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Programs Help Companies Reduce Waste

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HWRIC’s Programs & Services

Fall 1989

About HWRIC

This is the first issue of Illinois HWRIC Update, a newsletter produced by the Illinois Hazardous Waste Research and Information Center (HWRIC).

HWRIC is part of the Illinois Department of Energy and Natural Resources. It combines research and education; information collection, analysis and dissemination; and direct technical assistance to industry, agribusiness and communities in a multidisciplinary approach to better manage the state’s hazardous wastes and solve problems associated with it.

Promoting waste reduction and minimization is a primary goal.

HWRIC’s Five Programs

* Research
* Industrial & Technical Assistance (ITA)
* Information Services
* Laboratory Services
* Data Management

federal funding, we have launched a cooperative program with IEPA aimed at waste reduction training and become one of six states to receive funding for a three-year engineering evaluation program,” Thomas explained. “The Toxic Pollu-
Programs Launched With Federal Funding

(Continued from page 1)

tion Prevention Assistance Program will enable us to intensify and focus our waste reduction efforts.”

Training is a crucial step in initiating waste reduction. A joint HWRC and IEPA waste reduction training program funded through a federal contract (RCRA Integrated Training and Technical Assistance — RITTA) was launched in January 1989. Alisa Wickliff, HWRC Engineering Assistant, coordinated development of a waste reduction training program for the IEPA staff who enforce federal and state regulations.

“The IEPA staff we trained are a direct, first-step contact with businesses because they frequently visit companies and plants. They are responsible for approximately 2,000 hazardous waste generators in the state,” Wickliff said. “They are learning to look for waste reduction opportunities when they visit plants so they can help generators identify waste reduction techniques and strategies.”

HWRC and IEPA Join in Training Generators

HWRC engineers will modify the program this fall and provide it directly to companies, Wickliff said.

Waste Reduction Promoted Locally

Two community action agencies, with assistance from HWRC, are promoting waste reduction among local industries. Chicago’s Center for Neighborhood Technology (CNT) is helping electroplaters with waste reduction and will eventually make case studies available through computerized information systems now being developed.

Community Contacts, Inc. (CCI), is promoting waste reduction in Kane County through on-site visits and waste reduction audits. HWRC engineers provided waste minimization training to CCI staff, who are focusing assistance on printers and electroplaters. Questionnaire results reveal that more than half the respondents would like help in identifying waste reduction opportunities in plants. HWRC engineers will be working with these companies in coming months.

HWRC is accepting applications from industries — chemical companies, electroplaters, steelmakers, foundries, and printers — to participate in a three-year USEPA-funded project to evaluate innovative technologies.

A major goal of the WRITE (Waste Reduction Innovative Technology Evaluation) Program is to quantify reductions in the amount and toxicity of waste through the use of innovative technologies or techniques. The cost-effectiveness of these technologies will also be evaluated.

Companies will benefit by reducing wastes that require treatment or disposal, which in turn will reduce companies’ liability. Improved regulatory compliance will be another benefit. Participating companies will be featured at an international conference planned for June 1990 and at USEPA’s annual research symposium in April 1990.

Included among the 30 potential projects HWRC has identified so far are electroplating, printing, electronics, foundry, and solvent vendor industries. Waste streams from participating industries will be among the first samples analyzed in the Center’s new Hazardous Materials Laboratory, which is scheduled to open in spring 1990. For more information about the WRITE program, contact HWRC Assistant Director Dr. Gary D. Miller: (217) 333-8940.
HWRIC is accepting applications for the fourth annual Governor's Pollution Prevention Awards (formerly the Innovative Waste Reduction Awards), which are presented to Illinois generators who have significantly reduced the amount of waste they produce. Through the awards, Governor James R. Thompson and HWRIC hope to encourage generators to develop and use new waste reduction techniques or improve existing ones.

Matthew Folker (left) and Jennifer DuBurg: Moline Paint -- For waste reduction management strategies, material reuse, recycling, process modification.

Harry Pearson: Johnson & Johnson Health Care Co. -- For management strategies, raw material substitution, process modification. Reduced waste by 97.61 percent.

Dr. James Patterson: Illinois Institute of Technology -- For multimedia research involving air and water pollutants and waste. Focus is on in-plant control through recycling, recovery and reuse; process modification; clean manufacturing.

Lisa Mion and Jon Scholl: Illinois Agricultural Association -- For establishment of "Waste Not Recycling Program" that produces high-quality paper from waste paper. They have saved 19,228 trees since 1974.

Awards are presented in four categories: large businesses (100 or more employees), small businesses (99 or fewer employees), community organizations, and educational institutions. Applicants must fill out a form and submit a detailed description of their waste reduction programs. For information, call Alisa Wickliff (217) 244-8905. The application deadline is February 2, 1990.

1988 Award Winners

HWRIC helps Illinois businesses, communities, hospitals, agribusinesses, citizens' groups, schools and trade associations find ways to better manage and reduce the generation of hazardous wastes. For more information about these services, contact HWRIC's Industrial and Technical Assistance Program at (217) 333-8940.

Technical Assistance and Services

- Direct Technical Assistance and On-site Consultations: HWRIC's engineers provide suggestions for better waste management, process changes, and regulatory compliance.

- Waste Reduction Assistance: HWRIC staff provide waste reduction information and help generators implement waste reduction programs to meet their individual needs.

- Outreach: HWRIC sponsors hazardous waste management workshops and seminars, and our staff frequently give presentations at meetings around the state. Our staff also produce technical publications to help generators with commonly encountered problems.

- Matching Funds for Waste Reduction Technology: HWRIC provides up to $50,000 in matching funds to firms for developing practical methods of recycling or reducing the generation of hazardous waste in their plants.

- Regulatory Assistance: HWRIC helps generators understand regulations and better comply with them.

- Referral Service: HWRIC keeps lists of TSD facilities, laboratories and other consultants and sources of help and can provide these by geographical area. (HWRIC does not endorse any companies, however.)
HWRIC-Funded Research

**Reports Available**


"A Preliminary Environmental Assessment of the Contamination Associated with Lake Calumet." Ross, et al. (RR-019).


**Recently Completed and Current Research**


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**Pollutants Discharged Into Lake Calumet**

*Tighter controls on discharge from rivers, landfills and other sources needed*

Drainage outlet from Interstate 94. Drainage from I-94 and adjacent landfills and roads was the largest measured source of arsenic, lead, and chromium to Lake Calumet -- over 4 pounds per hour on one day during a rain storm. (Photo: W. Fitzpatrick)

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In 1987, scientists from the Illinois Scientific Surveys, with funding from HWRIC, found that Lake Calumet-area pollution has created a "seriously disturbed ecosystem." For more than a century, the Lake Calumet area has been a dumping ground for the steel mills, chemical plants and other industries located there and for mountains of municipal waste from Chicago. As a result, the area has one of the highest concentrations of hazardous waste sites in the nation; USEPA has investigated 42 as potential Superfund sites. The sheer number of disposal sites — legal and illegal, active and closed — and the long history of industrial activity in the area create a complex puzzle for scientists studying pollution in the region.

In another HWRIC-funded study, State Water Survey researchers Dr. Nani Bhowmik and William Fitzpatrick are adding important clues to the riddle of how contaminants reach Lake Calumet and to what extent they may threaten people and wildlife in the region.

Their study shows that surface waters — streams, highway runoff, sewer discharges, and drainage ditches — play an important role in transporting contaminants into Lake Calumet. Moreover, some believe these pollutants may threaten the quality of Lake Michigan waters.

"Our study shows that Lake Calumet and the wetlands east of the lake receive significant quantities of pollutants from streams and sewers," Fitzpatrick explained.

**Toxic Metals Exceed Standards**

Some of the data taken during storms are dramatic. Concentrations of toxic metals (zinc, chromium, cadmium and lead) were well above established water quality standards. In one case the inflow of toxic metals to Lake Calumet's northeast wetlands was 322 pounds per hour. At another site, sewer and over-

(Continued on pg. 8)
Since 1985, HWRIC has funded 85 research projects on a broad range of hazardous waste-related topics. Selected field projects are listed below. Reports are available free of charge (unless otherwise noted) for projects with numbers following the titles. To order, call HWRIC (217) 333-8940.

1. Rockford


“A Regional Ground-Water Characterization of the Rockford Area, Winnebago County, Illinois.” (HWRIC RR-027)

“Source Tracing of Heavy Metals in the Rock River through Analysis of Sediments and Biota.”

2. Waukegan Harbor

“Assessment of the Ecotoxicological Hazard of Sediments in Waukegan Harbor, Illinois.” (HWRIC RR-018)


“An Amendment for Assessment of Ecotoxicological Hazard of Waukegan Harbor Sediments.”

3. Illinois Waterways

“Risk Assessment of the Potential for Hazardous Spills in Illinois Waterways.” The rivers being studied are highlighted.

4. The Calumet Area

HWRIC has funded several projects in the Calumet area. They are listed on the facing page.

5. Champaign

“Participation in a Household Hazardous Waste Collection Drive and ‘Before’ and ‘After’ Public Knowledge and Disposal Practices.” (HWRIC RR-025) $13.00

6. Galesville

“Assessment of Problems Associated with Landfilling or Land Application of Pesticide Wastes and Feasibility of Cleanup by Microbiological Degradation.”

“Development of Sampling Protocol for Organics in Fine Grain Materials.”

7. Wilsonville

“Ground-Water Monitoring and Modeling with Biodegradation of Organic Pollutants at Wilsonville Waste Disposal Site.”

8. East St. Louis

“Atmospheric Research and Monitoring Study of Hazardous Substances: Third Annual Report.” (HWRIC RR-022)

“Historical Assessment of Hazardous Waste Management in Madison and St. Clair Counties, IL 1890-1980.” (HWRIC RR-030)

9. Crab Orchard Lake

“Seasonal & Spatial Pattern Analysis of PCB Contamination of Fishes in Crab Orchard Lake.”

“Levels of PCBs and Trace Metals in Crab Orchard Lake Sediment, Benthos, Zooplankton and Fish.”
The HWRIC Library comprises a growing collection of hazardous waste-related publications that currently includes 1500 books and 150 journals. As the only library in Illinois dedicated to hazardous waste information, it is an important resource for hazardous waste research.

Special effort is being made to collect materials related to waste reduction; recent additions include a number of waste audit manuals for industries ranging from automotive to electroplating. An up-to-date bibliography of the Library's waste reduction holdings is available.

Although the HWRIC Library collection does not circulate, anyone may use the materials on site, and library-to-library loans can be arranged. Library hours are 8:00 a.m. to 5:00 p.m. Monday through Friday. For more information call (217) 333-8957.

HWRIC's Clearinghouse contains multiple copies of brochures, reports, fact sheets, booklets, and engineering and waste reduction case studies. Single copies are provided to anyone requesting them (most are free).

The collection contains over 200 titles in 24 categories and includes a broad range of materials from highly technical publications to publications for nontechnical readers covering topics such as household hazardous waste, ground water, and pesticides. There are even materials for schoolchildren.

Expanding the collection's waste reduction holdings, especially engineering case studies and industry-specific fact sheets, will be given special emphasis in the coming months. For more information or for a list of the HWRIC Clearinghouse holdings, call (217) 244-8901.

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Waste Reduction Publications Available

These publications are available free from the HWRIC Clearinghouse: (217) 244-8901

- Hazardous Waste Reduction: The Bottom Line (Water Pollution Control Federation: Brochure).
- Recycle (USEPA: Brochure).
HAZARDOUS MATERIALS LABORATORY
TO OPEN SPRING 1990

HWRC will move into its new home on the University of Illinois Urbana-Champaign campus in early spring 1990, when construction of the $9 million Hazardous Materials Laboratory (HML) is completed. The HML is a state-of-the-art research and training facility designed specifically for safely conducting research on hazardous materials and wastes.

The building consists of over 20,000 square feet of laboratories and an administrative wing. The laboratory wing comprises 16 specialized laboratories, which will allow scientists to conduct experiments on the cutting edge of hazardous waste research and technology. The HML also offers instrumentation and equipment not presently available at many other research facilities.

“Our plan is to make the facility available to the hazardous materials research community. To my knowledge, this is the only Illinois research institution that will be operated in this manner,” Laboratory Services Manager Dr. Marvin D. Piwoni explained.

HWRC offers several resources to scientists using the HML: potential funding for waste-related study, data analysis for projects, data quality control, a library and clearinghouse of waste-related materials, access to the University of Illinois library system, and analytical support, including supplies and personnel.

Many HML users will come from state and university research institutions. "I think the HML’s primary users will be from the State Scientific Surveys and the University of Illinois," Piwoni said.

Industry will also play an important research role at the HML. HWRC welcomes cooperative research and development efforts with industry and encourages businesses to join the "HML Industrial Affiliates Program." Industrial affiliates will be given special consideration for access to the HML’s facilities and representation on the Industrial Affiliates Advisory Panel will be offered. Panel members will be kept abreast of HWRC’s activities and make recommendations to the Center’s Research and ITA Programs.

The HML’s unique resources will enable HWRC to expand its hazardous waste management role in Illinois. The Center will expand its current programs and offer new waste management services for the public and private sectors.

The Center’s hazardous waste library will include more than 10,000 volumes and the clearinghouse will feature a comprehensive collection of waste reduction literature.

The new facility will enable HWRC’s technical staff and researchers to demonstrate waste reduction and alternative technologies. For example, the 1700-square-foot pilot lab provides facilities for evaluating waste treatment, recycling and waste reduction technologies at the pilot scale. The basement and second-story mezzanine will accommodate equipment up to 30 feet high for pilot-scale studies. Other areas of the HML will accommodate bench-scale projects and development of analytical techniques using state-of-the-art equipment.

The HML will also enable the Center’s Research and Laboratory Services staff to supervise and assist in many of the

Researchers from industry, government agencies, and universities will use the HML

HWRC-funded research projects conducted in the facility.

Construction of the building is nearly complete — Dr. Piwoni expects HWRC staff to move into the facility in mid March; the laboratories should be in full operation by September 1990.

For more information about the HML or research opportunities available in the facility, call Dr. Marvin D. Piwoni at (217) 333-8940.
land flow discharged 22,000 pounds per hour of sediment and over 7 pounds per hour of toxic metals to the lake. Pullman Creek, which receives drainage from Interstate 94 and adjacent landfills and roadsides, dumped more than 4 pounds per hour of arsenic, chromium and lead into the lake in one day.

**MSD Sludge Beds Source of Contaminants**

The researchers studied five regular drainage routes to Lake Calumet and its eastern wetlands. Although lake inflow came from expected sources, the levels and toxicity of contaminants were much higher than scientists expected.

"The most contaminated source came from the sludge-drying beds of the Metropolitan Sanitary District of Greater Chicago. One day during a heavy rainstorm, the flow coming off the beds at 107th and Stony Island Avenue equaled 59,600 pounds per hour of solids discharged into Lake Calumet's eastern wetlands," Fitzpatrick said. "At this rate, nearly 4 tons of toxic metals could be discharged into the lake in 24 hours."

Concern about the ongoing pollution is heightened by the fact that water flow patterns between Lake Calumet and Lake Michigan are not well understood. "Studies from the 1960s indicated that pollutants in Calumet Harbor could travel throughout the southwestern basin of Lake Michigan and impact public water supplies," Fitzpatrick said.

**Effects on Lake Michigan Need More Study**

The area's water flow patterns have since been altered and controlled, and a new study headed by Bhowmik and Fitzpatrick is underway to determine if Lake Calumet pollutants are reaching Lake Michigan.

Solving the area's pollution problems will not be easy. Studies are needed to understand more precisely what the contaminant sources and routes of transportation into Lake Calumet and its wetlands are.

"This study did not look at drainage from known toxic and hazardous waste dumps in the area," Fitzpatrick said. "It is only a first step in quantifying the level of pollution in the area since only a few of the many sources were examined.

"We did show that pollution is continuing and that it poses a potential threat to the environment and to the health of people who work, hunt, fish and recreate in the area. It also threatens native and migratory fish and wildlife."

For now, Fitzpatrick recommends that tighter controls of water pollution from landfills, sludge beds and sewer discharges be implemented. In addition, illegal dumping along Stony Island Avenue and Lake Calumet's eastern wetlands should be stopped.

A report summarizing this study will be available in December 1989.

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**ILLINOIS HWRC UPDATE**

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Address Correction Requested