. Other offerings include the ability to simultaneously search a topic across different agency regulations; narrowed and proximity searches; and the option to print or save regulations on disk files.

FastRegs 4.0 is offered for Windows and DOS formats, and is also available in multi-user network versions. The latter allows organizations widespread access via LANs and WANs. The program, designed to be compatible with Microsoft's "Windows 95" format due out later this year, is available on CD-ROM or diskettes. Customers receive free technical support via a toll-free hotline, and users can also directly access the user manual on-screen.

The 4.0 upgrade will be available by mid-summer.

Circle 65 on card.

Water Monitoring Brochure

Sci-Tec Instruments has introduced a new color brochure to acquaint you with Merlin and Sherlock Water Monitoring Systems throughout the United States. Merlin and Sherlock use sophisticated monitoring and sampling technology. Remote communications abilities are also included, for around the clock pollution detection and security. Merlin is a floating system that can be anchored mid-stream in any fresh or salt water environment. Sherlock is a transportable, bank-side system ideal for use in shallow water applications such as monitoring discharge outlets.

Sci-Tec Instruments

Circle 66 on card.



Thermal Oxidation System

Eco Waste Solutions has introduced the Eco Waste Oxidizer System to reduce waste disposal costs and waste volumes by more than 90 percent at the site. The

thermal oxidation system is for non-hazardous solid waste, medical waste and non-hazardous liquid waste. The thermal oxidizer can process two tons per day and is used in hospitals, municipalities, industrial parks, cruise ships, military bases, landfills, mining camps, shopping complexes, national parks and medical waste destruction systems.

Eco Waste Solutions

Circle 67 on card.



Ultra-SpillDeck

New, low-profile, secondary containment storage pad. Four and two drum modules are available. Modules are connected to each other with bulkhead fittings, allowing leaked materials to flow from one module to the next, thereby "borrowing" containment from adjacent units. Modules are 5.75" tall, and optional loading ramp available. Meets EPA and Uniform Fire Code Spill Containment regulations.

UltraTech International, Inc.

Circle 68 on card.



DCR/DST Measurement System

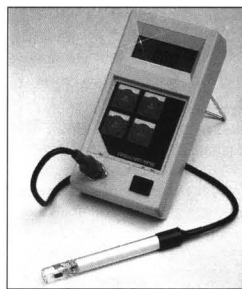
The 1000 Series DCR/DST non-contact measurement system is micro-processor controlled, and uses ultrasonic sound to measure distance or level in most applications. Outputs provide multiple trip points for alarm or pump control functions and proportional analog signals. DCR controller available in 12-24 VDC or 110/220 VAC power. A four-digit display provides distance or level readings. The unit is programmed through a built-in key pad, and has a range of 35 feet. Coaxial cable provides communication and power between sensor and controller to a maximum of 2000 feet. A variety of mounting options are available.

Lundahl Instruments Inc.

Circle 69 on card.

Portable Conductivity Meter

Omega Engineering's CDH-280 portable conductivity meter is microprocessor based with four selectable ranges. Applications include water quality testing, electroplating and desalination. The unit fea-



tures automatic temperature compensation, a fixed 2 percent Celsius temperature coefficient and a splash-proof enclosure. The meter measures from a low range of 0-199.9 $\mu\text{S/cm}$, up to 0-199.9 mS/cm . Sensors are available with glass, epoxy and polymer bodies.

Omega Engineering

Circle 70 on card.



Mobile SVE System

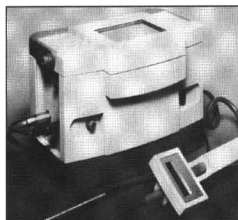
Soil vapor extraction system for larger remediation sites. The SVE System is mounted on two 40-foot trailers, and can extract up to 1000 pounds of soil contaminants per day. Uses carbon adsorption technology with three high-speed centrifugal blowers. A chiller controls heat

PRODUCTS & SERVICES

generated by blowers. System can be disassembled and made into three separate units. Sensors measure dew point, relative humidity and barometric pressure. Control room has sensor array, programmable logic controller and monitor, temperature set points, flow monitors and safety shutdown systems.

Barneby & Sutcliffe Corporation

Circle 71 on card.

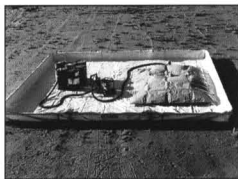


Portable Hydrocarbon Analyzer

Viewport, a portable hydrocarbon analyzer, integrates sampling, data logging and report generation. Works on flame ionization principle and is designed for parts per million detection applications such as EPA Method 21 compliance testing, fugitive emissions monitoring, industrial hygiene monitoring, hazardous waste sites and soil gas monitoring.

Control Instruments Corporation

Circle 74 on card.



the liner can contain up to 26,000 U.S. gallons. Deployable by two workers in 90 minutes. Can also be used for vehicle and heavy machinery washdown.

Exploration Products Inc.

Circle 76 on card.

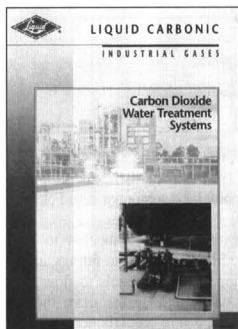


Degreaser/Cleaner

D-Greeze 500-LO is a new formulation of D-Greeze 500 for cleaning/degreasing of aircraft metals including cobalt, magnesium, titanium, aluminum, stainless and carbon steels, copper and brass. It is an alternative to hazardous solvents for cleaning machined parts, stamped metal parts, electronic components and printed circuit boards. Packaged in 55-gallon drums and in a five-gallon trial size.

Solvent Kleene Inc.

Circle 77 on card.



Water Treatment Brochure

The six-page brochure explains how carbon dioxide (CO₂) can be used for lowering the pH of various kinds of alkaline waters in municipal facilities and in industries that include food, textile, chemical, petroleum

and pulp and paper production. Several types of CO₂ injection equipment are also described and illustrated. Liquid Carbonic's LiquiPhase™ system offers greater control and eliminates on-site acid storage and handling.

Liquid Carbonic

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Particulate Continuous Emissions Monitor

TESS, a particulate continuous emissions monitor, makes direct, real time measurements of gas-borne particulate concentration in low or high temperature exhaust or waste stream. Probe or eductor versions are available. Measurements are independent of particle velocity, chemistry, morphology or size. The unit can detect particle concentrations to 1 ppb by volume. The portable TESS has an integral cooling system for operation to 1000 degrees F gas temperatures, and is configurable as a PM-10 probe (0.5 to 10 µm).

Insitac Measurement Systems

Circle 79 on card.

UV/Oxidation System

Perox-Pure UV/Oxidation System is an on-site system for destroying organic contaminants found in aquifers beneath the site. These contaminants include volatile organic chemicals, semi-volatiles and various alcohols and ketones. Perox-Pure can operate as part of a treatment train that includes metal/solids pretreatment and a liquid-phase granular activated carbon post treatment to remove residual hydrogen peroxide.

Peroxidation Systems

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Carbon Absorption Canister

VentSorb-PE, a new polyethylene activated carbon absorption canister designed for low-flow purification applications at industrial and muni-

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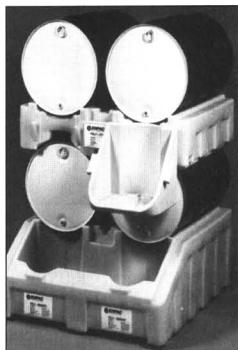
ROBINSON INDUSTRIES, INC.

Air-Moving Equipment

Free catalogue offers a variety of custom built, industrial air-moving equipment. The company's line includes standard backward curve fans, exhausters, pressure blowers, customized mechanical draft fans and special alloy fans. Fan repair and rebuilding services are also available.

Robinson Industries

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Barrel Racking System

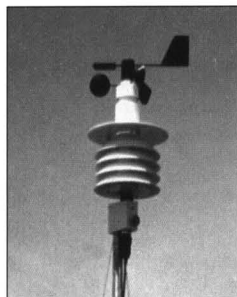
Enpac introduces Poly-Rack™ System that provides racking, dispensing and secondary containment all in one unit. The system is composed of three parts, the Poly-Racker™, a one-piece polyethylene rack that holds two 55-gallon drums, a spill protector and a 100-plus gallon sump, all of which holds up to 3,000 lbs. The Poly-Stacker™ holds two 55-gallon drums and fits onto the drums on the Racker. Poly-Shelf™ attaches to the Stack for dispensing from second level of shelves. The Shelf has a hole in case of a spill, which allows the liquid to flow to the sump.

ENPAC Corporation

Circle 75 on card.

Secondary Containment

The frame-supported Insta-Berm is an inexpensive liner for spill containment. Offered in various sizes



Automet 25

The Automet 25 is an automatic weather station measuring wind, temperature, pressure and humidity, recorded in digital data form. Unit is fully wired for on-site assembly without tools and is factory calibrated to NIST standards. Optional alarms and controls are available.

Met One Instruments

Circle 73 on card.

PRODUCTS & SERVICES



cial facilities. The canister eliminates dead air flow spaces, thus reducing risk of exotherms. It provides air flow capacities up to 200 cfm at low pressure drops. Spent canisters are recyclable, and pre-approved units may be returned to Calgon Carbon for carbon reactivation. Applications include storage tank vents, reactor vents, API separator vents, sludge thickener tanks at waste treatment plants, sewer gas vents and chemical plant wastewater holding tanks among others.

Calgon Carbon Corporation

Circle 81 on card.



Soil Probing Machine

The Model 4220 Mule soil probing machine is mounted on a Kawasaki Mule 4x4 utility carrier and can probe soil in areas of tight clearance or rough terrain. The 4220 can probe and sample to depths of 45 feet or more. The unit is powered by a Vtwin, water-cooled engine and features the Geoprobe GH-40 soil probing hammer.

Geoprobe Systems

Circle 82 on card.

Telemonitoring Control System

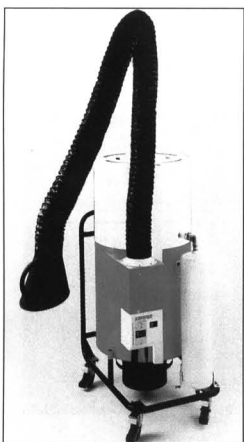
ProControl Series II is a telemonitoring and control system with a programmable logic controller, an LCD readout, a tactile keypad, a datalogger, a FAX reporting system and a remote monitor. ProControl links with a PC via modem and runs Windows-based ProView software.



Available with up to 54 digital and analog I/O points, the ProControl can perform control algorithms including PID loops and can log up to 16,000 data points in its battery backed memory.

EOS Research Ltd.

Circle 83 on card.



Dust Collector

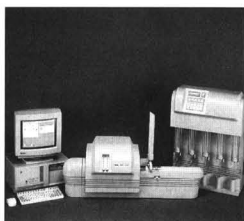
New Kemper 7000 Cartridge smoke, fume and dedicated source pulse jet dust collector includes as standard equipment a 1178 CFM balanced fan powered by a 1.5 kW, 2 H.P. dual voltage motor, 7, 10, Or 13 footby six inch diameter 360 degree flexible exhaust arms. Unit can be supplied with one or two arms. Also includes an electronic filter performance monitor, gortex light pulse, built in timer and a rotating nozzle that distributes compressed air the entire length of the filter cartridge. Available in either portable or overhead versions.

E.W.S. Group Inc.

Circle 84 on card.

Organic Halide Analyzer Accessory

New auto sampler accessory for the DX-2000 Organic Halide Analyzer allows unattended automatic injection of EOX (extractable organic halide) or TX (total halide) samples directly into the boat of the analyzer. The auto



sampler has 50 positions for 1.5 ml sample vials and is controlled through Windows™ based program of the DX-2000.

Dohrmann Division of Rosemount Analytical Inc.

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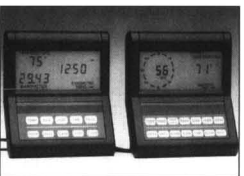


Leak Detection Device

S20 Surveyor is a portable belt-mounted acoustic listening device for detecting and pinpointing leaks on distribution systems. Utilizes two methods of leak detection. The rare earth magnet provides direct sensor contact to metallic surfaces such as valve operating nuts, curb stops and hydrants. Probe rod and wave guide sets allow the second method of monitoring for contact points that are buried or under water. Amplified leak noise is displayed on a digital LCD monitor.

Fluid Conservation Systems

Circle 86 on card.



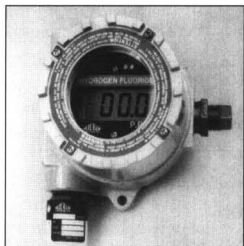
Weather Monitoring Station

Weather station available in three models. Indoor environmental monitors indoor temperature, humidity and barometric pressure. Indoor/

outdoor and deluxe indoor/outdoor weather models add outdoor temperature, humidity, barometric pressure, wind speed, direction and chill.

Cole-Parmer Instrument Co.

Circle 87 on card.



Gas Detection Transmitter

The explosion-proof Model Tox-Array 4-20 mA gas detection transmitter uses Mil-Ram's sensor technology to eliminate false alarms. Chemically selective sensors do not react with air, are not sensitive to changes in temperature, humidity or pressure and remain operative when gas is absent. Recovery is less than 15 minutes even when exposed to high gas levels.

Mil-Ram Technology Inc.

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Industrial Vacuum Cleaner

The Nilfisk GS 82 is an industrial vacuum with a 12-gallon capacity. It can be equipped with 1-1/2" or 2" nozzles or brush attachments, including a curved brush for overhead pipes up to 24" in diameter, wall nozzles and an angled brush that fits into corners. Non-conductive, etronite extension wands vacuum hard-to-reach areas. Optional HEPA (high efficiency particulate air), filter contains particles down to 0.3 microns in size.

Nilfisk

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PRODUCT LITERATURE



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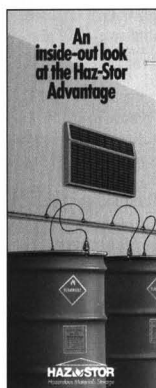


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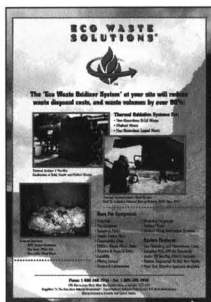


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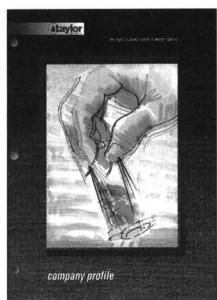


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Low Cost Data Acquisition

The Low-Cost DAQ brochure features all of National Instruments' low-cost data acquisition products. The four page brochure describes each low-cost product and lists the product's price and part number in order to facilitate ordering. Vivid images easily identify each of the low-cost DAQ products.

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The City of Phoenix is accepting resumes for two temporary positions with benefits. These positions will administer the City's \$4.5 million Lead-Based Paint Hazard Control Grant from H.U.D.

Lead Paint Program Coordinator \$43,014 - \$61,048

The Lead Paint Program Coordinator will coordinate and direct complex interdisciplinary program involving housing rehabilitation, public health and environmental management. The Coordinator will manage activities and personnel in the implementation and completion of a three year demonstration lead-based paint hazard reduction program for private housing, including program development/management, intergovernmental coordination, design for remediation, environmental compliance, legal/contractual procedures, and budgeting.

Minimum requirements include a bachelor's degree in Public or Business Administration, Urban Planning, or a related field, as well as five years of experience in program development at a level which required supervision or participation in the planning and programming processes. Other combinations of experience and education that meet the minimum requirements may be substituted.

Project Administrator \$38,917 - \$55,224

The Project Administrator position will be available within six months. Individual will coordinate and direct all activities and personnel involved in the implementation and completion of projects including, but not limited to: risk assessment, design and construction, worker safety, bidding and contracting, legal procedures, and budget and construction compliance.

Minimum requirements include a bachelor's degree in Industrial Hygiene, Public Administration, or a related field, as well as four years of responsible experience in program administration at a level which required supervision or participation in the planning and programming processes. Other combinations of experience and education that meet the minimum requirements may be substituted.

If interested in either of the above positions, please submit a cover letter and resume no later than June 10, 1995, to: O. Cortes, Personnel Analyst, Neighborhood Services Department, 200 W. Washington, 4th Floor, Phoenix, AZ 85003, Fax (602) 534-1555.

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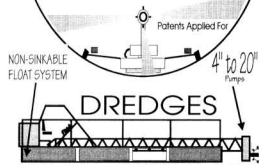
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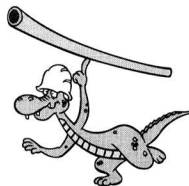
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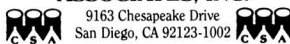
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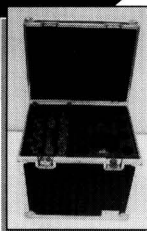
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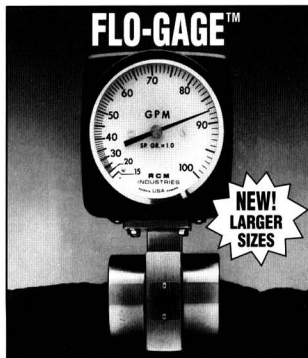
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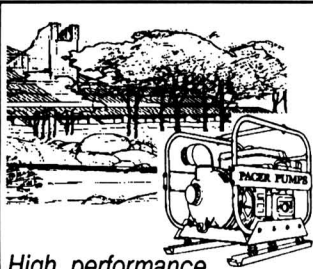
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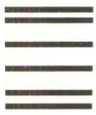
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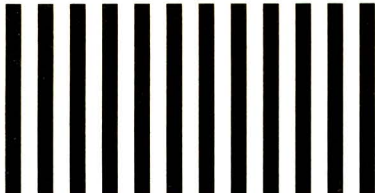
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NAME _____

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ADDRESS _____ Home Bus.

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- YES, I would like to receive/continue to receive Environmental Protection.
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1. Function which best describes your activity in Pollution Control (check only one):

- A Corporate responsibility for Pollution Control
- B Manage all Pollution Control Operations at this location
- C Supervise sub-group in Pollution Control Operations
- D Provide professional consulting service on Pollution Control
- E Provide staff environmental service on Pollution Control
- Z Other (please specify) _____

2. Type of Business (check only one):

A Manufacturing. If manufacturing, please check the appropriate SIC (check only one):

- | | |
|--|--|
| <input type="checkbox"/> (20) Food | <input type="checkbox"/> (30) Rubber/Plastic |
| <input type="checkbox"/> (21) Tobacco | <input type="checkbox"/> (31) Leather |
| <input type="checkbox"/> (22) Textile | <input type="checkbox"/> (32) Stone/Clay/Glass |
| <input type="checkbox"/> (23) Apparel | <input type="checkbox"/> (33) Primary Metal |
| <input type="checkbox"/> (24) Lumber & Wood | <input type="checkbox"/> (34) Fab. Metal |
| <input type="checkbox"/> (25) Furniture | <input type="checkbox"/> (35) Mach., except Elect. |
| <input type="checkbox"/> (26) Paper | <input type="checkbox"/> (36) Elect. & Electron. Mach. |
| <input type="checkbox"/> (27) Print/Publish | <input type="checkbox"/> (37) Trans. Equip. |
| <input type="checkbox"/> (28) Chemicals | <input type="checkbox"/> (38) Instru/meas/analyz/controlling |
| <input type="checkbox"/> (29) Petrol. & Coal | <input type="checkbox"/> (39) Miscellaneous Mfg. |

- B Mining
- C Agriculture
- D Engineering & Contracting
- L Consulting
- M Insurance
- E Utilities, public, private & cooperative
- F Govt. including municipal or district sanitary water or wastewater trmnt. sys. or plants

Type of Govt:

- G City H County
- I State J Federal
- K Transportation
- N Labs O Training P Real Estate
- Z Misc. Services _____

(please specify)

3. Approximate number of employees at this address (check only one):

- A 1-19 E 250-499 H 1500-2499
- B 20-49 F 500-999 I 2500 and up
- C 50-99 G 1000-1499
- D 100-249

4. In your job function do you recommend, specify or purchase? (check all that apply):

- A Pollution Control Equipment
- B Instrumentation
- C Chemicals
- D Parts & equipment for maintenance operation and control
- E Services/Consulting
- F None of the above _____

(please specify)

5. What types of Pollution Control are you responsible for? (check all that apply):

- A Air F Toxic & hazardous material
- B Water G Energy control/energy conservation
- C Noise H None of the above
- D Solid waste disposal
- E Industrial hygiene _____

(please specify)

6. Which of the following publications do you receive personally addressed to you? (check all that apply):

- A Pollution Engineering
- B Environment Today
- C Hazmat World
- D Pollution Equipment News
- E The National Environmental Journal
- F Water Environment & Technology
- G None of the above _____

(please specify)



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