



# Pollution Prevention News

POLLUTION



PREVENTION

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## Pesticide Plan Puts Health First

The Clinton administration has proposed the first significant reforms of pesticide and food safety laws in twenty years. The Administration's initiatives, presented to a joint Senate and House committee hearing on September 21, 1993, include changes to the Federal Food, Drug, and Cosmetic Act and the Federal Insecticide, Fungicide, and Rodenticide Act designed to reduce pesticide use and promote sustainable agriculture.

The proposal establishes a health-based standard for pesticide residues in food. Because infants and children face greater exposure to pesticide residues than adults

due to greater consumption of food relative to size, the plan calls for EPA and USDA to identify foods children eat in large quantities and to focus on child safety when setting tolerances for those foods.

The reform package would extend FDA's health-based food additive standard of "reasonable certainty of no harm" to all pesticide-treated foods, including raw fruits and vegetables. Carcinogens could pose no more than a "negligible risk," interpreted as a one in one million risk of cancer, rather than the currently more restrictive Delaney

*(Continued on page 10)*

## Wet Cleaning is Viable Alternative to Dry

*Joint EPA/industry study demonstrates non-solvent cleaning process*

A joint EPA/industry effort has demonstrated the viability of a wet cleaning process for garments. The process appears to be a technically feasible and economically competitive alternative to traditional dry cleaning. This new process drastically reduces the use of perchloroethylene (PCE), the organic solvent used by most dry cleaners that is associated with environmental and human health risks.

"We are very encouraged by the results of this study," said Mark Greenwood, Director of EPA's Office of Pollution Prevention and Toxics.

EPA's Design for the Environment (DfE) program has worked closely with the dry cleaning industry to explore ways to reduce exposures to PCE. EPA has been systematically examining alternative cleaning technologies and processes, and comparing these options in terms of risk, performance,

cost, energy impacts, and resource conservation. The wet cleaning demonstration tested the viability of a non-solvent process that relies on heat, steam, and natural soaps to clean clothes that are typically dry-cleaned.

In collaboration with the Neighborhood Cleaners Association, the International Fabricare Institute, and ECOCLEAN International, DfE conducted a test in late 1992 to examine the cost and performance of conventional dry-cleaning using PCE compared to a water-based process. The wet cleaning process is more labor intensive, requiring better trained operators who must select among various cleaning techniques (including steam cleaning, spot removing, hand or machine washing, tumble drying and vacuuming) depending on the garment type, fabric, and type of soil.

*(Continued on page 10)*



## EPA News

### New Government/Industry Partnership Launched EPA Region 9 Creates MERIT Program to Reduce Emissions

EPA's Region 9 has formed an innovative partnership with local, regional, and state agencies and a diverse cross-section of companies in Los Angeles County, to reduce emissions by promoting pollution prevention. The Mutual Efforts to Reduce Industrial Toxics (MERIT) Partnership is co-chaired by Carl Weisiger from Dow Chemical Co. and Dan Reich of EPA Region 9, who share a vision of creating a pollution prevention technology enterprise zone in southwest Los Angeles County.

Companies may submit pollution prevention projects for review by the Partnership. Those selected will be eligible for expedited permit consideration and compliance assistance from other companies. Although in its formative stages, MERIT has already achieved some concrete successes. For example, it reduced the regional air board's permit

review time for a company's cyanide reduction project from the expected 4-6 months, down to only 14 days from the date the project was accepted by the Partnership. Other projects include: sponsoring an oil refinery roundtable along with industry and other agencies to identify pollution prevention projects for oil refineries in California; a proposal to create a revolving fund to finance pollution prevention projects in the metal finishing industry; and working with major aerospace contractors to include pollution prevention requirements in their contract bid specifications.

Following the official announcement of the Partnership on October 4, 1993, a community advisory board will be established to provide input to the direction of the partnership. For more information, contact Dan Reich, EPA Region 9, 75 Hawthorne St., San Francisco, CA 94105-3901.

### 1993 ACE Grants Awarded

Twelve grants worth \$1.8 million were awarded in 1993 by four Regional Administrative Councils under the Agriculture in Concert with the Environment (ACE) program. Funded projects include studies of biological pest controls, alternatives to chemical fertilizers, sustainable farm management practices, and protection of wildlife and ecosystems.

ACE was established in 1991 by EPA and the Department of Agriculture to promote pollution prevention within the agricultural sector. Three million dollars have been invested in the ACE program in the last two years, with grants going to farmers, universities, research centers, and other associations who are studying and implementing less polluting agricultural practices.

The 1993 Annual Report of the ACE Program summarizes all the ACE projects funded in the last three years. For more information contact Harry Wells, U.S. EPA (MC7409), 401 M St., SW, Washington, DC 20460.

## Letter to the Editor

### Green Living

There is a disturbing irony in your article "Living Green" in the Spring 1993 issue of *Pollution Prevention News*. That is: how does the environmentally conscious homeowner get to the nice new home nestled in the mountainous hillside? How does he or she get back and forth to work? The picture on page 7 does not show any public transit. There are no nearby neighborhood stores, doctors' offices, libraries, parks, schools, etc.

*How does the environmentally conscious homeowner get to the nice new home nestled in the mountain hillside?*

When the environmental balance is finally calculated, what's the difference between that home and any other suburban tract that destroys farmland or greenspace, increases rain water runoff and erodes soil, damages streams and riparian zones, and increases paved areas, thereby increasing radiant heat and lowering natural cooling? And those concerns don't even begin to address the environmental problems directly caused by the automobile!

I would argue that an environmentally conscious home of the future is one that is within the inner city . . . A new or rehabilitated home that captures the charm and talent of workers who actually needed skills in aesthetic design, as well as mechanical aptitude. A home that is near a public transportation system. A home whose occupants use and support nearby businesses, a social relationship with innumerable benefits. A home in a neighborhood with parks instead of parking lots, trees instead of highway signs, and lakes and ponds for cooling.

What is the environmental benefit in our total dependence on a decayed interstate highway system, total dependence on private automobiles, total dependence on burning petroleum, and then pointing to the advantage of building a recycled house in the mountains?

Tom Ewing  
Cincinnati, Ohio

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# Growth in CFCs Seen Diminishing

Good news has been reported by scientists at the National Oceanic and Atmospheric Administration (NOAA) on the amount of ozone-destroying chlorofluorocarbons (CFCs) found in the atmosphere. Concentration levels of two CFCs (CFC-11 and CFC-12) in the atmosphere are still increasing, but at a much slower rate than in the past, reflecting international agreements to limit their manufacture. According to NOAA, if growth rates continue to diminish as they have since 1988, the atmospheric concentrations of the two chemicals will peak before 2000 and then begin to decline.

The slowdown is attributed to the Montreal Protocol, an international agreement to eliminate CFC production by 1996, as well as voluntary cutbacks by producers and users of the chemicals. CFCs have traditionally been used in

refrigeration, air conditioning, and the production of aerosols and foams. CFC-11 and CFC-12 account for about 50 percent of all chlorine introduced into the stratosphere.

The new data are based on weekly measurements of air samples taken from seven sampling sites around the world. The global growth rate for CFC-11 in March 1993 was 3 parts per trillion per year (ppt/yr), down from a high of 11 ppt/yr between 1985 and 1988; the rate for CFC-12 was 11 ppt/yr in March, down from a high of 20 ppt/yr. NOAA researchers expect the concentration of ozone-attacking chlorine to peak at about 4 parts per billion in the stratosphere (up from the current 3.4 ppb) and then to slowly fall. It is still expected to take 50 to 100 years before stratospheric chlorine levels return to pre-Antarctic hole levels, about 2.0 ppb.

In addition to the successful phaseout of CFCs and other ozone depleting substances in the industrialized world, continued improvements in stratospheric ozone will depend on Third World countries reducing their use of ozone-depleting chemicals.

World-wide production of CFCs has slowed dramatically in the last few years, motivated by the Montreal Protocol, consumer choices in the United States, and industry's pursuit of profitable new opportunities in the market for CFC-substitutes. According to James W. Elkins, who led NOAA's research effort at the Climate Monitoring and Diagnostics Laboratory in Boulder, Colorado, "This is a beautiful case study, where science, the law, industry and the public worked together." For more information, contact Tim Tomastik, NOAA, 202-482-6090.

## CFC Regulatory Round-Up

*Following are 1993 highlights of EPA regulatory actions related to CFCs under the amended Clean Air Act. For purposes of regulation, Class I substances include CFCs, methyl chloroform, carbon tetra-chloride, halons, and methyl bromide and HBFCs (proposed). Class II substances include all HCFCs.*

**JAN 1**

Final ban prohibiting the sale or distribution of non-essential products containing Class I substances: silly string, noise horns, non-commercial electronic and photographic equipment cleaning fluids, aerosols, and flexible and packaging foams.

**FEB 11**

Containers of Class I and Class II substances and related products must be labeled as such after May 15, 1993.

**MAR 5**

EPA launched a major initiative called "Cooling and Refrigerating without CFCs" to inform owners of commercial air conditioning and refrigeration equipment of the proposed phaseout of CFC production which will be complete as of January 1, 1996. The initiative encourages equipment owners to re-

cycle existing CFC stocks and to move to CFC alternatives by retrofitting or replacing existing equipment. Alternative refrigerants, retrofit parts, and new equipment are now available for all commercial refrigeration and air conditioning equipment that had used CFCs.

**MAR 18**

In an effort to accelerate the CFC phaseout, EPA proposed a schedule that would phase out production of halons by the end of 1993, methyl bromide by 2000, and all other Class I substances by the end of 1995. Hydrochlorofluorocarbons (HCFCs) would be phased out between 2003 and 2030, depending on their ozone-depleting potential.

**APR 12**

EPA proposed requiring all federal agencies to change their contracting policies and procurement practices to ensure that stratospheric ozone depleters are used to the minimum extent possible. The proposal would apply to new purchases of goods and services as well as renewals of existing contracts, beginning no later than October 15, 1994.

**APR 23**

EPA proposed lists of acceptable and unacceptable substitutes for CFCs and other ozone-depleters, as well as the Significant New Alternatives Policy (SNAP). Under the SNAP program,

EPA evaluates and rules on applications for the use of substitute chemicals and technologies to replace ozone depleters in specific uses.

**MAY 14**

Final refrigerant recovery and recycling rule relating to the Clean Air Act's prohibition on venting refrigerants containing ozone-depleting substances during the service, repair, or disposal of refrigeration or air-conditioning equipment. Technicians must use certain recovery or recycling machines and must be certified by an EPA-approved program. Substantial leaks from large units must be repaired. Refrigerants must be recovered before disposal of the equipment.

**AUG 6**

EPA announces the first U.S. information clearinghouse for the sale and transfer of recycled halons, called the Halon Recycling Corporation. The clearinghouse will match potential buyers with sellers and ensure that the existing stock of recycled halons is available to users with critical needs, such as the military.

For more information, contact EPA's Stratospheric Ozone Hotline, 1-800-296-1996, 10:00 a.m. to 4:00 p.m., Eastern Time.



## Printing

# Pollution Prevention and Risk Reduction in the Screen Printing Industry

Kathryn Pirrotta Caballero  
Design for the Environment

**E**PA's Design for the Environment Printing Project is working with lithographers, screen printers and flexographers to provide information to industries and companies about the comparative risk and performance of alternative chemicals, processes and technologies in printing. The DfE Printing Project seeks to encourage the systematic evaluation of these alternatives to reduce the creation of pollution at its source.

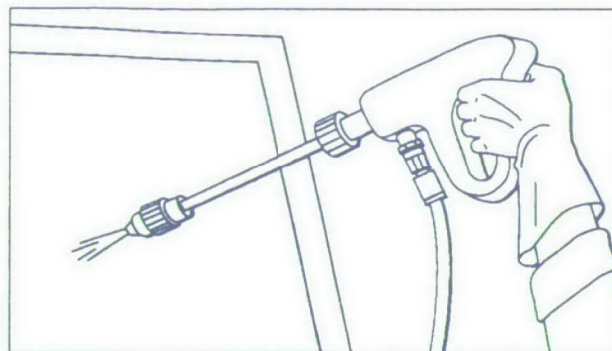
The screen printing industry is actively engaged in extensive efforts to promote risk reduction and pollution prevention in the screen printing process. Representatives from industry, the Screen Printing Association International (SPAI), and DfE have identified screen reclamation, or screen cleaning, as a process in need of environmental redesign.

### Screen Printing Process

The screen printing process involves stretching a porous mesh material over a frame to form a screen; a stencil is applied to the screen which provides the physical boundaries for ink as it moves through the screen mesh. The screen is used to print onto virtually any type of surface, including plastic, textiles, metals and papers. Over 85 percent of screen printers reclaim and reimage their screens daily for future use, rather than storing them for later reprinting. Cost savings provided by reclamation include mesh, stencil materials, labor and storage space.

Screen reclamation or screen cleaning involves the removal of the ink and stencil (or emulsion) from the screen surface. After all excess ink has been scraped from the screen, an ink re-

mover, typically solvent-based, is applied to remove ink residue. A stencil remover is then applied to dissolve the emulsion and the emulsion is completely removed with a high-pressure water spray. Residual pigment and resins from ink and stencil material may



*High pressure water blaster.*

accumulate as stains or "ghost images" after repeated screen uses. The application of a ghost or haze remover can eliminate this problem.

### Traditional Cleaners

Traditionally, screen printers have used ink remover, emulsion remover and haze remover products to clean screens. However, the chemicals used in these products include petroleum-based solvents, such as toluene, xylene and mineral spirits, and caustics, which can be hazardous to human health and the environment. Solvents are often allowed to evaporate during use, resulting in fugitive volatile organic compound (VOC) emissions. Ink and emulsion constituents frequently wash down the drain with the emulsion and haze removal products. The DfE Printing Project has been examining the screen reclamation process to identify less hazardous chemicals, change work practices to limit human exposure to hazardous chemicals, and explore new technologies.

Both simple and complex changes have been identified. For example, a hose is frequently used to apply ink remover to a screen, a messy and costly process. Adding an adjustable spray nozzle, like that on a garden hose, provides a more direct and efficient

## 'Great Printers Project' Announced

A new cooperative effort has been launched to make pollution prevention a standard business practice in the printing industry. On August 9, 1993, in Duluth, Minnesota, Governors Arne Carlson (MN), John Engler (MI), Tommy Thompson (WI), and George Voinovich (OH), EPA Region 5 Administrator Val Adamkus, Dr. Manik Roy of the Environmental Defense Fund (EDF), and Dr. Tom Purcell of the Printing Industries of America (PIA) announced "The Great Printers Project" — aimed at creating a business environment which prevents pollution at the source throughout an entire industry.

A project team made up of Great Lakes regulatory agencies, EPA, printers, print buyers, printing industry suppliers, technical assistance providers, environmentalists, and labor is identifying barriers to, and incentives for, pollution prevention and general environmental protection. The project seeks to reduce energy use as well as pollution and waste from solvents used in cleaning, waste ink, and photo processing materials, without reducing industry growth. The project is based in the eight Great Lakes states (IL, IN, MI, MN, NY, OH, PA, and WI) which account for 43 percent of U.S. printing.

The project will determine what technical and regulatory assistance would be useful and how it should be provided; look at the materials and equipment that are used by the industry to see if improved methods or additional research might be helpful; and investigate the possibility of inadvertent barriers caused by specifications set by print buyers. Recommendations will be published in the Summer of 1994.

— Manik Roy, Ph.D., Environmental Defense Fund

(Continued on page 9)



## Small Business

### Clean Bay Business Demonstrates Cooperative Approach

The Palo Alto Regional Water Quality Control Plant (RWQCP), with help from the environmental consulting firm of Uribe & Associates and extensive input from the regulated community, has developed and implemented a pilot project to reduce pollutant discharges from vehicle service facilities. Because of the nature of this industry, consisting of many small businesses, RWQCP adopted an innovative approach emphasizing education, assistance, and positive incentives to achieve compliance. The first year of the *Vehicle Service Facility Waste Minimization Program*, also known as the *Clean Bay Business Program*, demonstrated the value of this approach.

Vehicle service facilities were originally targeted for attention when stricter water discharge permit limits, set by a regional authority, required RWQCP to look at ways to reduce discharges of metals into South San Francisco Bay. Because service facilities have been identified as significant contributors of metals to both sanitary and storm sewers, the communities served by RWQCP developed new sewer use ordinances for them, effective October 1, 1992. RWQCP's challenge was to inform facilities of their upcom-



Claire Elliott of Uribe & Associates speaks with shop owner Bob Helming during a waste minimization visit.

ing obligations and help bring them into compliance.

In the first 12 months of the program 98 percent of the 326 facilities in RWQCP's service area received on-site visits. During these visits they were educated about the new sewer ordinance and about "Best Management Practices," which are procedures designed to minimize pollutant discharges. At the time of the first visit, 67 percent of facilities had moderate to severe deficiencies with respect to the new requirements, and only 4 percent were in full compliance. Each shop was then mailed a notice identifying the changes necessary to achieve full

compliance, and offering incentives in the form of a "Clean Bay Business" recognition program. All facilities were later re-visited by RWQCP staff. By the time of the ordinance effective date, 57 percent of the facilities were in full, or very close to full compliance.

In the first year of the program, 131 vehicle service shops were awarded recognition as "Clean Bay Businesses." They received decals, sew-on patches, bumper stickers, and

logos for use in advertisements, and were honored by full page ads in local newspapers.

The elements that were judged most important to the success of the program include:

- a cooperative approach, which sought out input from the regulated community throughout program development;
- the use of technical outreach and positive incentives, in recognition of the limited technical knowledge and resources available to most small businesses;
- a commitment to *on-site* visits (in addition to workshops, brochures, mass media, etc.) that led to specific answers for specific problems;
- an emphasis on visits, presented as a helpful service to facilities before regulations went into effect, instead of more threatening inspections afterwards; and
- a multi-media approach addressing wastewater, stormwater, hazardous waste, recycling, air quality, worker safety and other issues.

For more information about the Palo Alto Vehicle Service Facility Waste Minimization Program, contact Geoff Brosseau, Uribe & Associates, tel. 415-325-9195, or Suzanne Healy, RWQCP, tel. 415-329-2117.

### Pilot Project to Assist in Obtaining Credit

EPA's Pollution Prevention Division (PPD) is conducting a pilot project, in conjunction with Region 3 and the Maryland Department of the Environment, to assist small and mid-sized businesses in obtaining credit to finance pollution prevention projects. Although the problems of obtaining credit are not unique to prevention projects, the innovative aspects of the prevention concept can add to the skepticism usually held by any prudent lender.

The first stage of the new project will involve discussions with small businesses, lending institutions, trade

associations, and others to identify the causes of the perceived environmental credit crunch, including factors such as liability concerns, and banking regulations. In the next stage, specific steps will be identified and implemented to assist businesses in obtaining financing for prevention projects. PPD was particularly eager to have this pilot project conducted at the state level where participants can build relationships with lenders, Small Business Development Centers, and other entities with expertise in obtaining credit. For more information contact Ed Weiler at 202-260-2996, or John Robison at 202-260-3590.



## Case Study

# Mobile Plating Bath Rejuvenation at McClellan AFB, Sacramento, CA

The metal plating facility at McClellan AFB, Sacramento, CA recently benefited from the assistance of the Environmental Process Improvement Center (EPIC), an alliance between McClellan Air Force Base, the U.S. Environmental Protection Agency, Region 9, and Cal-EPA. The project was conducted by a process action team, including platers, engineers, and support staff, under the leadership of an experienced plater. The team systematically investigated proposed changes in order to make successful process improvements. Improvements were developed by EPIC for three mobile treatment processes: a filter press, a bath chiller, and an electrowinning tank. These improvements save money and reduce waste.

### Waste Management Activities

With 27 processes and over 200 tanks, McClellan's plating facility is a large and diverse operation. It conducts precious and non-precious metal plating and surface treatments, and includes a variety of stripping and cleaning tanks. Hazardous wastes are generated from many processes. In the past, tanks from chem-mill etching, anodizing, caustic cleaning, and other processes were dumped when solids contamination rendered the system ineffective. Disposing of the tanks' contents resulted in burdensome hazardous waste handling and disposal costs as well as costs of more than \$1,000 per tank for the purchase of replacement chemicals.

Cyanide-containing plating baths (such as those used for cadmium, copper, and silver) produce carbonate salts when they react with carbon dioxide in the atmosphere. The salts lead to degradation of the plating process, and the bath solution must be replaced. Exacerbating this problem at McClellan AFB were air spargers, used for mixing purposes, which introduced

additional carbon dioxide into the baths. McClellan AFB engineers removed the spargers, but the tanks still needed to be replaced twice a year at a cost of \$2,500 to \$6,000 per tank, depending on the size of the tank.

A previous attempt to precipitate the calcium salt by using a heat exchanger to lower the temperature to 30° F had to be abandoned. The carbonates precipitated on the walls of the heat exchanger, lowering the heat transfer efficiency and clogging the exchanger.

Finally, the stripping of worn silver, gold, or platinum plated parts prior to replating leaves some metals in solution, despite attempts to collect and recycle them. The solution eventually becomes so contaminated that it is no longer useful, and must be disposed of. Stripping tanks at McClellan AFB used to be replaced annually at a cost of \$1,000 to \$2,000 per tank.

### Waste Minimization Opportunities

**Filter Press.** To reduce the waste handling and disposal costs associated with dumping solutions from chem-mill etching, anodizing, caustic cleaning, and other processes, McClellan AFB purchased a portable filter press for approximately \$7,000. The press removes particles at a rate of 30 to 40 gallons per minute. The resulting filter cake is 50 percent water by weight and is sent to a metal reclaimer for recycling. The use of the filter press has extended the bath lives indefinitely.

**Bath Chiller.** McClellan AFB staff were still convinced that temperature-induced precipitation was an effective method for cleaning up cyanide-based plating baths. When the heat exchanger process failed, they tried another method to lower the bath temperature. A portable glycol-mixture refrigeration unit is now used to reduce the bath temperature. Heat exchanger coils are

submerged for 24 hours in 300 gallon batches of contaminated solution. The process lowers the temperature of the solution sufficiently to precipitate most of the carbonates. The solution is then returned to the original bath and the precipitate, containing carbonate, metal, and cyanide, is sent to a metal reclaimer. As in the filter press, the bath life is extended indefinitely.

**Electrowinning.** The third successful pollution prevention project at McClellan AFB involves a mobile electrowinning unit. The small unit, including a 25-gallon plating tank, a 100 amp rectifier, and a five gallon per minute pump, cost the facility \$3-4,000. It is wheeled on a rolling cart to a contaminated strip tank. Once hooked up to the pumpout and return lines and programmed, the unit operates for 24 hours by reverse-plating metals out of solution and onto a mesh. The resulting metal-clad mesh is then sent for recycling. The metal concentrations in the stripping solution are reduced ten-fold and the bath life is extended indefinitely.

Both small and large plating shops can benefit from mobile bath rejuvenation equipment, which extends bath lives indefinitely and saves waste disposal and solution replacement costs. An added benefit of the mobile equipment is that it can be used by existing personnel with little or no additional training.

*This case study was reported in "Rejuvenating Plating Bath," an EPIC Greensheet, produced by the Environmental Process Improvement Center Alliance, Spring 1993. EPIC promotes effective environmental protection through innovative management, education, communication and action. More information can be obtained from technical representatives at McClellan AFB: Ray Exposito, Process Action Team Leader, 916-643-6534; or Steve Mayer, Environmental Manager, 916-643-2704.*



## In the States

### Wisconsin Appliance Turn-In Program Is Successful Model

**W**isconsin Electric's Appliance Turn-In program (APTI) has been profiled by The Results Center as one of the most successful energy efficiency programs in North America. APTI began in 1987 as the nation's first large scale residential appliance turn-in program, with the goal of helping the environment while helping its customers financially.

The program aims to get underutilized, non-essential appliances, such as second refrigerators, freezers, and unnecessary room air conditioners, out of service and properly dismantled. At the customer's request, Wisconsin Electric will remove the appliances at no charge and then present the customer with a \$50 check for each refrigerator or freezer, or a \$25 check for an air conditioner. APTI and its 800 telephone number have been actively promoted through the media, appliance dealer showrooms, and bill inserts.

As of December 1992, well over a quarter of a million residential appliances had been collected through APTI, 60 percent of them refrigerators, 30 percent air conditioners, and 10 percent freezers. More than \$37 million in incentives have been paid out, with approximately one-quarter of all residential customers participating. All of the collected appliances are properly dismantled and recycled. Metal compo-



*Wisconsin Electric collects 100,000th appliance.*

nents are recycled, capacitors are sent to an EPA-approved facility to be destroyed, and refrigerants are drained and stored for re-use. Over 69,000 pounds of CFCs have been safely recovered through this program. Wisconsin Electric estimates that if all the collected appliances had gone to a landfill they would have covered a 10-acre area to a depth of 15 feet.

The Results Center's profile of APTI reports that in its first four years this program resulted in total annual electric-

ity demand reduction of 20.8 megawatts (MW), and cumulative energy savings of 195 gigawatt-hours (GWh). This translates into 452 tons of avoided sulfur dioxide emissions. Participating customers are saving an average of \$15-\$25 a year on their electric bills and *all* customers save because the utility can delay adding new electric generation capacity.

Wisconsin Electric's energy conservation program has been recognized and honored many times over the last five years,

including awards from: the Governor of Wisconsin; the National Wildlife Federation; Friends of the United Nations Environment Program; and Renew America's Searching for Success program.

A free executive summary of the APTI profile is available from the Results Center, 303-927-3155. The Results Center also has compiled profiles of 59 other exemplary demand-side management programs from across North America.

### Massachusetts, Oregon, Connecticut Promote Prevention

#### Massachusetts Tackles Pesticides, Labs

**T**he Massachusetts Office of Technical Assistance (OTA) has recognized that schools generate significant environmental impacts. An OTA working group is developing an Integrated Pest Management (IPM) pilot project to be implemented at five Boston schools. An IPM firm will be hired this fall under a 1-2 year contract to demonstrate the feasibility of reducing chemical pesticide use.

OTA has also developed a package of

information to assist in implementing pollution prevention in high school and college chemistry labs. The information covers lab safety, chemical storage, microscale lab techniques, and chemical purchasing. For more information contact Lisa Dufresne, MA OTA, 617-727-3260, ext. 638.

#### Lessons Learned in Oregon

**I**n 1989 Oregon passed the Toxics Use Reduction and Hazardous Waste Reduction Act, becoming one of the first states to implement a TUR facility

planning requirement. In 1992 the U.S. Government Accounting Office (GAO) reviewed Oregon's program and recommended that similar facility planning requirements be enacted at the national level. Now the Oregon Department of Environmental Quality (DEQ) has issued a 1993 *TUR Program Report* which examines the results of the program to date.

The Oregon law required certain facilities to draft TUR plans, and required DEQ to provide necessary

*(Continued on next page)*



## International

### Environmental Improvement in Eastern Europe

Earlier this year ministers and senior officials from 50 countries endorsed the Environmental Action Programme for Central and Eastern Europe (EAP). Drafted by government institutions, the World Bank, non-governmental organizations, business representatives, scientific organizations, and others, the EAP identifies the most urgent environmental problems in Eastern and Central Europe, and suggests investments, policy reforms, and institutional measures to help resolve them.

Recognizing that money is scarce, the EAP focuses on measures and investments likely to provide quick, measurable improvements at low cost. The report identifies numerous "win-win" investments that will provide economic as well as environmental benefits. Examples include energy and water conservation, and improved industrial management, three mainstays of the pollution prevention movement. The EAP forecasts that much environmental improvement will come with economic transformation, rising energy prices, and the shift from heavy industry to cleaner technologies.

World Bank donors have pledged over \$30 million to help implement the recommendations. Since international financial institutions have traditionally been involved in large, capital intensive projects, creative thinking will be needed to foster the many effective small-scale activities advocated in the EAP. For more information contact Wendy Ayres, Environment Division, World Bank, 1818 H Street N.W., Washington, DC 20433.

### Integrating the Environment into National Accounting

Traditionally, when a nation assesses its wealth, economic accounting practices have not included natural resources or environmental health as valuable assets to the country. This omission often makes it difficult to demonstrate the value of sustainable development as compared to more resource exploitive development models.

A new report from the World Bank, *Toward Improved Accounting for the Environment*, addresses this shortcoming. It describes recent progress in developing methods for accounting for natural capital within the usual eco-

nomie framework. The report includes results of two studies carried out jointly by the United Nations' Statistical Division (UNSTAD) and the World Bank, and reiterates that the process of national accounting is by no means an exact science.

The report's editor, Ernst Lutz, a Senior Economist in the World Bank's Environment Department, writes: "[Nations] must recognize that income is easier to approximate than assets, which are far more complex for they range from produced capital to various kinds of non-produced capital such as minerals, soil, water, and wild biota."

Another limitation to environmental accounting is the absence of clear price information for environmental assets. No consensus exists yet among national accounting experts, and approaches to determining these numbers remain widely divergent.

"Despite the strides that have been made in this field of research, further work, including case studies, is clearly needed to pave the way for a broader consensus on accounting conventions and on a number of conceptual matters," notes the report.

Copies of this report, #12436, are available for \$32.95 from: World Bank Publications Dept., P.O. Box 7247-8619, Philadelphia, PA 19170-8619.

### In the States

(Continued from previous page)

technical assistance. Implementation of plans is voluntary, but progress will be monitored by DEQ. In the 1993 report DEQ finds that the planning program has been highly successful among larger facilities, with a compliance rate of 97 percent. However, the compliance rate for small quantity generators was only 36 percent, leading the DEQ to adopt a more vigorous outreach and assistance program, and to consider modified planning requirements for these facilities.

Tracking actual reductions in chemical use and waste generated has proved

a challenge, but DEQ expects to develop a quantitative measurement tool in 1993 to chart future progress. Copies of the report are available from Oregon DEQ, 503-229-5913.

#### Connecticut Publishes Prevention Resources

The Connecticut Department of Environmental Protection (DEP) has recently published two handbooks containing specific prevention ideas. *Best Management Practices for the Protection of Groundwater* describes best environmental management practices for 20 small business segments including drycleaning, non-agricultural

pesticides, auto repair, and furniture refinishing. Suggestions for waste reduction, good housekeeping, process changes and other improved management techniques are listed. The handbook is available for \$5 from the Bureau of Water Management, DEP, 79 Elm St., Box 5066, Hartford, CT 06102-5066.

The second publication is a collection of pollution prevention checklists for 20 larger industries including circuit board manufacturers, printing, chemical manufacturers, pharmaceuticals, and aerospace. The set of 20 checklists is available for \$5 (payable to "DEP Publications") from Maps and Publications, CT DEP, at the address indicated above.



## Transportation

### Chicago Funds Alternatives to Automobiles

Clean air advocates have convinced the Chicago Area Transportation Study (CATS) to fully acknowledge the air quality impacts of automobiles and devote \$50 million to bicycle, transit and pedestrian projects. The key was to get CATS to admit that "cold start" auto emissions, occurring in the first few minutes of operation before the emissions controls start to work, account for a major portion of total auto emissions.

The background of this debate involves the federal Intermodal Surface Transportation & Efficiency Act (ISTEA), the modern version of the old-fashioned "highway bill," which allows states flexibility in pursuing alternatives to highway construction. One section in particular, the Congestion Mitigation and Air Quality (CMAQ) program provides special funding for transportation projects that help states, and metropolitan planning organizations such as CATS, meet air quality standards.

Many states and metropolitan areas have used their CMAQ dollars to fund traffic flow improvements (such as re-timing traffic signals) and other conventional auto-oriented projects which achieve only small improvements in air quality. Chicago was also headed in this direction until activists from the Chicago Lung Association, the Chicagoland Bicycle Federation, and other groups convinced CATS that they were seriously underestimating the air quality

impact of even short car trips.

In order to compare different projects, Chicago's CMAQ committee had been using a computer model that predicted emissions based on vehicle miles travelled, speed, acceleration, and other factors. The model predicted that large emissions reductions could be achieved by encouraging shorter, "smoother" car trips (suggesting projects such as park-and-ride lots, and traffic flow improvements). In fact, activists argued, this is inaccurate. Because of the cold-start emissions problem, every vehicle trip of any length contributes significantly to air pollution. EPA's Region 5 also weighed in on the side of alternative projects, stating that funding for traffic flow improvements was a "questionable" use of CMAQ funds.

When the committee accepted this analysis and changed the project evaluation criteria to assign greater value to vehicle trips avoided, non-automobile projects rose to the top of the CMAQ project selection list. The final list includes \$4 million for bike lanes, a right-of-way acquisition for the Conrail Bikeway, and bike lockers at five METRA rail stations. This still leaves 97 percent of Chicago's Surface Transportation Program funds for road projects. Clean air advocates hope to pressure CATS to consider environmental impacts in all regional transportation planning. For more information contact

the Chicagoland Bicycle Federation, 312-427-3325.

*(This article was adapted from the Transportation Exchange Update, July 1993, a monthly newsletter published by The Environmental Exchange (202-387-2182), a non-profit organization promoting successful, economically viable environmental initiatives.)*

### Resources



**"Linking Bicycle/Pedestrian Facilities with Transit** details the successful integration of bicycle and pedestrian facilities with transit in Europe and Japan, discusses developments in U.S. cities, and makes recommendations for action. Available for \$18 from the Campaign for New Transportation Priorities, 900 2nd St. NE, Ste. 308, Washington, DC 20002.



**The Bicycling Blueprint: A Plan to Bring Bicycling into the Mainstream in New York City** contains specific recommendations for state and local government agencies, covering every aspect of urban cycling. Although the recommendations are directed to New York agencies many of them are applicable to any large city. Available for \$15 from Transportation Alternatives, 212-475-4600.

### Printing Industry

*(Continued from page 3)*

application of the product. Screen reclamation wastewater is often allowed to drain directly to the sewer. The installation of a simple filtration unit to capture heavy metals can make the process "drain-safe." A more complex change involves the use of a high-pressure water blaster (3000 pounds per square inch) to remove the stencil from the screen. The high-pressure device

substantially reduces the quantity of emulsion and haze remover needed to reclaim the screen.

#### Cost Savings

Making use of new technologies can result in a safer work environment and can actually save money. For example, an open tank screen cleaning system allows large quantities of solvent to evaporate. Use of an in-process recycling still to recover solvent eliminates these fugitive air emissions and reduces

the amount of product needed. Romo Incorporated, a screen printer in De Pere, Wisconsin, switched from an open tank system to an in-process recycling still and saved over \$20,750 per year in solvent procurement costs alone.

For information on the DfE Printing Project or to receive a copy of the DfE Screen Printing Case Study, which describes a successful pollution reduction program at a screen printing facility, call the Pollution Prevention Information Clearinghouse at 202-260-1023.



## News & Notes

### Pollution Prevention at Boy Scout Jamboree

Some 35,000 Boy Scouts and nearly 100,000 others attended the National Boy Scout Jamboree at Fort Hill Army base near Fredericksburg, Virginia from August 4-10, 1993. There to greet them on the Conservation Trail was EPA's Pollution Prevention and Environmental Careers display, along with educational exhibits from other federal agencies.

United by the theme of pollution prevention, several programs and labs put on a show for the crowds of Scouts, adult leaders, siblings, and other supporters who wandered through our tents and trailers. Among the exciting exhibits were an electric car, solar-cooked chocolate chip cookies, solar powered slot car races, a "Jurassic Park" DNA demonstration, radon tests, plastics recycling displays, Toxics

Release Inventory computer printouts for the Scouts' hometowns, water pollution presentations, videos, and the electric pump-your-own-energy bicycle.

The electric bicycle got some of the best reactions, as Scouts climbed onto a bicycle hooked up to a 12 volt generator. The power from the generator was fed through meters to a variety of electric appliances, including incandescent and fluorescent light bulbs, a radio/cassette player, a fan, and electric hair dryers. When EPA staff turned on the fluorescent bulbs it was easy to pedal the bike, but when incandescents were switched on, the groans started. Then came the hair dryers and really loud grunts. The participants learned by direct experience that preventing pollution with efficient technologies is the way to go.

The Scouts also loved the solar electric slot car races. Watching these 2-inch models zoom around the track inspired them to take a closer look at the

full-size zero-emission electric commuter car provided by Virginia Power, along with a battery powered lawnmower.

We'll look for you at next year's Jamboree!

Charlie Garlow,  
EPA Office of Enforcement

### Recent Publication



*Pollution Prevention Technologies for the Bleached Kraft Segment of the U.S. Pulp and Paper Industry* (EPA/600/R-93/110, August 1993, 177 pages) is a technical study on the adoption of selected source reduction technologies in this industry and the impacts on mill operations and pollutant loadings. Available through the Pollution Prevention Information Clearinghouse, tel: 202-260-1023, fax: 202-260-0178.

### Pesticides

(Continued from page 1)

standard, which does not allow carcinogenic pesticides that concentrate in processed foods. EPA would identify within six months all pesticide residue levels on food that may exceed the safety standard. Most high risk pesticides will have to meet the safety standard within three years and all other pesticides will have to meet the standard within seven years.

The reforms will eliminate consideration of economic benefits in the pesticide review and approval process except in exceptional cases. Lower-risk pesticides will receive priority review for approval, and high-risk pesticide use will be reduced through the use of integrated pest management (IPM) techniques, which combine limited pesticide use with practices such as crop rotation, cultivation of predator insects, and use of biological pesticides. EPA would have the power to suspend

immediately the use of dangerous pesticides without having to undertake a lengthy cancellation action, and all pesticide registrations would "sunset" every fifteen years, to ensure that they meet current health standards.

The reforms would strengthen existing enforcement power, protect farm workers from hazards associated with pesticides, and prohibit the export of pesticides banned or withdrawn in the United States because of health concerns.

### Wet Cleaning

(Continued from page 1)

During the test, nearly 1500 garments were cleaned, roughly half with the wet process and half with conventional dry-cleaning. DfE then compared the cost, customer satisfaction, and fabric wear characteristics of the two groups. Eleven cost items differed between the two methods, including labor, equipment maintenance, electricity, hazardous waste disposal and capital cost. Although the wet process requires more skilled labor, this cost is offset by lower costs for equipment, hazardous waste

disposal, electricity, and supplies. In the end, the costs for wet cleaning were slightly lower than for dry.

Comparisons of customer satisfaction and fabric wear (including factors such as shrinkage, stretching, and color change) found little statistical difference between the two processes, but there was a statistically significant consumer preference for the reduced odor of the wet cleaning process. EPA will now go on to examine the full range of health and ecological risks associated with the wet cleaning process in order to determine whether it is a viable pollution prevention

option for the fabric cleaning industry.

For more information, contact the Pollution Prevention Information Clearinghouse at 202-260-1023.

*Related Notes:* In September, EPA announced regulations of PCE under the Clean Air Act that will require dry cleaners to use pollution control equipment and prevent leakage of the chemical. For information, contact George Smith at 919-541-1549. Conference proceedings from the International Roundtable on Pollution Prevention and Control in the Drycleaning Industry, held on May 27-28, 1992 are available for sale from NTIS. (Tel: 703-487-4650, order number PB93-102681, \$36.50.)



## Research Update

### Competitive Cooperative Agreements for Clean Technology Demonstrations

EPA's Pollution Prevention Research Branch (PPRB), has awarded three Competitive Cooperative Agreements totalling \$562,000 to fund six Clean Technology Demonstrations. The recipients and funded projects are: **University of Tennessee's** Clean Technology Demonstrations for 33/50 Chemicals; **University of Connecticut's Institute of Material Science** for "Alternative to Chrome Etching Processes for Metals"; **University of Massachusetts at Lowell** for "Evaluation of Alternative Surface Cleaning Methods"; **University of California at Los Angeles** for "Mercury Life Cycle and Pollution Prevention"; **University of Dayton** for "Reduction of Arsenic in the Semiconductor Industry"; and **Mississippi State University** for "Synergistic Wood Preservatives for Replacement of CCA". For further information contact Ivars Licis, 513-569-7718.



### Federal Cooperative Pollution Prevention Research

Federal cooperative pollution prevention research began back in 1988 with the Waste Reduction Evaluations at Federal Sites (WREAFS) Program. The first joint projects between EPA and other federal agencies consisted of over 26 pollution prevention opportunity assessments (PPOAs) within the Departments of Defense, Transportation, Veterans' Affairs, Energy, and Interior, which were very successful in identifying pollution prevention projects, many of which have been implemented.

Today's Federal Pollution Prevention Research Program has evolved from conducting PPOAs to conducting joint Research, Design and Development (RD&D) to enhance pollution prevention through technology transfer.

Current RD&D projects involve many agencies and facilities. At Tinker Air Force Base innovative brush plating

techniques are being demonstrated as an alternative to the use of chromium and nickel-cadmium alloys for electroplating. At Lackland AFB a substitute for xylene is being evaluated in Air Force Histopathology labs.

Under the WREAFS program, NASA and PPRB's Risk Reduction Engineering Labs developed a facility-wide pollution prevention plan for the Langley Research Center. Now they are moving to implement pollution prevention opportunities and projects identified under that plan. This past summer WREAFS sponsored the demonstration of a solvent-free technology for making advanced composite materials at the NASA-Langley Polymeric Materials Laboratory.

After completion of a pollution prevention plan at Ft. Eustis, the Army has identified the need for a customized material tracking system in order to better identify the flow of products and waste generating activities on base. WREAFS is sponsoring the development of this system in order to identify and target priority R&D needs in developing cleaner alternatives for Army operations service-wide. Additional joint pollution prevention RD&D projects are being discussed with AFCEE, NAWC-Indianapolis, the Army Corps of Engineers, and the US Coast Guard R&D Center.

Finally, PPRB is working with the Office of Federal Facilities Enforcement and the Regions to integrate pollution prevention solutions and options within the Federal Facility Multi-Media Environmental Compliance Initiative and enforcement settlements.

For more information, contact James S. Bridges, 513-569-7683.



### Combined Pollution Prevention/Energy Assessments

The Pollution Prevention Research Branch and the Department of Energy have agreed to fund six university centers to perform combined prevention/energy assessments at no charge to qualifying small to medium-

sized manufacturers. The six Industrial Assessment Centers will be located at **Colorado State University at Fort Collins**, **University of Tennessee**, **Texas A&M**, **Oregon State**, **University of Wisconsin at Milwaukee**, and **University of Massachusetts at Amherst**. These six university programs will conduct sixty combined assessments in FY94. Future plans call for incorporating pollution prevention into all existing energy audit locations after FY 1994, resulting in 40 Industrial Assessment Centers by FY96. For information, contact: Emma Lou George 513-569-7578.

### Recent Publications

(Available from the Center for Environmental Research Information, 513-569-7562)



A new guidance document prepared by the American Institute for Pollution

**Prevention, A Primer for Financial Analysis of Pollution Prevention Projects**, provides basic information on terminology and methods of performing financial analyses of proposed pollution prevention projects. It is intended to assist non-financial personnel in justifying proposed pollution prevention expenditures before a bank loan committee or an internal budgeting committee. (EPA/600/R-93/059)



To encourage designers to think holistically about product and process

design, EPA's Pollution Prevention Research Branch has issued a guidance manual, **Life Cycle Design: Environmental Requirements and the Product System**. Life cycle design is a proactive approach for combining pollution prevention and resource conservation strategies with the development of more ecologically and economically sustainable product design systems. (EPA/600/R-92/226)



## Calendar

Title	Sponsor	Date/Location	Contact
8th Nat'l. Conference on Household Hazardous Waste Mgt.	EPA, State of Vermont, SWANA	Nov. 6-10 Burlington, VT	301-585-2898 301-585-0297 (fax)
Biocycle South Central Conference	BioCycle Journal, Texas Natural Resource Conservation Commission	Nov. 8-10 Austin, TX	215-967-4135
Building With Value '93	Sustainable Building Collaborative	Nov. 12-13 Seattle, WA	503-234-6931
Microscale Laboratory Workshop	Merrimack College, others	Nov. 12-14 North Andover, MA	NMCC 508-837-5000, x 4384
Prevention and Reduction of Acid Wastes	Massachusetts OTA, EPA	Nov. 17 Sturbridge, MA	Don Harris 214-943-8024
Pollution Prevention Courses: Assessment and Economics Chemicals and Polymer Industry	Univ. of New Hampshire	Nov. 18: Nashua, NH Dec. 13: Nashua, NH	Continuing Educ. 603-862-1088
Water: Our Next Crisis	Academy of Natural Sciences	Jan. 12-13, 1994 Philadelphia, PA	Rob Goldberg 215-299-1108

## Prevention Strategies for Sustainable Development

NATO's Committee on the Challenges to Modern Society (CCMS) will be sponsoring a workshop, *Global Perspectives on Pollution Prevention*, in Nashville, TN, on November 4 and 5, 1994, in conjunction with the National Roundtable of State Pollution Prevention Programs' conference. Speakers from The Netherlands, Turkey, Greece, Denmark, Sweden, Iceland, the

U.S. and several international agencies will present pollution prevention case studies and policy initiatives from their respective countries.

EPA is working with CCMS and participants from 16 other countries to share information on pollution prevention strategies and technologies from around the world. To date, this pilot project, Pollution Prevention Strategies

for Sustainable Development, has sponsored policy and technology workshops in Rome, Italy; Graz, Austria; and Cesme, Turkey.

For more information, or to obtain proceedings from previous meetings, please contact the EPA pilot study co-directors, Harry Freeman, 513-569-7529, or Deborah Hanlon, 202-260-4524.

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