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OCTOBER 1995

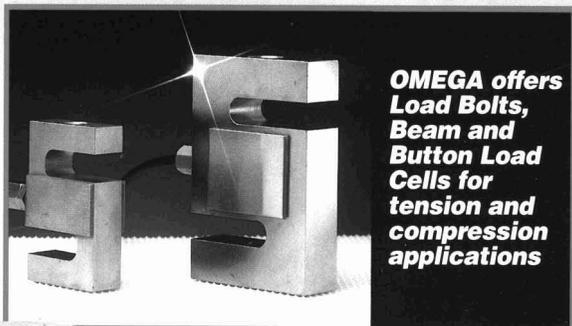
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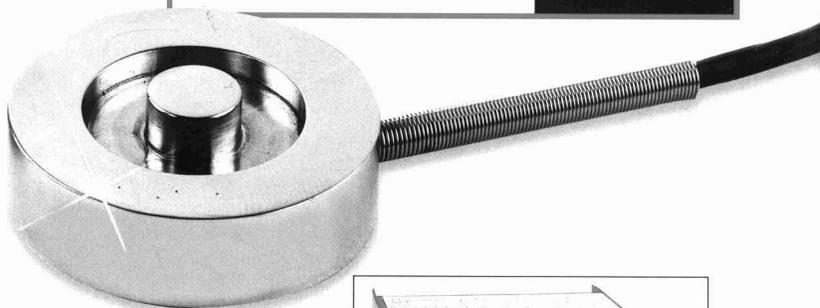
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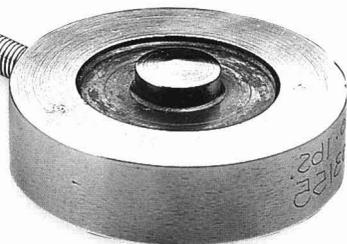
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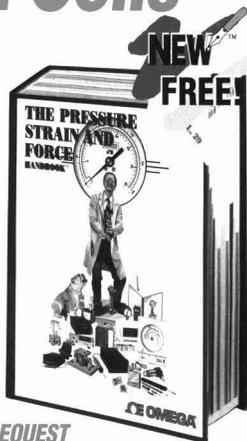
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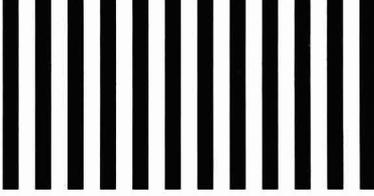
- A Air F Toxic & hazardous materials
 B Water G Energy control/energy conservation
 C Noises H None of the above _____ (please specify)
 D Solid waste disposal
 E Industrial hygiene

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

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 E The National Environmental Journal
 F Water Environment & Technology
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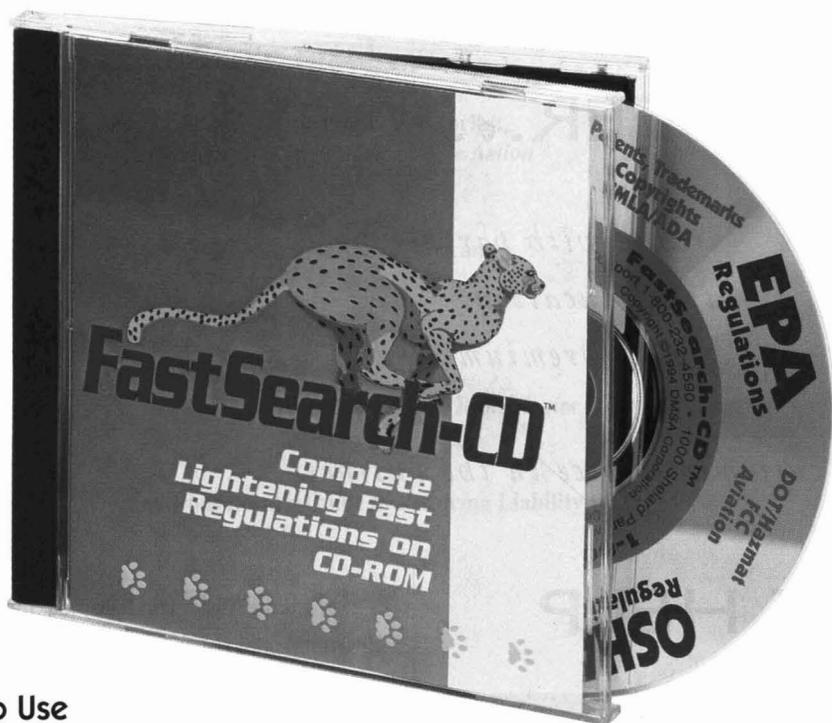
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Party Time



"May I have a party, Dad?"

I looked over the top of my newspaper to see my daughter Karen. "Sure sweetheart, but make sure to ask your Mother."

"I did, and she said I could invite six or 11 girls," Karen answered.

"That's nice," I replied going back to my newspaper and thinking it was unusual spread of numbers.

"Maybe, I should invite a few more, and we can cook hot dogs and hamburgers outside on the grill and watch videos later."

"That's nice," I answered becoming a little fidgety about vagueness of the numbers.

"And best of all, we'll have a sleepover, too," Karen exclaimed.

At the sound of the words "sleepover," perspiration broke out on my forehead and began running down my face. My hands began to tremble, and my legs became water.

There is little doubt among most parents that many years ago aliens landed on this planet and implanted the idea in all young girls' minds that sleepovers are fun for the family. In truth there will be no sleep, and all participants know that from the start. There is mandatory giggling, screaming, running up and down stairs, slamming doors, turning lights on and off but no sleeping.

"Maybe I'll invite lots of girls, so we can have more fun," Karen screamed with glee.

By then, I was blurry-eyed looking around the room for the telephone so that the emergency squad could rescue me from this fate worse than death. What the situation desperately needed was risk management. In this issue of *EP*, we focus on risk management. It is a hot topic that is rapidly growing in interest, particularly among governmental agencies.

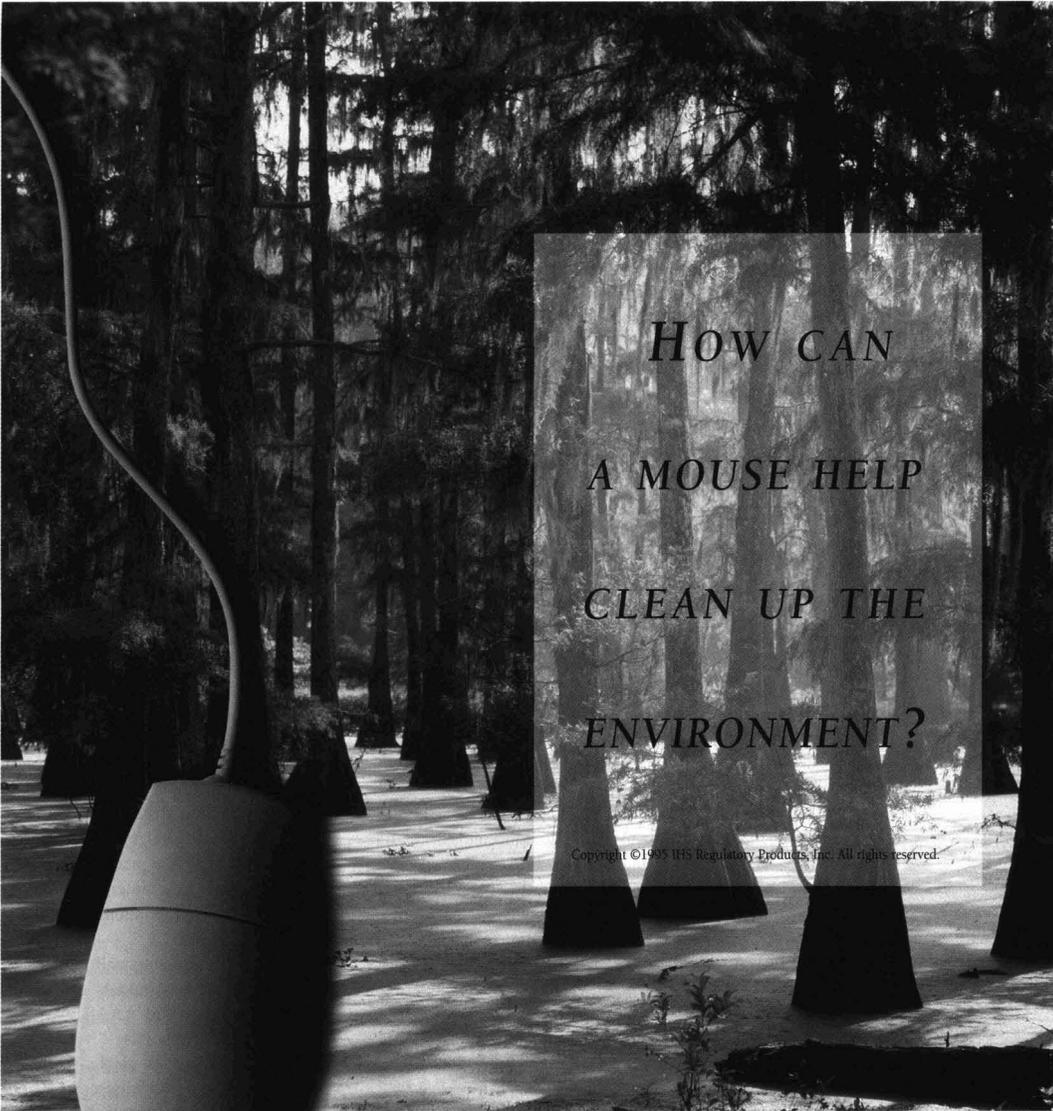
And speaking of risky management, USEPA recently held a meeting for all of the state environmental administrators. EPA Administrator Carol Browner finally decided it was time to meet with all of the state agencies to understand what their problems were and how Washington could help.

As I vaguely recall, her bosses Bill and Al had promised they would call such a meeting if elected. That was while they were campaigning, more than two and a half years ago. Obviously, it is never too late to have a "family" gathering. The question really is, what will it accomplish?

Carol used to run Florida's environmental agency and certainly implied during her confirmation hearings that she knew and understood the problems of the state regulators. So why wait until the Presidential race starts to heat up before getting back to campaign promises? A cynic might answer that she couldn't find the telephone numbers.

Special Note to EPA Administrator Carol Browner: There's still a lot of time to get things done, so if you need some phone numbers, give me a call.

Dick Young
EP Publisher



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GOP Agenda Doesn't Include Environment

Republican congressional leaders have unveiled their fall agenda, and environmental issues are conspicuously absent.

Senate Majority Leader Robert Dole (R-Kan.) and House Speaker Newt Gingrich (R-Ga.) told a press conference last month that the budget, Medicare, welfare reform and cutting taxes are their top priorities.

Following the press conference, Senate Majority Whip Trent Lott (R-Miss.) said the controversial "riders" attached to the House appropriations bill wouldn't make it through the Senate intact. "We'll work through those [and] take some and throw some away," he said. The riders, some of which would alter environmental policy, survived on a 210-210 vote in the House (see the September *Environmental Protection* news update).

Meanwhile, one bill with environmental ramifications that may see action soon is S 343, Dole's regulatory reform bill, which would subject rules to cost-benefit analyses. Lott said that bill would come before the Senate for a vote one more time. It was defeated on three procedural votes in July, having failed to muster the 60 votes needed to break a filibuster. At last count, the Republicans had 58 or 59 votes on their side to pass the measure.

But no such action is imminent in the Senate for a raft of other environmental legislation – including Superfund, takings, clean air, endangered species and clean water – which appear to be on the GOP's back burner for now. "I don't believe those are listed on the agenda for the next couple months," Lott said, acknowledging that they may not see action until after the Christmas break.

But Lott was careful to note that if the budgetary priorities are addressed and the other major bills are passed, there could be time to take up environmental bills in calendar 1995. "It depends on what we accomplish. I'm not saying we can't do it," Lott said.

Faucet Makers Agree To Get The Lead Out

Seven major faucet manufacturers agreed to reduce the amount of lead in their faucets and place warning labels on faucets that still leach lead, as part of a settlement of two separate lawsuits.

One of the suits was filed by the Natural Resources Defense Council and the Environmental Law Foundation, and the other by the California Attorney General's

office. Eleven major faucet manufacturers were sued, and four have not settled. The seven who did, Masco, Moen, American Standard, Eljer, Elkay, Universal Rundle and Whirlpool, agreed to a lead reduction plan to comply with California Proposition 65, which includes the strictest lead standard in the nation.

The agreement is enforceable only in California, but most of the companies agreed to comply with the settlement terms nationally. The four manufacturers in the case that did not settle are Price-Pfister, Chicago Faucet Co., Kohler Co. and Sterling Plumbing Group.

"For the first time, people will be able to choose between faucets with or without lead. This is an important step in the war on lead poisoning in the United States because we [NRDC] believe that faucets are one of the most significant sources of lead in drinking water." NRDC attorney Erik Olson said. According to EPA, lead in drinking water contributes 20 percent of the average person's lead exposure.

Report Calls Chemical Accident Danger Widespread

Chemical accidents at industrial facilities pose a serious danger to at least 45 million Americans and to the surrounding environment, the U.S. Public Interest Research Group and the National Environmental Law Center said in their August report "Nowhere to Hide."

U.S. chemical facilities reported over 34,500 toxic chemical accidents between 1988-1992, one in 16 of which was serious enough to result in injuries, evacuations or death. Texas, California, Ohio, Illinois, Louisiana, Pennsylvania, Michigan, New York, Indiana and Georgia account for over half the accident potential in the country, the groups said.

Chemical accidents produce a toxic cloud and often a release to waterways and land. Accidents can be difficult to contain, as toxic clouds can travel up to one mile in 17.6 minutes, but facilities often take up to 20 minutes to detect accidental releases and up to an hour to notify authorities and the public, the report said. In the short term, accidental chemical releases may kill fish and wildlife, disrupt drinking water systems and cause human illnesses. Long-term effects include tumors, reproductive dysfunction, other diseases in fish and wildlife, and concentration of the pollutants in the food chain from fish to humans. Large-scale chemical producers and users pose the greatest worst-case dis-

aster potential, the report states. The Great Lakes region illustrates the adverse impacts of toxic chemical accidents. Chemical dumping in the region has caused reproductive dysfunction in some waterfowl species, unusually high cancer rates in humans and contamination of many species of fish to the point that they are uneatable. EPA reported that accidental releases are one of the five main sources of indirect loading of persistent toxic chemicals into the Lakes.

Science Group Issues Warning On Budget Cuts

A top science organization has called on Congress to think twice before finalizing cuts in basic environmental science, arguing that federal support for such study is vital and pays dividends in the long run.

The American Association for the Advancement of Science criticized House budget cuts in environmental research at EPA, the Department of Interior, the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration.

AAAS, the world's largest federation of scientists, warned that such cuts would slow research over decades and delay or prevent environmental breakthroughs in the future. The findings were released Aug. 29 in a study titled, "Interim Report on Congressional Appropriations for R&D in FY 1996."

"Science advances in small increments, which rest on the shoulders of all preceding research," said AAAS executive officer Richard Nicholson. "Nobody can look into the future and predict the potential outcome of scientific research... The impact of decreases [in spending] of this magnitude will never be fully understood."

The House spending bills passed this summer would cut federal R&D overall by 33 percent, AAAS estimated. Except for the National Institutes of Health, all of the major civilian R&D agencies would face unprecedented cuts, the group found.

Other States' Waste Qualifies For Wisconsin

Out-of-state communities do not have to meet certain recycling program criteria to qualify their solid waste for disposal in Wisconsin landfills, a federal appeals court ruled Aug. 23.

In December, a federal district court ruled Wisconsin could require "effective recycling programs" for entire out-of-state communities before permitting any hauler

servicing that community to take waste into Wisconsin for disposal. But the appeals court found the provision violates the U.S. Constitution's commerce clause. The court said the provision imposes requirements of Wisconsin law on waste generators who neither reside nor dispose of their waste in Wisconsin.

"Out-of-state waste generators who do not dump in Wisconsin but who are located in communities adhering to Wisconsin's 'effective recycling program' must therefore bear the costs of complying with the Wisconsin law while their competitors in non-effective recycling communities, who may be dumping solid waste at the very same non-Wisconsin landfill, do not," the court said. In fact, approximately 80 percent of the out-of-state waste that was subject to the Wisconsin law was destined for non-Wisconsin landfills, the court said.

Waste Management Inc., which operates three of the 12 Wisconsin landfills that received waste from out-of-state sources before the December decision, expects those waste flows to return in the wake of the appeals court decision, said Lynn Morgan, manager of government affairs for the company's Midwest office. "The Wisconsin law had a simple procedural flaw - it applied to all waste generators in out-of-state communities, regardless of whether they send waste to Wisconsin," Morgan said.

Wisconsin has not decided whether it will appeal the decision to the Supreme Court, the attorney for the state Justice Department said.

Study Reports Mixed Results On Environmental Racism

Minorities and low-income populations are not overrepresented near most of the nation's municipal solid waste landfills, Congress' auditing agency said in a recent study. However, no such clear conclusions can be drawn from existing information on populations near hazardous waste facilities, the General Accounting Office said in the report.

GAO estimated that for 73 percent of metropolitan landfills, the percentage of minorities living within one mile was lower than the percentage of minorities in the national population. As for nonmetropolitan landfills, 63 percent had a lower percentage of minorities living within one mile than in the remainder of the country, GAO said.

Approximately 54 percent of populations within one mile of the metropolitan

landfills had median household incomes that were higher than the median national income, GAO said. Similarly, median incomes were higher than the national median for 52 percent of populations within one mile of nonmetropolitan landfills.

The data on nonhazardous municipal landfills were derived from 1990 census information at 190 metropolitan and 105 nonmetropolitan facilities. EPA considers the nation's 5,300 municipal solid waste landfills a "small, relatively low risk seg-

ment" of the 47,000 waste disposal sites around the country, GAO said.

Drinking Water Goals May Be Loosened In California

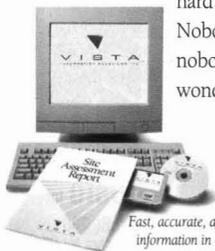
The California Assembly approved a bill that would remove health goals for drinking water contaminants. The bill, SB 1307, would repeal a major requirement of the 1991 California Safe Drinking Water Plan, authorized by California Assemblyman Byron Sher, D-Stanford. Senator Charles Calderon, D-Montebello, sponsored the bill,



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which passed the 80-seat Assembly Sept. 6 by a vote of 41-26. The Senate, which passed a different version of the bill earlier this year, will vote on it next.

If the Senate approves the bill, water agencies would no longer be required to pursue "recommended public health goals" for drinking water contaminants established by California state law. Instead, water agencies would be compelled only to meet the less stringent federal standards. Cost-based criteria would replace the health-based criteria currently used by California-specific drinking water standards.

The Alliance for Responsible Water Policy, which consists of local drinking water agencies, the League of California Cities, the County Supervisors Association of California, and the Chamber of Commerce, is backing the bill. The alliance said the bill would not threaten public health. "This legislation does not diminish any of the state's current standards, which are considered the most stringent in the world. What it does do is eradicate water quality 'goals' that are in most cases not only technologically infea-

sible, but are unnecessary and costly," John Gaston, chairman of the alliance, said.

Clinton, Gore Laud Reinvention Effort

Two years after its inception, the Clinton Administration's initiative to "reinvent government" is well on its way to cutting the fat out of the federal bureaucracy such as EPA, President Clinton and Vice President Al Gore told a White House audience Sept. 7. The program, which aims to change agency operations and eliminate needless regulations, has saved taxpayers \$58 billion, cut 160,000 employees from the federal payroll and laid the foundation for an additional \$46 billion in savings, Clinton said.

Gore, who spearheads the reinventing government program as part of his National Performance Review, said the effort is a "full year ahead of schedule." By 1999, the program should achieve \$108 billion in taxpayer savings and cut 252,000 federal jobs, he added.

In his two-year progress report to Clinton, Gore codified several recent rec-

ommendations for reforming EPA. The agency should consolidate Clean Water Act And Safe Drinking Water Act revolving funds, the report said.

Faircloth To Introduce Clean Air Legislation

Sen. Lauch Faircloth (R-N.C.) plans to introduce legislation soon to reform rules in the Clean Air Act.

No exact timeline exists for the initiative, a "technical corrections bill" for which a "broad range" of legislation is being considered for inclusion, said Sean Callinicos, staff director of the Senate Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety, which Faircloth chairs. Callinicos singled out the federal operating permit program, emissions testing, mandatory employee car-pooling, and EPA's ability to impose sanctions on states that don't comply with state implementation plans and ozone nonattainment guidelines as provisions that Faircloth's bill would affect.

"We're hearing from some conservatives, 'Don't touch the act, let the political

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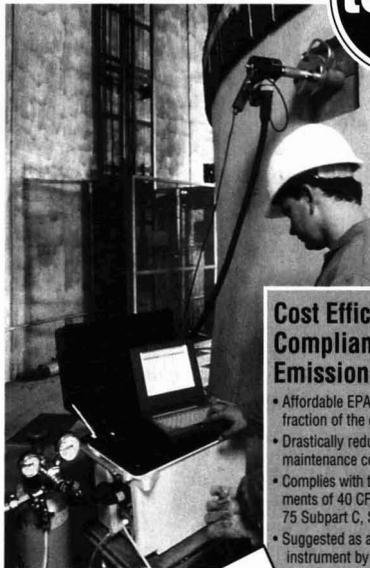
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pressure build up, let the public perception build up that this act is unworkable," he said. "But if you address the pressure points of the act in a narrow, short corrections bill, that will take a lot of pressure off the act as a whole and people will move onto other issues like clean water and safe drinking water."

Faircloth's subcommittee and the House Subcommittee on Oversight and Investigations, both of which staged hearings on CAAA in recent months, will continue scrutinizing the act. Their goal is to learn enough based on testimony from industry, environmentalists and citizens so legislation can eventually be crafted to reform parts of CAAA. Rep. Joe Barton (R-Texas), chairman of the Oversight and Investigations subcommittee, has said several times that the House will consider a bill to reform the act.

Endangered Species Act Bill Makes Appearance

A bill has emerged in the House that would rewrite the Endangered Species Act of 1973 by providing incentives such as tax

credits for landowners to protect endangered species' habitat and compensating landowners when restrictions imposed by ESA diminish the value of their property.

Rep. Richard Pombo (R-Calif.) introduced the bill Sept. 7. The proposed legislation would create a clearer distinction between threatened and endangered species, require more scientific data in making such distinctions, include captive-bred populations in species counts, create a National Biological Diversity Reserve system for protecting habitat, require that ESA not preempt other federal laws and make other changes.

"The Endangered Species Act does not work because [landowners] frequently act to eliminate habitat, for fear of losing use of their property to federal government regulations," Pombo said.

Businesses quickly lined up to support Pombo's bill. "This bill is good for both species and people," said a joint statement released by the National Endangered Species Act Reform Coalition and the Endangered Species Coordinating Council – members of which include a wide variety

of business groups representing agribusinesses, water districts and timber companies. The Pombo measure "is an important milestone in the 22-year history of the Endangered Species Act. It promises true reform of the law while maintaining its essential purpose of protecting and recovering endangered species."

But environmentalists wasted no time in decrying it. The Environmental Defense Fund said the bill would risk having sea turtles drown in shrimp nets, weaken American powers to influence species protection in other countries and end ESA protection for some high-profile species here – bald eagles, salmon in the Pacific Northwest, grizzly bears, brown pelicans and gray wolves – absent additional action by Congress.

Streamlined Title V Proposed By EPA

Major source facilities could automatically include minor new source review permits with a full operating permit without needing separate state approval for each minor change, under an EPA proposal pub-

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lished in the Aug. 31 *Federal Register*.

The agency's move would streamline what has become a drawn-out and costly process for major stationary sources, which were previously required under Title V of the Clean Air Act Amendments of 1990 to submit all NSR reconstruction permits for separate state review. Major sources, which are capable of emitting 100 tons annually of a combination of Hazardous Air Pollutants (HAPs) or 25 tons annually of one HAP, need NSR permits for new and modified units and pro-

jected emission increases.

"Once facilities get a new source review permit, they can staple it onto the back of their Title V permit," said Ray Vogel, an environmental engineer in EPA's Operating Permit Group. "They will no longer have the delay caused by the Title V process." In all, the new rule will save state officials "thousands of permit review hours" and industry about \$600 million in compliance costs, EPA said. A 60-day public comment period started Aug. 31.

"This is a huge step forward in reducing

unnecessary paperwork delays and bureaucracy," said Tim Mohin, government affairs manager for environment, health and safety at semiconductor-maker Intel Corp.

Mohin, however, sounded what he called "cautionary notes" before becoming too excited about the revised NSR policy. Environmental groups could initiate legal challenges, and the proposal is only a supplement to the final Title V rule from July 1992 and does not replace EPA's other supplements from August 1994 and April 1995, he said. "It's sort of cautious optimism — how do all the pieces fit together?" Mohin said.

Manganese Remains On TRI Reporting List

EPA has denied the American Iron and Steel Institute's (AISI) petition to delete manganese and manganese compounds contained in iron-making and carbon-steel-making slags from the Toxics Release Inventory.

TRI requires owners and operators of certain facilities that manufacture, process or otherwise use listed toxic chemicals to inform the public of the release of these chemicals annually. EPA denied the petition based upon its conclusions that manganese and manganese compounds in slags are toxic enough to merit continued reporting requirements.

"The American Iron and Steel Institute believes that manganese compounds in iron-making slags and carbon-steel-making slags do not pose a significant threat to human health and the environment," AISI said in its petition to the EPA. "Exposures from slags are so low that they approach, and in some cases [are] below, background levels in the environment.... Slags are virtually innocuous and present little or no risk to living organisms and the environment." Because of the tightly bound nature of the manganese slag, it is relatively inert and presents no significant threat to human health or the environment, AISI said.

But EPA studies contradicted AISI's basic arguments for taking manganese-slag off the TRI. EPA claimed that manganese levels in leachate from slags reported in the petition exceed those found in most natural fresh waters. Acidic and reducing environments could also change the manganese oxide to water soluble manganese ions, allowing it to enter groundwater supplies and reach surface waters. The manganese ion also is moderately toxic to aquatic and terrestrial organisms. **EP**

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Changing Goals in Environmental Training

THE TRADITIONAL ROLE OF ENVIRONMENTAL, HEALTH and Safety (EHS) Trainers has been to present technical EHS topics, such as Hazardous Waste Disposal, Hazard Communication, and HAZWOPER. Most conventional EHS training is not designed to change behavior; it is designed simply to update individuals and to provide information and concepts. Training is often developed and delivered by EHS professionals who have

been given the added responsibility of training.

Unfortunately, many EHS professionals are not trained in effective design and implementation of training materials. The assumption has been that as long as you know the technical information you can explain it. This is no longer true. The EHS training function now relies more upon professional trainers developing experience in EHS areas and working in conjunction with or reporting directly

to EHS departments.

With continued organizational downsizing and re-engineering, EHS training has begun focusing on accomplishing more, in less time, with fewer resources while continuing to meet governmental regulatory standards. Many EHS trainers are now held accountable for delivering measurable results through training. A major facet in this added responsibility is the recognition that professional EHS trainers must function as change agents and not simply as information providers.

In the past, organizational change activities have often come under the purview of Human Resources and Organizational Development specialists. This is no longer the case. EHS trainers find themselves going beyond simply focusing on introducing technical knowledge and concepts and are playing a major role in changing attitudes and beliefs, awareness and sensibilities, and skills and capabilities. It's important in these competitive times, as businesses strive for increased quality and excellence, to recognize the EHS training professional's role in helping set the tone for management.

"Crosslinking"

How can trainers encourage the development of not just new capacities, but of fundamental shifts of mind, both

individually and collectively?

As EHS trainers, we have all observed that "training" employees, according to regulatory definitions, does not ensure compliance with regulations or an adherence to long-term goals such as pollution prevention.

So why doesn't training which meets federal standards always work? One part of the problem is that EHS training that is designed to meet only the letter of the regulations is based on the wrong criteria. Traditional classroom training, dictated by management or regulatory agencies, has frequently been based on a hierarchical philosophy: management knows best, do as you're told, same training for everyone. In today's environment of self-directed teams, cross-functional tasks and personal growth, this doesn't work.

Training should "crosslink" the goals of the site, facility and culture where it is being applied. Trainers should work with a team to link learning with core competencies as well as user "needs." Needs assessments and program design should take in the goals of the management and the requirements of line managers. Course content needs to be jointly developed by the users and trainers. The intent is to increase learning through real-life examples.

These crosslink changes do not and will not happen rapidly and are often difficult to pinpoint or measure, but they are becoming an intrinsic part of EHS training programs. A factor which will contribute significantly to the success of these "new age" training programs is to change the approach from traditional training methodologies and to move toward a process involving facilitated learning. What are the differences?

Traditional vs. "Facilitated"

Traditional training involves employees receiving knowledge or skills training based upon regulatory requirements and often addresses either immediate need or short-term plans. Programs are instructor-driven using generalized content also developed by the trainer and are often prescriptive.

Facilitated learning involves providing employees with learning support coupled with lifelong development. The learning goals are based jointly on corporate strategies and user needs while focusing on core competencies and long-term strategic plans. Needs assess-

EHS trainers now find themselves playing a major role in changing attitudes and beliefs.

ments and program content are jointly developed with course participants and focus on providing experiential activities and meaningful workplace interventions.

Aiding in the facilitated learning process is the incorporation of adult learning principles. This helps to ensure that participants go through all stages of the adult learning cycle: experiencing, processing, generalizing and applying. Only when this cycle is operational do significant and enduring changes occur.

Both internal and external training experts can play a major role in finding ways to implement new ideas and programs through designing new tools and methods that assist "trainers" in developing facilitated learning programs. Trainers who see themselves as facilitators and coaches instead of instructors encourage independent learning through discussion, exercises, role playing and other forms of experiential learning. These activities must be directly applicable to the adult learners' experiences and work environment.

Most areas of technical training are cen-

tered on basic information employees need to know. For example: the specifics of how to complete hazardous waste labels and manifests; what materials can be safely used to suppress vapors during spills; and what personal protective equipment should be worn when working with a particular chemical. This information may best be taught by computers or self-directed programs.

But what about less straightforward subjects, such as discussion of why an accident occurred, the impact of disregard for safe handling of chemicals on the quality of the product or the safety of employees or how pollution prevention fits into the strategic plan of the company?

One example of the EHS training professional's new role might include the implementation of Accident Prevention Workshops. Accident prevention workshops are designed to work with people to change their workplace behavior and to function as "Peer Coaches" with co-workers. They entail the use of both traditional EHS training approaches as well

as proven Organization Development techniques. Through this combination of approaches, coupled with workplace reinforcement from management, a "facilitator" is able to influence individual thinking and action. This is done in such a manner as to achieve the desired outcomes based on the needs jointly identified by management and workers.

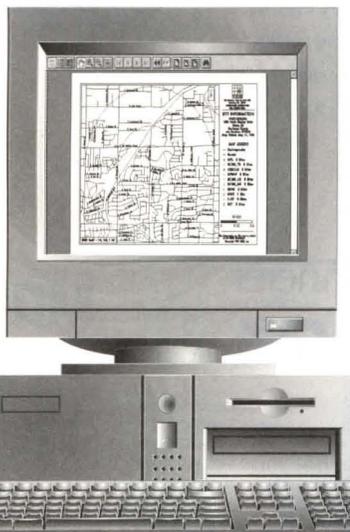
Together, a team of trainers, designers, trainees and line managers can create new programs that fit a company's culture and goals, create learning and growth opportunities, and promote inquiry and dialogue while meeting or exceeding regulatory guidelines. **ED**

Carol Kefford Eshelman is a certified environmental trainer and independent training consultant based in Baltimore. Craig Woodacre is a certified environmental trainer with Bristol-Myers Squibb at its Syracuse, N.Y. facility. Both are active members of the National Environmental Training Association.

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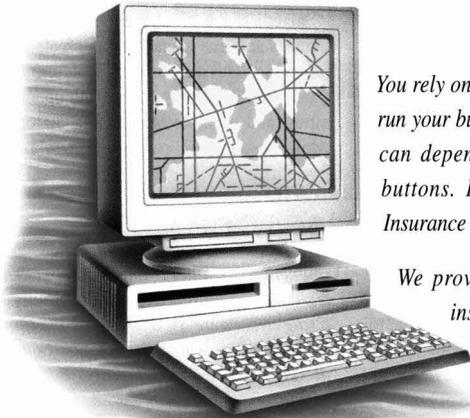
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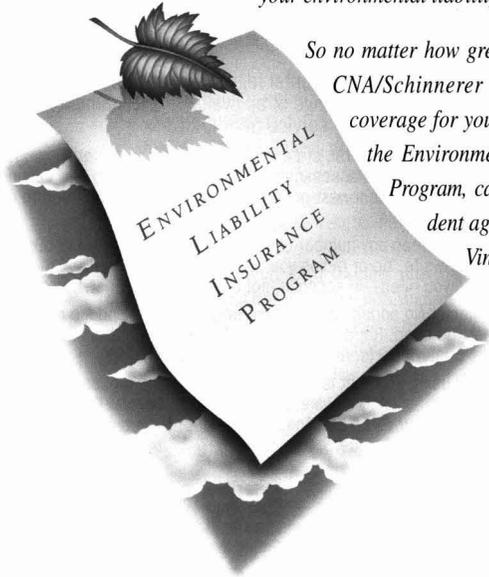
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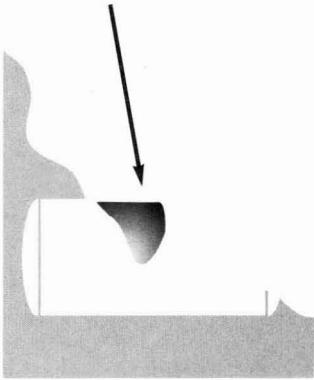


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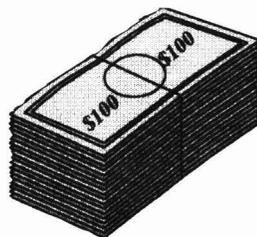
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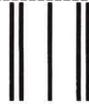
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Emission Credits: "Sell 'Em If You Got 'Em"

EPA CONTINUED A TREND TOWARD MARKET-BASED solutions to air pollution with its recent announcement of an Open Market Trading Rule. The idea is to get facilities that have emissions credits to sell them to companies that need them to comply with Clean Air Act requirements.

The proposed rule, which appeared in the August 3 *Federal Register*, is unique at the federal level in that it addresses ozone smog precursors – nitrogen oxides and

volatile organic compounds. Under the system, industrial sources can create credits by reducing emission rates below actual levels or levels required by federal or state rules. Then the companies can sell those credits, known as discrete emission reductions or DERs.

States would not have to approve the credits when they are created, only when the buyer uses them for compliance. As a guarantee that every emission trade will result in net

improvement in air quality, 10 percent of every trade amount must be retired by the source using credits for compliance, EPA said. The agency "believes that purchasers will more than make up the cost of the 10 percent difference in reduced pollution control equipment costs," EPA said in announcing the proposed rule.

EPA hopes the open market program can build on the success of other market-based programs, such as the allowance trading system for sulfur dioxide to control acid rain.

That program has turned out to cost a lot less than originally thought – \$2 billion annually instead of the original estimate of \$4 billion, according to EPA. That's because of lower scrubber costs, higher scrubber efficiency and dropping prices for low-sulfur coal, the agency said in its proposal. Meanwhile, in California, the Regional Clean Air Incentives Market, program is expected to cut emissions of NOx in southern California by 80 percent over 10 years while saving about \$58 million per year compared to traditional regulations.

Against this backdrop, EPA has taken a foray into the bold new world of open market trading. The agency had been working on the proposal for some time, but got a push when President Clinton and Vice President

Gore released their report on reinventing environmental regulation earlier this year.

States, Others Seek Changes

But while the proposal is "a good first step," there are some areas that could use improvement, said Shawn King, a senior environmental engineer with the Virginia Department of Environmental Quality. King, who worked on the proposal with EPA officials before they released it, said the proposed program is "too restrictive and prescriptive in some areas."

She and other state and industry representatives would like to see EPA loosen the rule a little to allow companies to accumulate DERs from production shutdowns and curtailments. She would also like to see EPA allow DERs to be used to comply with any air quality requirements. In the proposal, EPA said companies cannot use DERs to comply with a bevy of CAA requirements, including NSPS, MACT, BACT, LAER, various Title II mobile source requirements and Title IV acid rain requirements.

Five different utilities, including Pennsylvania Power & Light Co. and Niagara Mohawk Power Corp., also questioned the shutdown/curtailment provision. They "understand [EPA's] concern about the creation of DERs from shutdowns and curtailments where operations are simply increased elsewhere and there is no resulting emissions decrease." But, they said at a recent public hearing, "Often a source may shut down or curtail its operations and not shift production to another source."

Another concern, expressed at the public hearing on the proposal by a General Motors executive, was the "buyer beware" approach taken by EPA. DER users "are strictly liable under [CAA] Section 113 for compliance with applicable standards through use of DERs," the agency said in background materials on the proposal. "It shall not be a defense for compliance violations and penalties that the user relied on the generator's DERs in good faith."

That policy "exposes the user to a high level of risk," said GM's Dean Drake, adding that buyers "can be held liable if companies that generated the credits developed them fraudulently."

But King said she thought the "buyer beware" policy made sense. "People sign contracts every day," she said.

EPA hopes the open market program can build on the success of other market-based programs.



RISK ANALYSIS TESTING LABORATORIES

Reducing the Costs of Corrective Action

By Jeff Simms and Michael Taylor

The acquisition of highly-accurate data early in the corrective action process can be directly correlated to cost-effectively closing subsurface contamination sites. This commonly-held principle is evidenced by the number of states allowing for – and in many cases requiring – the use of accelerated site characterization. A number of tools have been introduced recently to speed and improve sample acquisition, as well as analyze data onsite, creating the opportunity for onsite decision making.

One such tool, the Risk Analysis Testing Laboratory (RATL), extends the opportunity for highly accurate data to be collected onsite during the exposure assessment and remediation feasibility stages of subsurface corrective action. The system is driven by onboard data acquisition and processing hardware and software that provides necessary site-specific information for determining potential exposure, prioritizing

sites and, if necessary, designing remediation systems onsite in one mobilization.

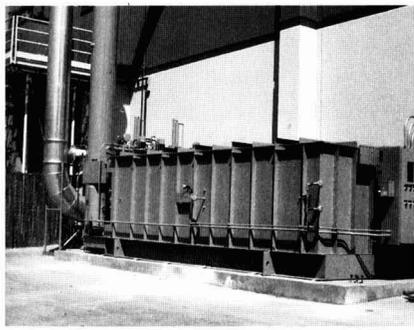
Risk Analysis

As more states and federal agencies adopt risk-based cleanup criteria, determining the risk of exposure to hazardous chemicals released in the subsurface becomes the means for establishing the “priority” of the site and the necessity for remediation. This procedure includes determining the size and location of a contaminant plume, the

rate at which it is moving through soil and groundwater, and whether or not natural degradation is occurring. It is currently considered to be a multi-phase process completed at considerable cost.

RATL provides the opportunity to conduct a complete exposure assessment onsite in one mobilization, thus eliminating multiple mobilization, reporting and consulting costs. In a recent case involving petroleum constituents in soil and groundwater, RATL first functioned as a mobile labora-

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Risk Analysis

tory with onboard gas chromatography capabilities. Used in conjunction with a narrow-diameter soil and groundwater sampling device, a complete constituent distribution assessment was accomplished.

Once the nature and extent of the plume was determined, field analytical tools were used to measure aerobic and anaerobic natural degradation indicator parameters. Then, the onboard data acquisition and data processing systems seamlessly delivered pump test data onsite to determine hydraulic conductivity. Combined with hydraulic gradient information – obtained by survey water level elevations through narrow-diameter points-groundwater velocity was provided onsite.

Because risk of exposure was determined to be greater than two years (a standard time frame recommended in ASTM's *Risk-Based Guide for Corrective Action*), the project manager determined onsite that the remedy should focus on source removal and that natural attenuation of the dissolved plume should be considered part of the final corrective action strategy.

Remediation Feasibility Testing

Developing a reliable data set of design criteria for remediation has been a time-consuming and sometimes difficult process. Utilizing pumps, blowers and gauges (carried in a milk crate or, at best, mounted on a trailer), remediation specialists must usually run from well to well recording readings during the test. Raw data is then manually processed back in the office. If gaps or anomalies are discovered in the data, which is common in dealing with variable subsurface conditions, project managers are left with the choice of either admitting that the feasibility test is flawed (and asking the client for more money to return to the field), or designing a system with insufficient or erroneous data. Re-remediation is becoming an increasingly common term in the remediation industry.

RATL provides a number of options for collection, processing and representing in table and graphic format the necessary parameters for designing pump-and-treat, soil vapor extraction, air sparge, dual phase extraction and bioventing systems onsite in real-time as the tests are being conducted. Test parameters, sampling locations and the type of test can be modified onsite.

Data is digitally collected during each type of test and is available for graphical and tabular observation throughout the tests. Data acquisition software collects

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and performs preliminary processing of the data during the course of the tests. The data is then transferred to individual worksheets for computation of key parameters and graphic images and output. Based upon the outcome of an individual test, measurement parameters can be modified. Flow, injection and extraction rates can be modified based on test results as provided onsite.

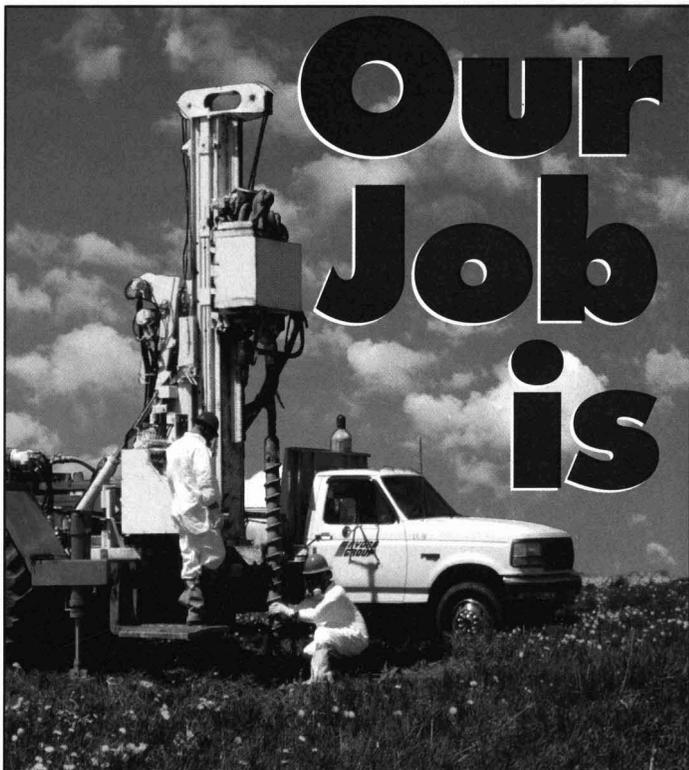
Used in conjunction with a modified, narrow-diameter drilling device, both extraction and measurement points can be added to measure areas outside the existing grid both vertically and laterally as design data is generated within the RATL system.

As a recent example, during an air sparge test, dissolved oxygen was measured in one point but not in another point equidistant from the injection point. In a conventional air sparge test, the project manager might try injecting more air or would be left to hypothesize away the anomaly.

In this case, additional points were added to the monitoring grid at different vertical depths. It was discovered that a thin silt lens not identified during the investigation was causing air to travel under the lens until it reached a release point beyond the existing monitoring and vapor extraction network. A potentially dangerous situation was avoided, and the lens was considered in the final remediation plan.

Thus, with the flexibility of modifying both the test grid and parameters to be measured, anomalies and shortcomings in the data can be eliminated, providing a much more accurate remediation design. In supervising the use of RATL to conduct a dual phase extraction test at one of his sites, Mark Steel, manager of Engineering Services for Unisys' Corp. Environmental Affairs said, "I was impressed with the timeliness, quality and quantity of data resulting from the direct integration of the software with the system's instrumentation. This data enabled us to obtain clear results and to accurately project those results into the design of a larger remedial system." **EP**

Both authors work with Land Tech Remedial of Monroe, Conn. Jeff Simms is senior project manager in the Maryland office and is responsible for managing the Risk Analysis Testing Program. Michael Taylor is vice president for corporate development at LTR's corporate headquarters and oversees several technical innovation programs.



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EPA'S RISK MANAGEMENT PROGRAM

Don't Ignore It

By David Heindl

Facility managers will have to contend with two major Clean Air Act compliance programs in the next few years: Title V and the Risk Management Program rule. Developed under the CAA's Section 112(r), the RMP rule is designed to reduce the risk of accidental releases of acutely toxic, flammable and explosive substances at more than 100,000 facilities across the country.

EPA first proposed the rule in October 1993, but numerous industry groups, states and other implementing agencies said EPA had underestimated the cost of the proposal. States in particular said that because the proposal would have applied to all companies that handle more than a certain amount of chemicals, the agencies responsible for implementing the proposal would find it more difficult to focus on companies that pose the most risk.

In response, EPA trimmed back the proposed requirements in a separate notice in March 1995. In March 1996, the agency plans to issue a final rule that would require compliance within three years. This means that if your facility has on-site threshold quantities of any of 77 acutely toxic, 63 flammable or Department of Transportation-classified explosive substances, you will need to establish a risk management program.

Even if your facility is not subject to the RMP rule, if you deal with acutely hazardous materials, the Clean Air Act's General Duty clause requires you to identify hazards, design and maintain safe facilities, and minimize the consequences of hazards present at your facility. A comprehensive RMP is one

way to ensure safe operation.

Risk management programs have three basic elements: hazard assessment, accident prevention, and emergency preparedness and response. Your RMP also must identify off-site risks associated with accidental releases. If any risks are found, you are required to establish programs that would either identify current practices addressing and mitigating those risks or improvements that would do so.

Risk Management Plans

In the RMP rule, EPA requires a Risk Management Plan that summarizes how your facility is complying with EPA's RMP requirements. It details methods and results of the hazard assessment, accident prevention, and emergency response programs instituted at the facility. The hazard assessment shows the area surrounding the facility and the population potentially affected by "worst-case" and more likely releases.

The Risk Management Plan should be comprehensive but easy to read, because it will be submitted not only to the implementing agency, but also to the Local Emergency Planning Commission. It also must be made available to the public.

In all, EPA forecasts about 123,000 facilities will have to comply with the RMP rule. A wide variety of industries will be affected, including manufacturers of chemicals, paper, petroleum-based products (including gasoline and plastics), as well as specialty gas producers. In addition, the following non-manufacturing companies will be affected by RMP: utilities, public drinking water and treatment works, cold storage facilities



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EPA's Risk Management Program

Tier 2 and 3 RMP Components

Hazards Assessment

- Analyze the circumstances and events that could result in releases of acutely hazardous substances
- Review documentation of past release(s)
- Identify worst-case and more likely release scenarios for each substance
- Evaluate potential off-site consequences of release scenarios for public health and environmental impacts

Prevention

- Evaluate safety precautions and management systems
- Establish and enforce standard operating procedures
- Institute employee safety training
- Evaluate control and mitigation systems
- Investigate and report accidents

Emergency Preparedness and Response

- Establish emergency response procedures for all employees
- Coordinate plans with Local Emergency Planning Committee
- Develop and test public notice procedures

Final Risk Management Plan

- Design comprehensive risk management program
- Develop procedures for management of change
- Establish incident investigation and reporting
- Schedule quality audits of programs
- Provide assistance with community outreach activities

which use ammonia and propane distributors.

For manufacturers already addressing process safety and risk management issues through OSHA's Process Safety Management rule, RMP essentially expands their program to include evaluations of off-site hazards. EPA plans to provide specialized guidance to help simplify the RMP process for elements of the non-manufacturing sector.

In its supplemental proposal, EPA proposed a tiered approach that would simplify requirements for most affected facilities. For example, EPA proposed defining Tier 1 facilities as those that can demonstrate they do not pose an off-site risk to their nearest neighbor or sensitive habitat. Tier 1 facilities would have to prepare "a brief RMP" demonstrating and certifying "that the source's worst-case release would not reach any public or environmental receptors of concern," according to the March 13 *Federal Register* notice. EPA estimates 49,200 facilities would qualify for Tier 1 status.

About 72,000 facilities would qualify for Tier 2, which would require a streamlined risk management program including description of the facility's five-year accident history, accident prevention steps, and an emergency response plan.

On the other hand, Tier 3 facilities would be required to comply fully with the RMP rule as originally proposed. Tier 3 facilities belong to specific industrial categories identified by EPA as historically accounting for most industrial accidents resulting in

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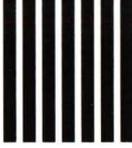
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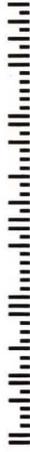


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off-site risk. These categories include pulp, plastics and resins, chloralkalis, industrial organic and inorganic chemicals, fertilizers and agricultural chemicals, and refineries. About 1,300 facilities would be in this category, according to EPA.

Public Response to the RMP

The component of the Risk Management Plan that is likely to spark the most public interest is the impact zone – the area surrounding the facility where, in the event of an accidental release, life, health, or sensitive ecological areas might be endangered. This would needlessly complicate emergency planning and the effectiveness of emergency response.

Conservative assumptions regarding the criteria for safe concentrations or unrealistic “worst-case” release scenarios can act to expand this potential impact area beyond which endangerment would occur.

Although EPA will provide simplified screening methods to estimate the maximum size of this zone, it is in your best interest (and the best interest of the neighboring

community and emergency responders) to have an accurate estimate of this area. Many facilities will have to perform a refined consequence analysis to characterize more accurately the release configuration, dispersion and transport, exposure, and related human health and ecological effects associated with an accidental release.

Because of public sensitivity about accidental releases and their potential effects, many companies are developing proactive communication programs to disseminate accurate information about their RMPs and potential hazards to the public, local officials, media and other interested parties. Industry experience with the extensive public response to the dissemination of SARA Title III toxic release information has shown the importance of effective communications concerning environmental risk. A communications program will help dispel misinformation and distrust and build good community relations.

RMP Technical Skills

To develop an effective RMP, a wide variety of technical and communication skills are

RMP Requirements

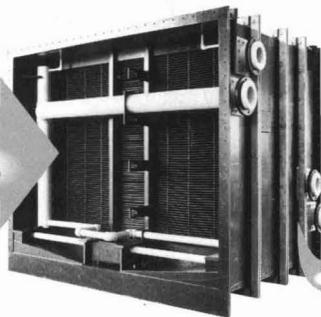
- **Tier 1:** Facilities will need only to register, certify that hazards will be contained on-site, post local caution signs, and report significant releases should they occur. (The EPA is in the process of developing simplified methods to determine impact zones to evaluate Tier 1 eligibility.)
- **Tier 2:** Facilities will need to implement a “streamlined” RMP. This category provides facilities with substantial flexibility to address the specific program elements. For example, you can cite existing accidental release programs and not necessarily have to develop new ones to be in compliance.
- **Tier 3:** These facilities, belonging to one of eight industrial classes, will be required to implement and document the full RMP rule (see box for RMP components).

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EPA's Risk Management Program

necessary. Chemical and mechanical engineers (for process safety and HAZOP), air quality scientists (for consequence assessment), toxicologists (for acute health effects), risk assessment specialists (for population exposure and environmental effects), and communications specialists (for risk communications) are the most common professional disciplines involved in a comprehensive RMP. Many companies with Tier 2 or 3 compliance requirements will need to seek the assistance of an experienced consultant for these specialized skills

to comply in a cost-effective and time-efficient manner.

RMP Cost

Because an RMP involves strategic decisions, it requires a top-down corporate commitment to minimize risks. A facility with a number of RMP elements already in place obviously will need to use fewer resources than a facility that is building a program from the ground up. The level of effort and need for expert assistance also depends on the size and complexity of the facility and the applic-

able requirements under the three-tier system. For example, a Tier 1 facility may complete RMP requirements with only a few weeks of effort, whereas a Tier 3 facility RMP may take a facility team, working with outside experts, several months to complete.

Prepare Now for RMP

The first step you can take is to determine, based on the promulgated list of acutely hazardous substances, whether your facility will be subject to the rule. Next, determine which tier applies to your facility and use this information to examine the feasibility of operational changes that could eliminate the need for the program altogether, or reduce RMP requirements, which will save you money. Here, an experienced consultant may be able to recommend several options available for your facility.

As part of Title V permit, you also need to begin to examine your facility's processes and work practices so that you can identify in advance any elements that are likely to require upgrading to comply with the RMP rule. This evaluation will also identify potential capital expenditures (i.e., emissions detection equipment) that you need to include in your operating budget. It may also be advantageous to study the potential scale of the off-site impact areas associated with an accidental release scenarios, as this information will influence the risk management planning process.

Final Note

The EPA's proposed RMP rule outlines a process for facilities to reduce risks associated with accidental releases. In most regulatory programs, the EPA has relied on compliance with prescriptive requirements. Through the tiered approach, the EPA is attempting to provide sufficient latitude for facilities to develop effective Risk Management Programs tailored to their individual situation. Your challenge will be to demonstrate to the implementing agency and the public sector, through your risk management plan, that appropriate measures are being taken to minimize risk and to do so cost-effectively. **EPA**

David Heinold is a senior technical specialist for Risk Management Planning at ENSR, an international environmental consulting, engineering and remediation firm. He has 17 years of experience helping companies evaluate off-site risks associated with releases of acutely toxic air pollutants.

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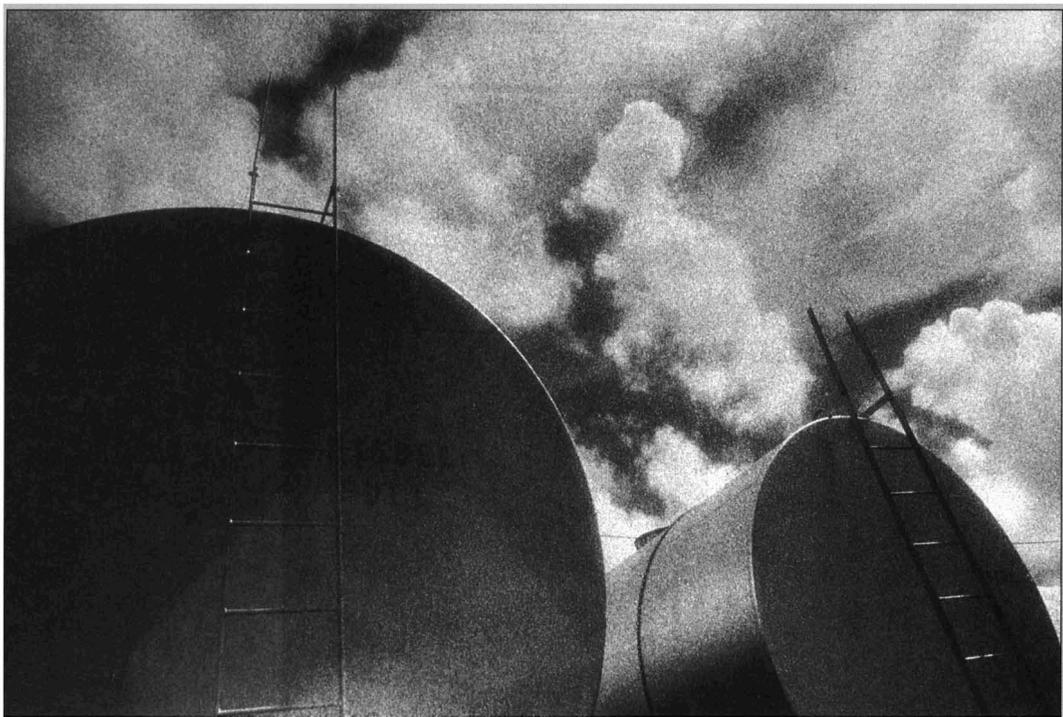
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LEAK DETECTION

A Review of Requirements and Technologies

By James Wolford

Detection of small leaks in large aboveground storage tanks is not only technically challenging but of critical environmental importance. Using the EPA's threshold criteria of .05 gallons per hour in a 10,000 gallon underground tank, the threshold would equate to a 15 gallon per hour detection level in an 80,000 barrel tank. Given the limited number of systems capable of meeting EPA's UST threshold, the challenge of detecting AST leaks a full magnitude below that rate must be seriously questioned and effectively substantiated. Mass measurement technology offers proven performance in detecting small leaks in ASTs. This proven technology in measuring the primary variable in question, the loss of mass

from the tank, is currently available in a system described herein.

Detection Needs

The primary application of AST leak detection systems can be broken down into five major categories.

- The use of accurate leak detection qualification methods to determine the existence of leaks and quantify the size of a suspected leak. Typically these tanks come under suspicion as a result of inventory inconsistencies, noted results of manual tank strapping or the presence of tank contents at or near the surface.

- The use of leak detection to classify and prioritize existing tanks with no known leak history for future repair. This involves an operator's need to establish the existence of any current leaks and therefore set priorities for bottom replacement and dou-

ble bottom installation projects.

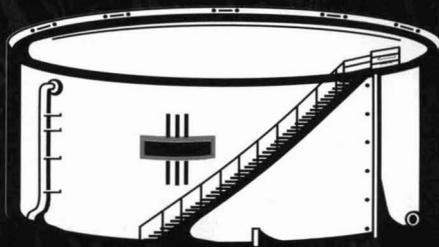
- Following tank repairs, which may require an operator to conduct a hydrostatic test, some operators conduct an accurate leak detection test and document the tanks containment integrity at the same time.

- Proactive companies taking the initiative to conduct accurate leak detection investigations on existing tank's. This initiative is often taken to protect the environment, avoid litigation, preempt regulations, reduce liabilities and maintain control of product inventories.

- Situations where regulation or company policy dictate leak detection testing.

Federal Regulatory Review

There is currently no single comprehensive federal regulatory program governing AST's. Outlined are four existing federal statutes and regulations that are applicable



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Leak Detection

An Alternative to Double Bottoms for ASTs

Many owners and operators of above-ground storage tanks are scheduling the purchase of new double-bottom tanks into their budgets. While the method substantially reduces the risk of leaks, one downside is the huge cost of replacing existing tanks.

Fortunately, new technology and a better understanding of why tanks leak provide an alternative to replacing single-bottom tanks.

State-of-the-art internal and external corrosion prevention systems and external leak detection systems provide close to zero risk of leaks at a fraction of the cost of tank replacement. Added benefits include lower maintenance expenses, longer tank life and reduced liability. Controlling corrosion eliminates more than 95% of leakage problems and early detection capability results in minimal remediation expenses in the event of a leak.

Horizontal Boring

An accurate and reliable procedure for horizontal boring that allows for installation of slotted pipe networks has been developed by Corrocon Inc., of Nederland, Colo. PVC pipe, up to three inches in diameter, can be installed horizontally from 18 inches to five feet beneath tank bottoms, depending on design requirements. The tanks do not have to be emptied or taken off-line during installation.

Once pipe networks are in place, they are used to install a leak prevention system. Should a leak occur, the networks can be used for remediating hydrocarbon and other

volatile organic compounds using soil vapor extraction technology.

Cathodic Protection

The usual first step where an existing cathodic protection system is thought to be protecting tank bottoms is a single boring to the center approximately 18-24 inches below the tank bottom. An accurate tank-to-soil potential profile is taken following API and NACE international standards. A replaceable reference cell, with an expected life of 15 to 20 years, can be placed under the center of the tank bottom.

If the tank soil potentials shows that existing cathodic protection systems are providing adequate coverage, operators can justify stretching API Standard 653 in-tank inspections to maximum recommended limits, thus saving time and money. If the corrosion evaluation shows that existing systems are inadequate, the second step is to install a complete cathodic protection system in efficient configurations determined by tank size, soil conditions and other design criteria. These may be either parallel placements or a "crow's foot" arrangement.

External Leak Detection

Tracer Research Corp., Tucson, AZ, has developed an Automatic Leak Detector (ALD) for USTs and ASTs and pipelines. An inert volatile chemical is introduced into the product. If the tracer chemical is detected outside of the system, it is leaking. The ALD continuously analyzes the vadose zone for hydrocarbons and tracers.

to most tank owners directly or indirectly in a weave of regulatory fabric. Most applicable for use as an AST standard would possibly be the RCRA guidelines, but they may not be suitable in all situations.

With the current state of affairs in AST regulation, it is expected that any new regulation and enforcement activities will be enacted at the state level. With numerous states having existing and/or pending regulations, effective review of each is not practical within the confines of this paper.

SPCC Plan

A Spill Prevention, Control and Countermeasures (SPCC) plan is required for any facility that may reasonably be considered to have the potential for the discharge of oil into or upon the navigable waters of the United States or adjoining shore lines, excluding facilities governed by the Department of Transportation.

Owners and operators of these facilities

are required to complete a review and evaluate the SPCC plan at least once every three years. As a result of this review the owner or operator may amend the plan to include more effective prevention and control technology if such technology will significantly reduce the likelihood of a spill, or if such technology has been field proven at the time of the review.

According to 40 CFR 112.7 (e) (vi) - ASTs should be subject to integrity testing, taking into account design (roof structure, etc.) and using such techniques as hydrostatic testing, visual inspection or a system of non-destructive shell thickness testing. Comparison records should be kept where appropriate. Tank supports and foundations should be included.

In the proposed revision II 40 CFR 112 - Requirements for Onshore facilities (Excluding Production Facilities) Above-ground tanks must be subject to integrity testing every ten years, and when material

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Leak Detection

repairs are performed, taking into account tank design using such techniques as hydrostatic testing, radiographic testing, visual inspection, ultrasonic inspection, acoustic emission testing or a system of non-destructive shell thickness. Comparison records must be kept and tank supports and foundations must be included.

RCRA Subtitle C

Under the Resource Conservation and Recovery Act, The operating requirements for tank systems fall into five categories: Tank Assessments; Secondary Containment and Release Detection; Operating and Maintenance Requirements; Response to Release; and Closure and Post-Closure requirements.

An assessment must be performed to evaluate the tank system's structural integrity and compatibility with the wastes it will hold. This assessment covers designing, corrosion, tank tests, waste characteristics and tank age.

The regulation also requires individuals using AST's either to store or treat hazardous waste to manage their tanks to avoid leaks, ruptures, spills and corrosion. Secondary containment and release detection are required.

EPA records as of February 1993 list 4,200 treatment, storage and disposal facilities, 20,800 transporters and 266,000 large and small generators that are subject to RCRA compliance. Refinery and chemical process facilities that store materials, manufacture products and generate by-products classified as hazardous waste are covered by the Act.

OSHA Chemical Process Safety

OSHA's process safety standard requires plant management to test and maintain the integrity of critical process equipment to ensure that listed chemicals are contained within the process and not released in an uncontrolled manner. OSHA defines critical process equipment as: pressure vessels and storage tanks; piping systems; relief and vent systems and devices; emergency shutdown systems; and controls (monitoring devices, sensors, alarms, etc.) and pumps.

Chemical processes covered by the OSHA standard must undergo audits every three years to verify the compliance with the standard's various requirements. The first round of compliance audits was due to be finished by May 26, 1995.

OSHA has given owners flexibility in maintaining their process equipment by adopting a performance-based approach

requiring that inspection and testing procedures follow recognized and generally accepted good engineering practices. Also, the frequency of inspections and tests of process equipment must be consistent with the applicable manufacturer recommendations and good engineering practices.

OPA 90

The Oil Pollution Act of 1990 was enacted to strengthen and consolidate section 311 of the Clean Water Act. Like the SPCC regulations, EPA's portion of OPA requires onshore and inland AST facilities to establish protocols and procedures to prevent and contain discharges of oil from non-transportation related facilities in or upon the navigable waters or adjoining shorelines of the United States.

Application of leak detection under this act is an applied application as the act implements and enforces sections of 40 CFR 112.20 and 112.21. Technical requirements in relationship to spill and discharge prevention (applicable sections of 40 CFR 112.) have been left out of OPA as they are not directly related to facility response plan requirements.

Compliance with OPA 90 does not, however, relieve a tank owner from also complying with the Clean Water Act and his SPCC Plan.

Mass Measurement

Practical application of mass measurement involves lowering a bubbler unit through the gauge hatch to the tank bottom. A differential reference is then placed just above the liquid surface. A low pressure inert gas is conveyed to the bubbler unit at a precisely controlled rate, the pressure required to generate a steady stream of bubbles at the bottom of the tank corresponds to the differential pressure as a result of the fluid mass. An additional tube is attached which eliminates the flowing friction and subsequent back-pressure effects in the differential pressure transducer as a result of this friction. The flow rate is controlled by a highly accurate regulator allowing concentric bubbles to be transmitted to and released at tank bottom. Pressure is measured by a micro-sensitive differential pressure transducer, recorded on a real time basis and post processed using data analysis routines to accurately calculate any changes in the mass of fluid contained within the tank to determine if there is a loss.

Technology Comparison

The fact that leak detection based on mass

measurement measures the mass of fluid in the tank is this technology's most significant advantage. Direct measurement of mass effectively eliminates many potential sources of errors related to real world conditions. Real world variations include the consistency of the soil acting as the tank's foundation, temperature stratification of product, extraneous noise sources, thermal expansion of the tank's contents, local water table level, previous soil contamination and tank shell dynamics.

Leak detection technologies in use today and the sources for potential error in leak measurement, as it relates to ASTs, include the following:

- Mass Measurement - Tank shell variations as a result of temperature effects on the tank shell plating.

- Volumetric Methods - Fluid temperature stratification (vertical and horizontal) in the liquid contents throughout the tank, tank shell expansion and evaporation.

- Acoustic Emissions Detection - Classification of the sonic signature related to tank bottom leaks and the size of these leaks in a variety of unknown tank bottom to soil strata interfaces. Extraneous sonic energy not related to any leak and limitations in applicability to certain fluids and tank sizes.

- Soil Vapor Monitoring - Vapor diffusion patterns with varying products, through a variety of soils and ground water. Correlation of measured vapor to leak rate quantities under unknown diffusion patterns.

- Inventory Reconciliation Systems - Accuracy of flow measurements into and out of the tank and the effect of fluid temperatures and fluid properties on volume measurements.

Mass Technology's mass measurement system overcomes the effects related to tank shell variations through both data collection techniques and data correction techniques. Data is collected on a 24-hour basis, with only the nighttime portion utilized in calculating the leak rate, eliminating the effect of the sun's radiant energy. The nighttime data is corrected for atmospheric conditions and temperature variations in the tank shell. These measures allow the system to repeatedly achieve the stated accuracy in real world conditions on a routine basis. **EP**

James Wolford is vice president of operations and research and development at Mass Technology Corp., Norristown, Pa.

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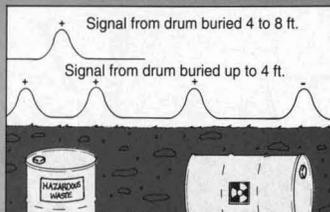
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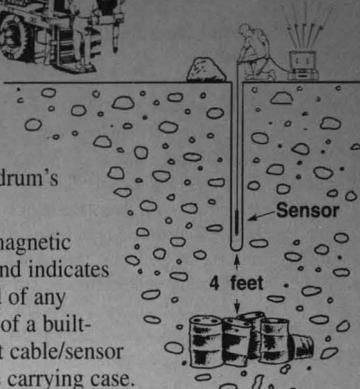
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SLUDGE REUSE

The View From the Top

Environmental Protection decided to find out how the Part 503 biosolids rule is working. The answer: slowly, but surely. In an interview, Alan Rubin, formerly the head of EPA's Sludge Risk Assessment Branch, discussed how the rule is working now and what changes are in store for the future. Rubin is currently "on loan" to the Water Environment Federation, where he is serving as a senior scientist. He will return to the agency next spring and continue working on implementation of the biosolids rule.

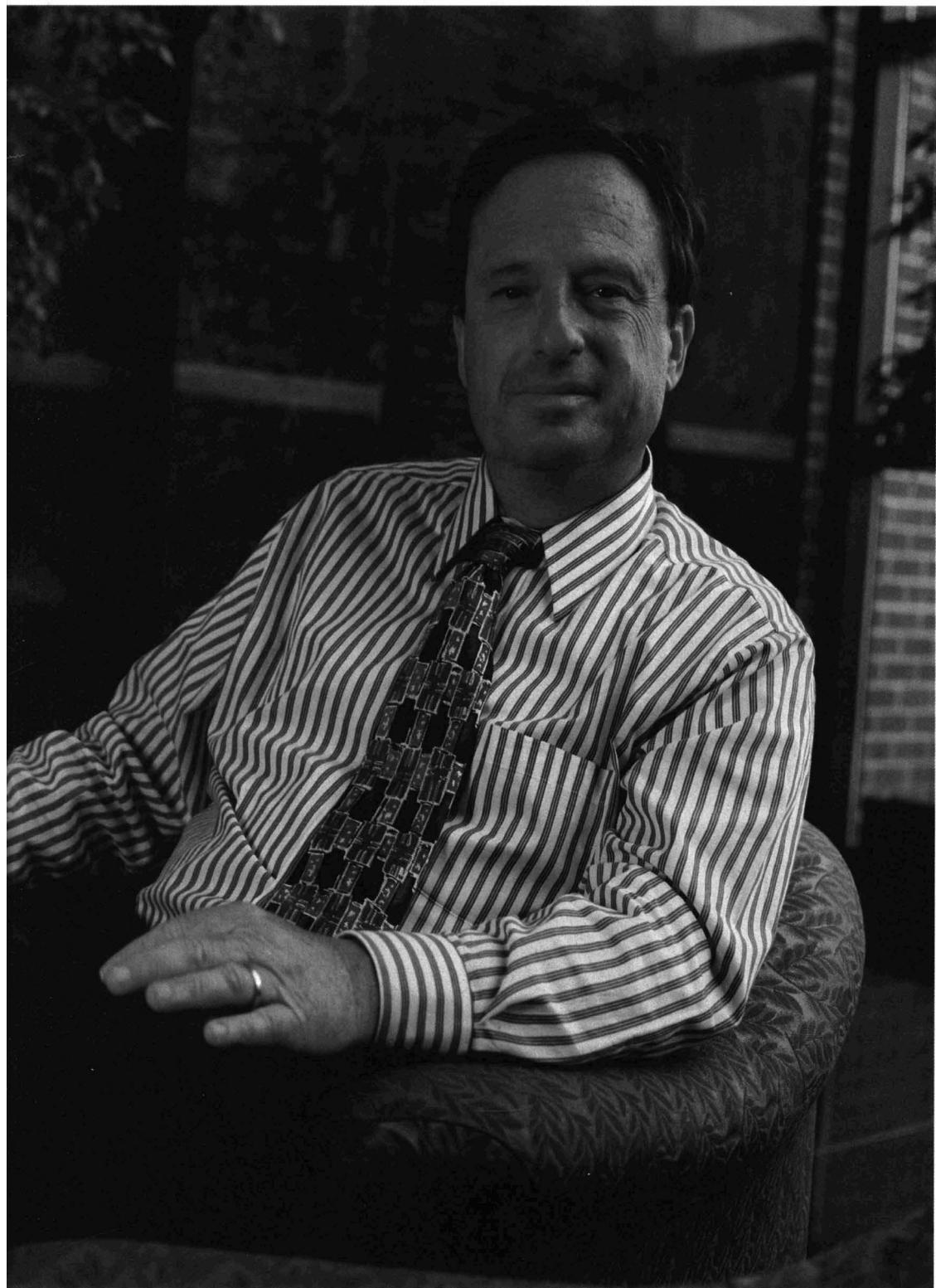
EP: Are states embracing Section 503, the new sludge management rules?

Rubin: There are really two issues here. One is: Are states adopting or embracing the baseline technical standards (40 CFR Part 503) for the use and disposal of biosolids? Every state has to have at least those requirements in their program; if not, EPA will enforce them.

Then there's the other issue: Are states requesting authority from EPA to administer the Part 503 technical regulations through their own permitting programs? For states to do that, they have to request authority from EPA and qualify to do that by being in compliance with 40 CFR part 123, which involves using the National Pollutant Discharge Elimination System mechanism to put 503-type requirements in permits. Or, if they don't have an NPDES program that's been approved, they can still be the permitting authority for Part 503 under a state permitting program and to do that, they have to qualify under 40 CFR part 501.

Regarding the original question, here's the situation. For their Part 503 technical requirements, I would say most states have embraced most of the technical standards, but no state has totally embraced them. Most states have adopted the numerical standards for Part 503, but almost every state has decided they want to increase the separation distance between a navigable waterway and the edge of the biosolids application area beyond the 10 meters we have in the 503 rule. Other states want to add buffer distances between either





Scott Braman

Organoclays: Low-Tech Treatment With Big Potential

A growing number of companies are experimenting with organically-modified clay as an adsorption media for water treatment. And, as an intermediary step for removing trace amounts of emulsified oils after the coalescing process, users are realizing substantial cost savings.

Organoclay, its common name, is made up of bentonite, which is modified with a quarternary amine, then granulated and blended with anthracite. This gives it adsorption properties that far outweigh those of standard carbon filters.

"Basically, it doesn't have an affinity for water," says Gary Davis, a senior sales engineer with Great Lakes Environmental in Addison, Ill. "Probably it takes in just three percent." But unlike granular activated carbon (GAC) systems (which typically adsorb about 10-20 percent of its weight), modified clay can absorb up to 60 percent of its weight in oil, grease, or other sparingly soluble large chlorinated hydrocarbons.

"Clay is a layered structure," explains Davis, "and so the free product is partitioned onto the surface." Although it isn't appropriate as a final treatment step—it can reduce hydrocarbon levels down to not less than 5 ppm — it is an ideal pretreatment to preserve the life of a GAC system. Users have also cited its benefits in working with extremely difficult emulsions — those that defy all normal efforts to break and recover.

Great Lakes Environmental has used organoclay in a number of applications. At one California facility, a manufacturer had 3 percent oil in its wastewater collection system. After treating it with conventional coalescing equipment, followed by bag filtration for dirt removal, Davis used a organoclay to precede final filtration through a GAC filter. He cites the low-tech filter as fundamental to increasing the GAC's bedlife and decreasing costs. "Based on the previous method of disposal — our client was accumulating and decanting their oily water and shipping it to a landfill—the system completely paid for itself in less than two years."

In some cases, says Davis, there are really no other alternatives. When a feed stream varies widely, as was the case with one client who had five different sumps feeding into their waste system, traditional approaches are not as effective. "With an inconsistent feed, it was not economically feasible to go with routine approaches, so we used organoclay as a polishing step following the dissolved air floatation. We found, too, that it removed substantial quantities of heavy metals."

Steve Rosanski, a chemical engineer and researcher for the Columbus-based consulting firm Battelle, is seeing similar results in groundwater clean-up efforts at Andrews Air Force Base. Battelle has been using organoclay to follow an initial settling tank process. "This wastewater starts out at around 1,000 ppm before setting," says Rosanski, "but we still had 100 to 200 ppm going into the clay." By treating it with a 200-pound drum of organoclay, he has measured an average of 5.1 parts per million.

Developed and marketed over the past eight years, organoclay's use is picking up among equipment manufacturers. One major supplier of organoclay, Biomin Inc. of Ferndale, Michigan, offers the product in granular form (blended with anthracite) for use in filtration vessels, and in powdered form for liquid batch applications. "In batch applications," explains Biomin President George Alther, "we are seeing as much as 75% adsorption." Biomin reports many sales for low-flow systems, usually no more than 10 gallons per minute. Alther, who has been researching clay/anthracite's treatment potential since 1989, also reports that organoclay outperforms activated carbon in high temperature situations. "We've found that it still works well in refineries where temperatures reach as high as 185 degrees fahrenheit, whereas activated carbon does not."

One of the few negatives in using clay is that once it has adsorbed its capacity, it does not lend itself to cleaning. Spent media must be disposed in landfills or, occasionally, by incineration.

By Beth Cahape

public or private wells and the edge of the biosolids area. There is no requirement to do that in 503.

So that's where states have been more stringent. But as far as states requesting and gaining authority from EPA, it stands at zero right now. A number of states have asked for authority, but no state has received it. The states closest to getting the authority are North Carolina, Colorado, and Wisconsin, while a number of other states are just beginning the process.

Is that fewer states than you expected at this point?

Rubin: I think EPA and the Water Environment Federation are somewhat surprised, maybe even disappointed, that by this time no states have received authority.

What can EPA do to encourage more states to request the authority?

Rubin: Several months ago, EPA, particularly Mike Cook from the Office of Wastewater Management, asked stakeholders in the biosolids program — states, municipalities, consulting engineers, academics, and environmental groups — to suggest ways they could work with the agency to effect a smooth transition of responsibilities from EPA to other stakeholders. One of the items accepted by EPA was a suggestion from a number of states to submit a petition to EPA to modify parts 123 and 501. States want to make it easier for states to qualify to run their own biosolids programs.

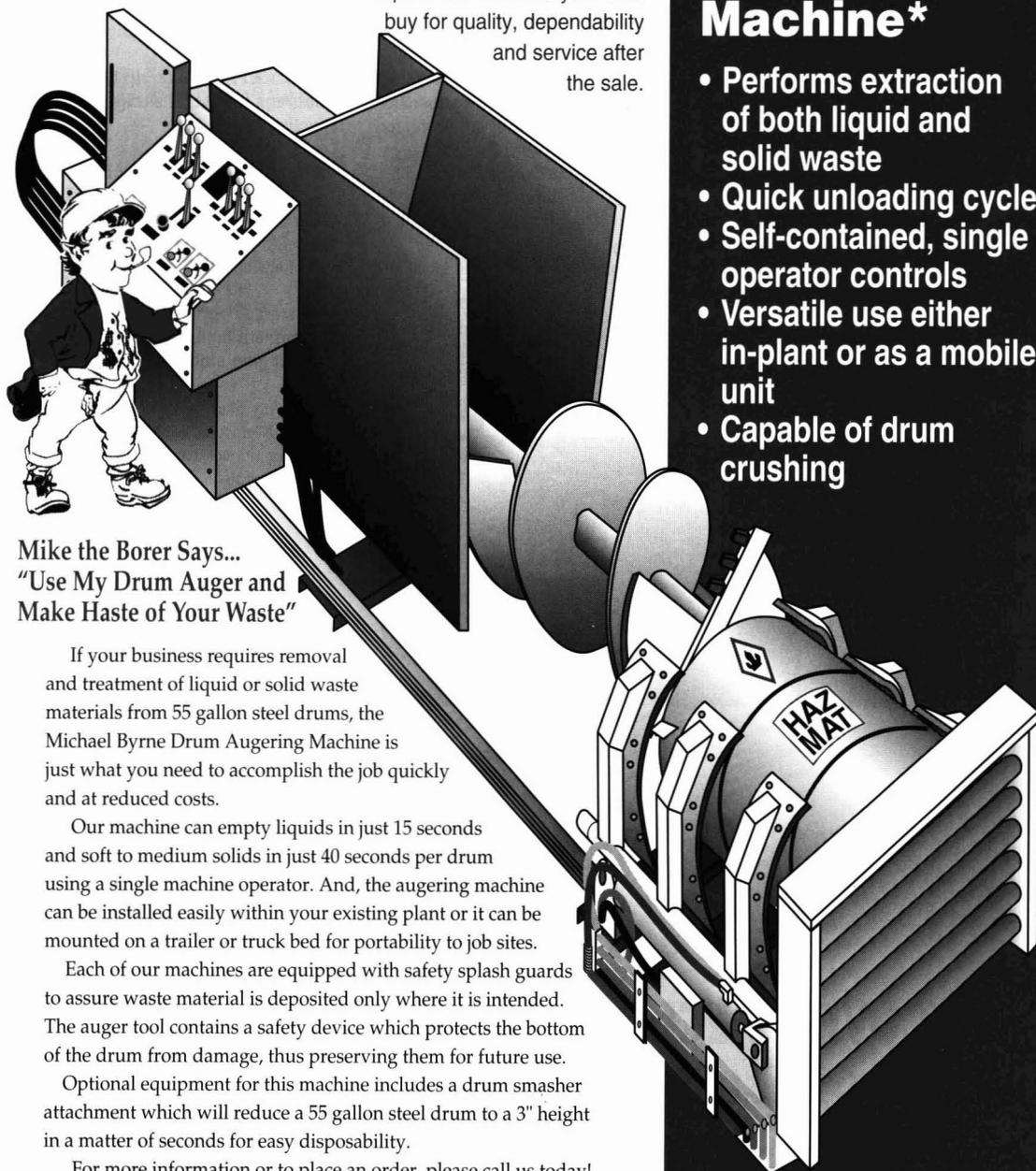
The state officials are now going through 123 line by line and 501 to modify the language. They will then petition the agency to propose modified rules for comment. If that activity succeeds, that would be the best thing for EPA to do to accelerate delegation — go through the rulemaking, and make a change in the rulemaking after comments. In the meantime, I predict there will probably be one or two states, such as North Carolina and Colorado, which will make the breakthrough before the rule is issued.

What will be the overall result of that rulemaking?

Rubin: Once the states get [the authority], it increases the efficiency of the national biosolids management program. The states then will be fully deputized to implement

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Newsmaker Interview

not only 503 but where they feel it appropriate, more stringent requirements. You won't have to wait for EPA regions to permit the material, which should speed things up. They can also target those municipalities and biosolids projects that need more oversight or need more stringent requirements to get them permitted to move those projects forward. For those sites that are running pretty well and don't need as much oversight, they can in theory go ahead with their own operations as approved by the states even without a permit.

Part 503 is a self-implementing regulation, which means that the people running that project have to pick up Part 503, understand it, comply with the requirements, monitor where they have to monitor, keep records, and report where appropriate. They don't even have to have a permit for that. States can adopt that same philosophy once they get the program. They don't have to go through permits for everybody if they don't want to do it, although most likely they will.

That should speed up not only land ap-

plications, but all other use and disposal practices of biosolids, and make it a much more efficient permitting situation.

What has EPA been doing to encourage industrial sludge recycling?

Rubin: That's not really my bailiwick. That's handled through the Office of Solid Waste. In terms of what the agency has been doing to encourage recycling, I can't think of anything through rulemaking.

Have states been adopting contaminant limits that are discouraging sludge reuse?

Rubin: Any time a state adopts any standard in any practice that makes it difficult for the practitioner to comply with, they're going to have to do something else with it.



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*"I would say
most states
have embraced
most of the
technical standards,
but no state
has totally
embraced them."*

Some states have made it difficult for biosolids. There are some states that have very stringent requirements or could be thinking of very stringent numerical standards, which every biosolids recycler who wants to do business in that state could have trouble meeting. Therefore, they're going to go to some other state or not land-apply the biosolids, but landfill them, either by themselves or in a municipal solid waste landfill. Or they can incinerate them. There are states that have much more stringent standards, such as Massachusetts,

Newsmaker Interview

which has a cadmium number of 14 parts per million, as opposed to the federal number of 39. Rhode Island also has a very low number for cadmium.

That would make it very difficult to land-apply at least some biosolids, whether it be biosolids cake on a farm or fertilizer-type material, more of a productlike material, like pellets or compost.

What does that mean for the future of sludge re-use? Is it going to be concentrated in just a few states?

Rubin: No, it's not as acute a problem as that. Certainly if states have very unrealistic and in some cases, scientifically insupportable numbers, it's not going to be very easy to land-apply in the state. Depending on how the state regulations are set up, the material could be composted, and things like wood chips, mulch and other composting materials could be used to dilute the overall biosolids product to a product that then could be applied in a state with very stringent numbers.

However, stringent contaminant limits

will move sludge from that state to another state. Nationally, though, the good news is that the trend is up for overall land application across the U.S. Why is the trend up? Well, it's not really easy to site landfills, and it's not really easy to site incinerators. Some landfills are approaching capacity, while in other cases more stringent state and federal requirements are making it more difficult and expensive to landfill material. Also, Clean Air Act requirements are making it more difficult and costly to incinerate. So, somehow, the system is adjusting, recognizing that.

Will states then end up with landfill problems?

Rubin: That's really hard to say, because you know there's always an option that any state has, and that's to move it to another state. There are even people who have inquired with the agency about export of biosolids out of the U.S., which is allowed. The system adjusts all the time, based on market forces. You can look it as a commodity. It's a material that's produced every day, and it's slowly increasing, as the population increases and as we issue more and more stringent water quality requirements.

The system always is adjusting. Money solves the problem. Say you don't want to land-apply biosolids, but you'd prefer to spend more money to transport the material from state A to state B and land-apply it there. Or you don't want to get from State A to State B, OK, but you'll just put a fifth liner into the landfill so you can landfill it. Unfortunately, when a state imposes unnecessarily stringent standards, whether it be for land application, use or disposal, guess who pays for it? Well, it's us, the ratepayers.

The question is, do you want to spend the money shipping your biosolids, which are almost a non-problem, out of state?

If you impose these incredibly stringent standards, it may make you sleep better at night, but then you've got less money to spend on police, fire protection, housing the homeless and feeding the hungry. This message is starting to get through to a lot of these state and local people. Obviously EPA and the Water Environment Federation believe that Part 503 is the perfect regulation. I'm saying that somewhat facetiously, but it is a regulation that more than adequately protects public health and the environment. You don't have to go any more stringent. **EP**

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A Consultant's Guide to Reducing Liability Risk

By Paul T. Carroccio

The environmental professional faces not only the many professional liability risks of the typical design firm, but the added risks inherent in the practice of environmental consulting. Likewise, laws governing environmental liability include those that govern professional liability, with the addition of certain state statutes that typically extend the liability of those involved in projects subject to CERCLA (the Superfund law) and RCRA, the Resource Conservation and Recovery Act. Complicating the issue is the fact that environmental consulting is a relatively new field with developing methodologies and technologies, making it a moving target where professional liability issues are concerned.

What Is Professional Liability?

Professional liability is based on the application of the legal doctrine known as "The Standard of Care." According to this doctrine, the professional is expected to render services with the ordinary degree of skill and care that would be used by reasonably competent practitioners of the same discipline, practicing in the same geographic area at the same period in time. It does not imply perfection nor does it imply that the professional should be expected to produce a service better than the current state of the art.

Therefore, environmental professionals (ENVs) who claim, for example, that they are able to design a soil vapor extraction system that provides 100 percent removal of volatile organic compounds in a shorter period of time than any other ENV are asking for extra trouble. They have set a higher standard than would be expected of them under the Standard of Care Doctrine.

Strict liability (liability regardless of fault) and joint and several liability (full liability for only partial fault) may be imposed on an owner or operator of a hazardous waste site or the transporter or arranger of hazardous materials. In most cases, the actions of an ENV would not warrant the imposition of these liabilities. However, that might not be true if, for example, the professional has constructive custody over a site as in a design/remediation agreement.

PL Risk By Project Type

All projects, studies or designs have professional liability risks associated with their performance.

- **Preliminary Site Assessments (PSA/ ESA)** are considered by many to be the most risky work an ENV can undertake from a professional liability standpoint. Reasons range from failure to uncov-

er a hidden condition that can lead to large damages, to certifications such as those required by lenders that place the ENV in the position of having to guarantee that the site is free from contamination.

- **Health and safety plans**, particularly for projects other than one's own, can create exposures to liability where bodily injury and wrongful death claims from third parties may result. These risks may include failure to identify specific hazards and OSHA violations resulting from a lack of clarity in the plan.

- **Design/remediation** activities or using the design/build project delivery system for site remediation expands the ENV's liability further into pollution and general liability exposures. A typical project may involve removal of a leaking underground storage tank and cleanup of the surrounding soil.

Risk Management Techniques

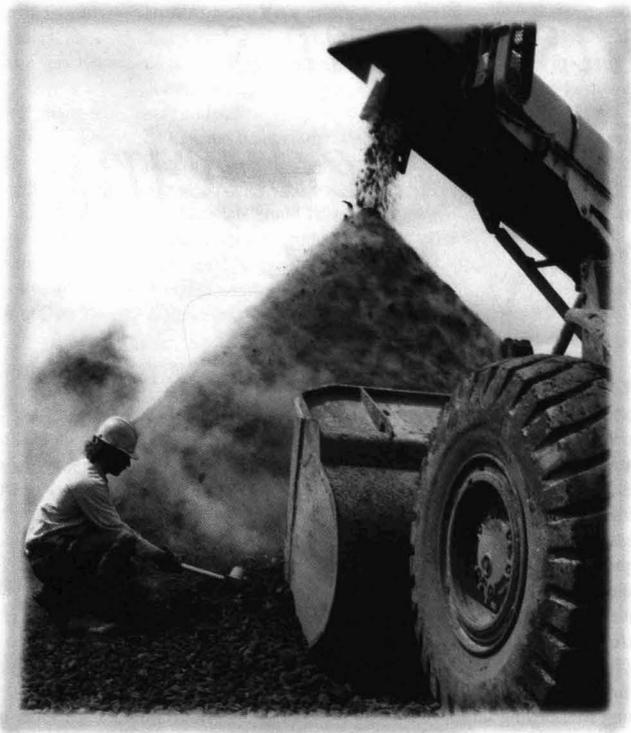
Professional liability risk associated with any project can be managed by the ENV through one or a combination of the following techniques:

- **Retention** – keep all the risk
- **Avoidance** – don't accept the job
- **Reduction** – use appropriate business practices
- **Allocation** – place risks where they belong
- **Transfer** – purchase insurance

Assuming the professional does not want to keep all the risk or turn down every project, the other three techniques merit review.

Risk reduction. Using appropriate business practices to reduce risk is an area where the ENV has a high level of control. Be aware of those business practices that can help minimize or transfer risk associated with pollution-related projects:

- Careful client evaluation and selection
- Careful project evaluation and selection
- Internal evaluation of skills and expertise
- A written contract that includes an adequate scope of services and specifies those services the consultant is not contracted to perform
- Owner's acceptance of appropriate risks and responsibilities and
- Equitable payment terms and conditions



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A Consultant's Guide

Risk allocation. Allocating risk in proportion to benefit received from the project is a sound and acceptable way to limit the liability of the ENV professional. This can be accomplished through the use of Limitation of Liability (LoL) or Indemnification clauses in contracts with owners.

By refusing to accept unlimited liability for a project through an LoL clause, the professional can limit risk to:

1. A specific dollar amount negotiated with the owner based on the value of the project or the consultant's fees derived from the project;

2. The limit of coverage in the firm's professional liability insurance policy, or

3. The limit of coverage obtained for the project in a specific project policy.

While the first option is preferred, any of the above are far better than accepting unlimited liability – particularly if the LoL is coupled with an indemnification from the owner. Although these clauses

cannot protect against a third-party claim, they may provide protection from claims from parties to the contract containing the LoL clause.

Risk transfer. The most common method of risk transfer is through the purchase of professional liability (PL) insurance. Generally, PL insurance provides coverage for negligent acts, errors or omissions, up to the policy limits. Coverage extends to the named firm as well as owners, director, employees and principals acting on behalf of the firm.

Excluded from coverage are:

- Liability assumed by contract if that liability would not have existed without the contract.
- Fraud or willful misconduct.
- Fines or penalties
- Any other exclusion specified in the policy or its endorsements

The PL policy should be examined so that all exclusions are understood, particularly in the areas of pollution

work, "design/build" and asbestos-related work.

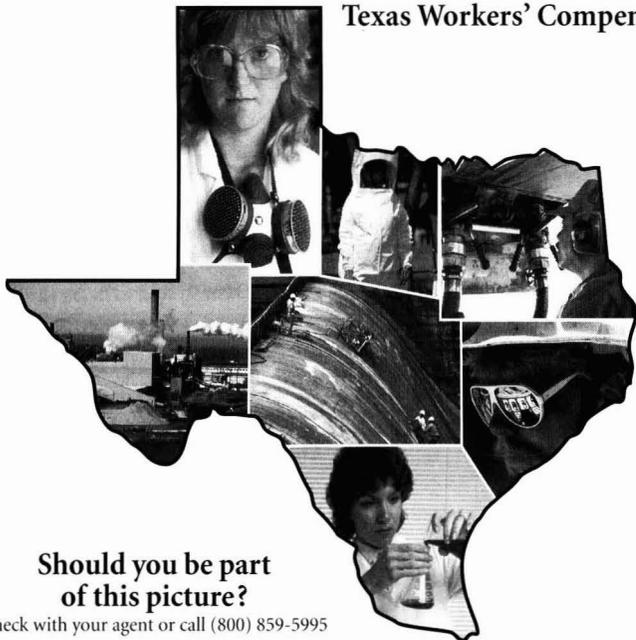
Also be aware that most professional liability policies are written on a claims made form. This means that for coverage to be provided, the claim must take place and be reported to the insurer within the policy term and any extended reporting period.

Environmental professionals should be aware that they cannot avoid professional liabilities. However, they can go a long way to avoid job disputes, claims and lawsuits by understanding their scope of professional liability and taking steps to manage them through risk reduction, allocation and transfer. **EP**

Paul T. Carroccio, P.E., L.S., is vice president, Environmental Program Manager, of DPIC Companies Inc., which provides professional liability insurance for environmental consultants, architects and engineers. DPIC is based in Monterey, Calif.

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Ultrasonic Sensors Can Be Competitive, Smart

Two new ultrasonic liquid level sensors for continuous level monitoring have been introduced by **Lundahl Instruments** of Logan, Utah. Both incorporate sensor and controller, with all electronics built into one self-contained unit. Models DCU-14 and DCU-15 are also designed for easy installation.

"We identified a need in the industry for sensors that were 'smart' and that didn't take an engineer to set up," says Lundahl's Vice President Bob Katner. Both units can also be used in a variety of applications, including storage tanks, sewage pumping stations, chemical tanks, and hazardous waste containment. "We believe these units can be used anywhere a non-contact measurement



would provide benefit to the customer.

Corrosion problems and consequent maintenance challenges are good reasons to choose an

ultrasonic sensor over a standard "float" device but economics, in general, can play an important part.

"We've designed these non-contact sensors to be competitive," says Katner, who suggests that for simple tank applications, model DCU-15 can save a customer as much as 40 percent, in the long term, over traditional floats. "With these units, there is no deterioration of materi-

als," he adds.

Ideal for simple tank applications, the DCU-15 has a 4-20mA analog output fixed over a 1-13 foot operating range. It has an accuracy range of plus or minus .5 percent. The DCU-14 has several added features, including a loss of echo relay alarm system and an internal temperature compensation capability. It's designed for liquid level measurement of up to 25 feet, and has an accuracy range of plus or minus .25 percent. A touchpad allows easy adjustment of the 4-20mA output.

"Ultimately," says Katner, "we think we have brought the cost of a non-contact sensor down to a competitive place, with all the advantages of non-contact level sensing retained."

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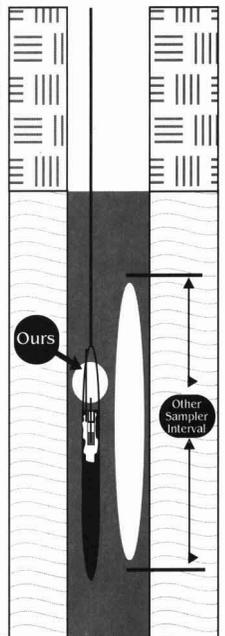
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The KABIS Discrete Groundwater Sampler



The KABIS SAMPLER is the groundwater industries first true depth discrete sampler. Due to the unique design of the sampler, it fills directly into any standard 40ml VOA vial ONLY after it has reached your selected depth. This feature virtually eliminates the need for well purging.

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A fully submersible wastewater pump from Pumpex is self contained and dry mounted, and features a recirculating closed-loop cooling design that permits safe operation in both wet and dry environments. These sealed systems circulate a clean glycol mixture for optimum cooling and minimal clogging risk. Designed to assure even, optimum cooling of the motor regardless of the duty point of the pump, the cooling jacket does not clog since wastewater

or other solids-laden liquids do not circulate within the cooling system. **Pumpex, Inc.**

Circle 81 on card.



Controller-less Bladder Pump System

Lean Environment Equipment has introduced the Genie bladder pump system, which is controller-less and can be used in wells as small as two inches in diameter. A multi-functional pneumatic pump, it can be used in total fluids, dissolved and/or sinkers, product only, dedicated sampling or remote applications. No surface controls are

required. Automatically cycles without depressurizing the air supply line. Designed for air efficiency, it consumes less than 0.16 CFM. Air valves can pass fluids as thick as 30 weight oil.

Clean Environment Equipment

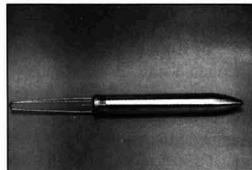
Circle 83 on card.

Real-time Dust/Particulate Monitor

New from MIE, the Data-RAM Aerosol Monitor provides continuous real-time measurement and readouts of airborne particle concentrations, as well as electronic data logging. With a wide particulate measurement range of 0.0001 mg/m³ (0.1 µg/m³) to 400 mg/m³. With a total span of four million units, it is capable of measuring mass concentrations of airborne dust, smoke, mists and fumes in industrial and ambient environments ranging from exceptionally pristine to extremely pollut-

ed. Completely portable and rugged, this unit is powered by either a rechargeable 20-hour internal battery or an external AC or DC source. **MIE Inc.**

Circle 82 on card.



Groundwater Sampler

A depth discrete sampler has recently been introduced by Sabak Industries Limited. The Kabis Discrete Groundwater Sampler fills directly into any standard 40 ml VOA only after the sampler has reached the desired depth, thus providing a more statistically pure sample. With a hydrodynamic design, turbidity in the water column is reduced, and sampling ground-

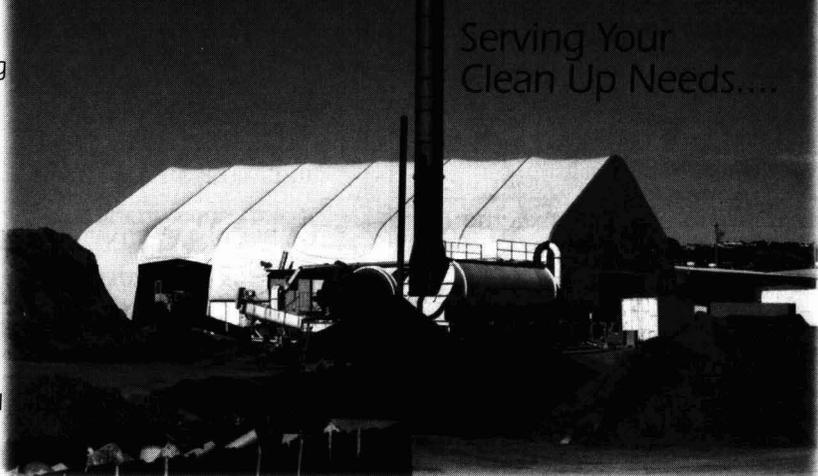
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PRODUCT & SERVICES

water can be done at any desired depth. The manufacturer suggests that well purging is virtually unnecessary. **Sabak Industries Limited, Inc.**

Circle 84 on card.



Pressure Regulator Valves

A new product line of pressure regulating valves from George Fischer, Inc. either reduce, retain or relieve pressure. Offered in a variety of body materials—including PVC, poly-propylene, PVDF and high-purity SYGEF-HP-BCF—these valves are designed for accuracy and stable pressure control irrespective of fluctuations in inlet pressure or changes

in flow demand. Sizes range from 3/8 inch to four inches, and can be used in a wide variety of applications. Pressure rating vary from three to 150 psi (0.2 to 10 bar). **George Fisher, Inc.**

Circle 85 on card.



Soil, Groundwater Probe

The fully integrated, self-powered and compact AMS 9600 from Art's Manufacturing

& Supply performs sampling for site assessment of soils, soil gas and groundwater. Its direct push technology is designed for deep probing with the largest capacity ram available, providing over 37,000 pounds of pull-up force, for easy tool removal. Allows collection of 1.5" x 48" core samples now preferred by consultants, geologists, environmental engineers and regulators. **Art's Manufacturing & Supply, Inc.**

Circle 86 on card.

Oil Content Analyzer

Using a non-dispersive infrared spectrophotometric technique—IR absorbance—the new OCMA-350 from Horiba Instruments has three analytical applications. These are oil in water for environmental, QC or process control applications; hydrocarbons in soil for environmental purposes; and cleanliness verification for pre-cleaned



products and in the wash water. Powered from a generator, or DC to AC inverter, it is light-weight and easy to carry—thus ideal for field analysis. Measurements are displayed in concentration units and are made in less than three minutes, including sample extraction. Accurate to 1 ppm, resolution to 0.1 ppm. **Horiba Instruments, Inc.**

Circle 87 on card.

Wind Tracking Device

R.M. Young Company has introduced the Young Wind Tracker, which has a very readable display, serial output for remote displays and alarms for wind speed and direction as stan-

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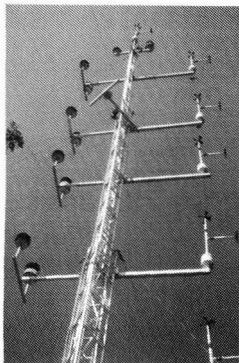
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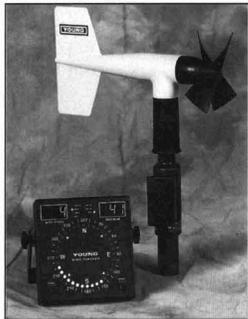
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PRODUCTS & SERVICES



standard features. Current wind speed and direction information, including maximum gust, are displayed, with added features including 4-20mA inputs, voltage wall mounting or panel installation. Designed for bench-top use. **R.M. Young Co.**

Circle 88 on card.

Versatile Ball Valve

The Xomox Tufseal ball valve is a fully-lined, full-port valve for use with both fugitive emis-



sions control and standard face-to-face dimensions (B16.10 regular short-pattern). With this device, processing systems can be more compact, efficient and economical in emissions regulation compliance. Cast in recesses and machined grooves lock the lining to the body and ball, preventing the unpigmented, virgin PFA lining from blow out problems. Sizes from one to six inches are available. **Xomox Corp.**

Circle 89 on card.

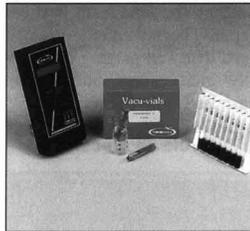
Anaerobic Digester

Direct electric arc sludge treatment systems from Scientific Utilization Inc. (SUI) boost the conversion of volatile solids to methane gas during anaerobic digestion. Designed for use in either municipal or industrial waste facilities, the SR1-1 system increases methane with less hydrogen sulfide and a higher BTU content, thus resulting in lower sludge solids for disposal. Also lowers polymer flocculent usage and produces a drier cake in the detention time. As a fully automatic system requiring little operator attention, it is designed for low maintenance, simple installation, and low power consumption. **Scientific Utilization, Inc.**

Circle 90 on card.

Total Hardness Test Kits

CHEMetrics has introduced a one-minute quantitative test kit to determine low-level total



hardness in boiler feedwater. Measuring in a range of zero to 1000 ppb, Vacu-vial self-filling reagent ampoules contain a unit dose of Calcichrome reagent. Users snap the reagent ampoule in sample and read the result in an instrument that accepts half-inch cells. Compatible instruments include those manufactured by Hach, LaMotte and Milton Roy. As a one-step process, this snap-and-read procedure is designed for accuracy, sensitivity and time and labor savings. **CHEMetrics, Inc.**

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Instruments Catalog

The Free 1995-96 instruments catalog contains over 1,700 full-color pages and features more than 40,000 products covering scientific instruments, equipment and supplies. It includes a detailed 40-page product index, informative introductory pages for several sections, "Hot Tops" and an eight-page section of late-breaking products.

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Circle 64 on card.



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Record Precipitator Spark Rate

This brochure describes the MS4281 Spark Rate Meter. A 4-20mA output allows recording or remote monitoring of spark rate as is now required by some regulatory agencies. Easy retrofit into any Electrostatic Precipitator control system.

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1995 Consultant's Guide

We present *Environmental Protection's* fourth guide to consultants, which lists firms under easy-to-access international and state headings. This reader service provides a network of resources for compliance information, troubleshooting, independent validation and possible alternatives for solving air, water/wastewater and hazardous materials problems.

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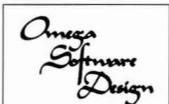
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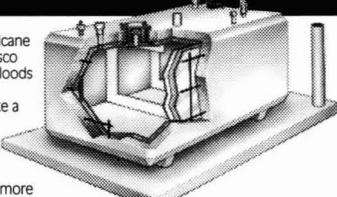
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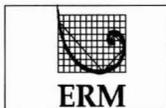
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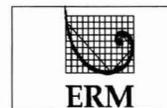
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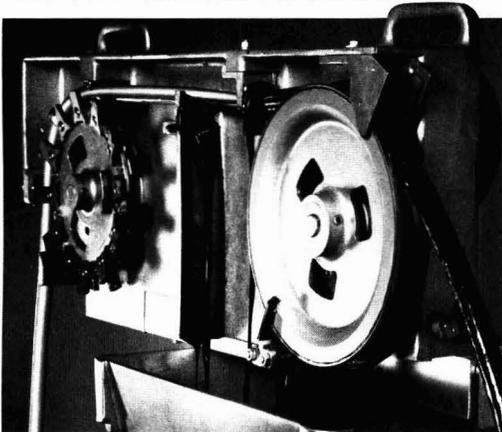
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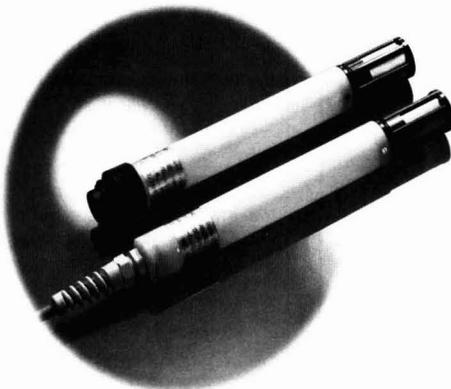
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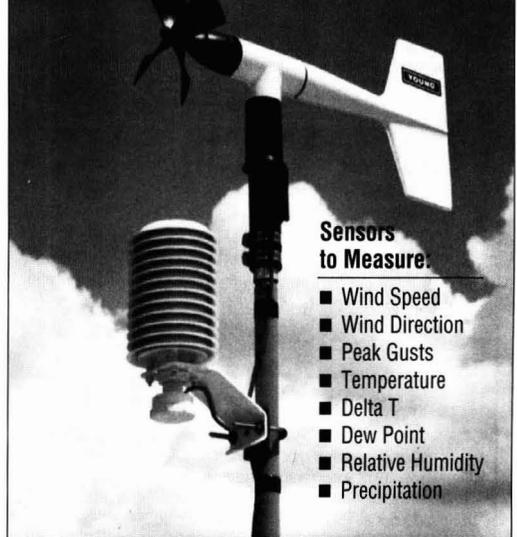
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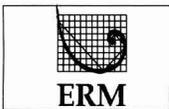
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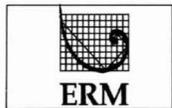
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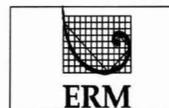
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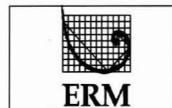
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Pollution Prevention: EPA and Industry at a Crossroads

POLLUTION PREVENTION IS BECOMING THE environmental mantra of the 21st Century. Recent statements by EPA representatives evidence a renewed interest by the agency in pollution prevention projects instituted by companies. In addition, several state and local governments have begun incorporating this concept into their decision-making processes, including new regulations, new chemical reviews, permit, waiver, and cleanup

decisions, and enforcement. Companies that take advantage of incentives offered by federal and state governments and their stated willingness to work cooperatively in the development of pollution prevention programs can only benefit.

This is not an entirely new concept. The federal Pollution Prevention Act was enacted in 1990 and sets out a policy goal of preventing contamination problems by reducing pollution at its source. To the extent pollution

cannot be prevented, companies are encouraged by the Act to recycle wastes and, to the extent recycling is not feasible, these wastes are to be treated in an environmentally safe manner. Disposal is viewed as a last resort. According to June 1993 a Pollution Prevention Policy Statement issued by Carol Browner, administrator of the EPA, pollution prevention is the first strategy to be considered by all programs at EPA.

SEPs

In a more recent memorandum from Browner, as well as recently announced settlement policies of EPA, the agency has focused attention on pollution prevention as a means of enforcing environmental laws. Through EPA's Supplemental Environmental Projects (SEPs) program, a company accused of violating environmental laws may agree to undertake environmentally beneficial projects that it otherwise would not be legally required to perform, in settlement of the enforcement action, to substantially reduce penalties imposed by EPA for the legal violation. According to EPA representatives, factors considered in determining appropriate settlements include the economic benefit accrued due to the alleged violator's commitment to perform a SEP.

In accordance with the hierarchy of management options established by Congress in the Pollution Prevention Act, SEPs involving pollution prevention techniques are preferred over other types of reduction or control strategies. In order to deter environmental noncompliance, EPA will initially seek a substantial monetary penalty, which will then be offset by the estimated cost of a SEP performed by the violator. In other words, by implementing and carrying out a SEP a company can effectively reduce the cost of environmental penalties, while at the same time modifying its own environmental practices to avoid the risk of future violations.

State Requirements

State laws can have an additional impact on the decision of a company to implement pollution prevention techniques. Massachusetts and Illinois have recently announced state enforcement policies comparable to EPA's. And California's Proposition 65 has been credited with having had a similar effect of "encouraging" manufacturers' decisions to reformulate their products to eliminate the use of toxic chemicals.

In order to take advantage of governmental incentives for pollution prevention, companies may need to refocus their internal procedures. To implement environmental compliance programs within industrial facilities, companies have basically looked at the process involved and integrated the environmental requirements into the various functions, such as waste handling and storage procedures. To implement pollution prevention programs, the entire facility and what is produced by the facility must be reviewed in order to effectively integrate new processes that will result in the prevention, reduction, or recycling of wastes. This may involve reviewing chemical inventories to identify linkages between the chemicals and processes; reformulating or redesigning products to render them less toxic; reviewing internal practices and procedures to determine sources of spills and leaks; and making modifications to reduce the amount of waste produced. A company may also review its list of chemicals used or formulated at the site and identify less harmful substitutes. This internal survey should include weighing the increased cost of the new components against the environmental costs of retaining the current process. **EP**

With an eye to eliminating pollution at its source, EPA Administrator Carol Browner has told all agency programs to consider P² as the first option.

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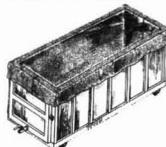
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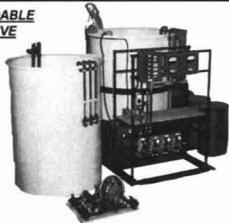
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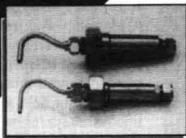
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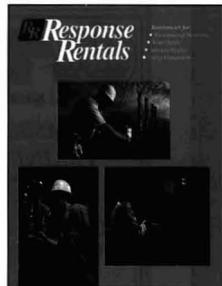
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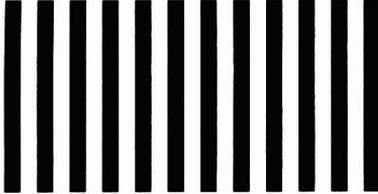
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 B 20-49
 C 50-99
 E 250-499
 F 500-999
 G 1000-1499
 H 1500-2499
 I 2500 and up
 D 100-249

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

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 B Instrumentation
 C Chemicals
 D Parts & equipment for maintenance operation and control
 E Services/Consulting
 F None of the above _____
 (please specify)

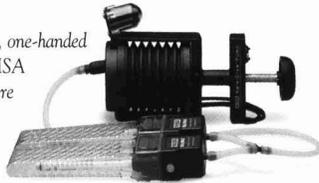
5. What types of Pollution Control are you responsible for? (check all that apply):

- A Air
 B Water
 C Noises
 D Solid waste disposal
 E Industrial hygiene
 F Toxic & hazardous materials
 G Energy control/energy conservation
 H None of the above _____
 (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 Environmental Solutions
 D Pollution Equipment News
 E The National Environmental Journal
 F Water Environment & Technology
 G None of the above _____
 (please specify)

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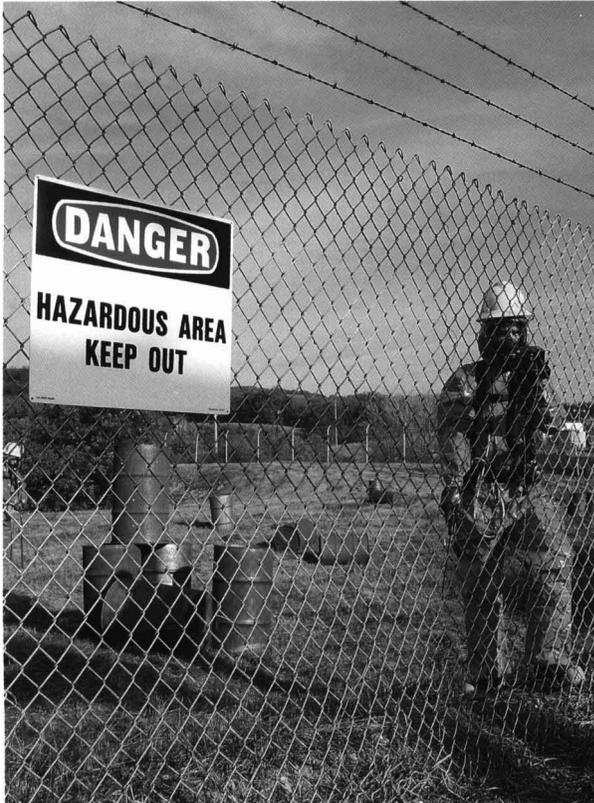


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