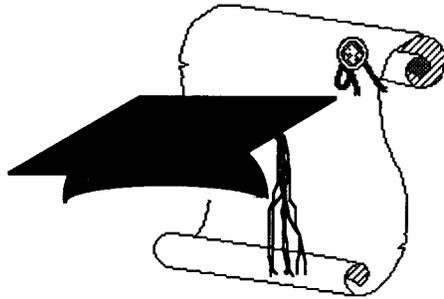
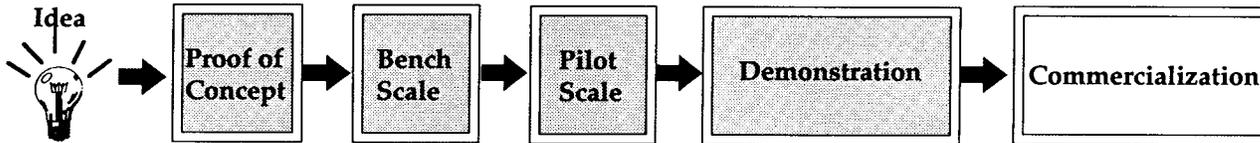


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# V. UNIVERSITY-AFFILIATED HAZARDOUS WASTE RESEARCH CENTERS



- **Enable developers to obtain multi-disciplinary technical expertise on an as-needed basis**
  - **Consulting support**
  - **Basic and applied research.**
- **Frequently less expensive than maintaining in-house expertise or procuring commercial services.**
- **University-based research has been a source of many innovative technologies.**



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University-affiliated research centers are an important source of both basic and applied research. The multi-disciplinary faculty and graduate students accessible through these research centers can provide scientific and engineering assistance to developers. These centers can also provide support for addressing associated technology requirements such as materials handling and emission controls.

EPA established the Hazardous Substance Research Center (HSRC) program to study all aspects of the manufacture, use, transportation, disposal, and management of hazardous substances, as well as the publication and dissemination of the results of such research. Five HSRCs have been funded, composed of geographically proximate universities that service pairs of EPA Regions. EPA has also provided funding for the Gulf Coast Hazardous Substance Research, Development, and Demonstration Center.

In addition, EPA provides funding under the Environmental Research Centers (ERC) program. Under this ERC program several universities are

conducting hazardous waste remediation research. EPA's Office of Exploratory Research is in the process of selecting additional universities to participate as ERCs.

In addition to EPA-funded research centers, many universities across the country have hazardous waste treatment expertise. This Section provides a partial list of universities that have identified themselves as having hazardous waste treatment expertise. The list of universities was extracted from the "Directory of Cooperative University/Industry Environmental Research and Development Centers," published by EPA's Office of Cooperative Environmental Management.

Hazardous waste treatment is a rapidly growing and evolving field. There are many universities that may be able to provide assistance in hazardous waste treatment research. Developers are encouraged to contact other universities, in addition to those listed in this booklet.

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## EPA-FUNDED HAZARDOUS WASTE RESEARCH CENTERS

**Name:** Northeast Hazardous Substance Research Center

**Address:** Northeast Hazardous Substance  
Research Center  
New Jersey Institute of Technology  
Newark, NJ 07103

**Director:** Richard S. Magee

**Phone:** (201) 596-3006

The Northeast Hazardous Substance Research Center (NHSRC) supports EPA Regions I and II. The Center's programs focus on the development and demonstration of remediation and treatment technologies. In particular, the Center concentrates on in-situ remediation techniques and incineration.

**Participating Institutions:** New Jersey Institute of Technology (NJIT), Massachusetts Institute of

Technology, Princeton University, Rutgers University, Stevens Institute of Technology, Tufts University, University of Medicine and Dentistry of New Jersey.

NJIT also serves as the lead institution for the Hazardous Substance Management Research Center (HSMRC), funded by the National Science Foundation and composed of many of the same institutions. The HSMRC performs research in hazardous waste treatment and administers New Jersey's Innovation Partnership (IP) Grant Program. IP provides funding to private developers for research at the HSMRC. Developers must match the funds provided through IP.

**Name:** Great Lakes and Mid-Atlantic Hazardous Substances Research Center

**Address:** Department of Civil Engineering  
181 Engineering Building 1-A  
College of Engineering  
The University of Michigan  
Ann Arbor, MI 48109-2125

**Director:** Walter J. Weber, Jr.

**Phone:** (313) 763-1464

The Great Lakes and Mid-Atlantic Hazardous Substance Research Center serves EPA Regions III

and V. The Center's research program focuses on remediating organic pollutants through integrating bioremediation with complementary chemical and physiochemical technologies. The Center groups these projects into three general categories: microbial degradation, pollutant properties affecting degradation, and engineered systems.

**Participating Institutions:** The University of Michigan, Michigan State University, Howard University.

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**EPA-FUNDED HAZARDOUS WASTE RESEARCH CENTERS (Cont'd)**

**Name: Waste Minimization and Management Center**

**Address:** Department of Chemical Engineering  
Box 7905  
North Carolina State University  
Raleigh, NC 27695-7905

**Director:** Michael Overcash

**Phone:** (919) 737-2325

minimization, transportation, treatment and management, and containment and clean-up.

**Participating Institutions:** North Carolina State University, The University of North Carolina, Chapel Hill, Texas A&M University, Galveston and College Station.

The Waste Minimization and Management Center services EPA Regions IV and VI. The Center's projects fall into the following categories: waste

**Name: Hazardous Substance Research Center for Regions VII and VIII**

**Address:** Department of Chemical Engineering  
Durland Hall  
Kansas State University  
Manhattan, KS 66506-5102

**Director:** Larry E. Erickson

**Phone:** (913) 532-5584

treatment, and reduction of hazardous substances resulting from agriculture, forestry, mining, mineral processing, and other activities of local relevance.

**Participating Institutions:** Kansas State University, Montana State University, University of Iowa, University of Missouri, University of Montana, University of Nebraska, University of Utah.

The Hazardous Substance Research Center for EPA Regions VII and VIII was established to conduct research pertaining to the identification, remediation,

**Name:** Western Region Hazardous Substance Research Center

**Address:** Department of Civil Engineering  
Stanford University  
Stanford, CA 94305-4020

**Director:** Perry McCarty  
**Phone:** (415) 723-4131

and biological processes for treating hazardous substances in the surface and subsurface environments. A major focus of the Center's research program is in groundwater treatment and remediation of subsurface contamination.

The Western Region Hazardous Substance Research Center services EPA Regions IX and X. The primary research focus for the Center is to support the development of alternative and advanced physical, chemical,

**Participating Institutions:** Stanford University, Oregon State University.

**Name:** Gulf Coast Hazardous Substances Research, Development, and Demonstration Center

**Address:** Lamar University  
P.O. Box 10613  
Beaumont, TX 77710

**Director:** William Crawley  
**Phone:** (409) 880-8707

waste management throughout the Gulf Coast through waste minimization and alternative technology development.

The Gulf Coast Hazardous Substance Research, Development, and Demonstration Center funded by EPA, was established under the Superfund Amendments and Reauthorization Act of 1986. The purpose of the Center is to conduct research to aid in more effective hazardous substance response and

**Participating Institutions:** Lamar University-Beaumont, Louisiana State University, Mississippi State University, Texas Engineering Experiment Station/TAMU, University of Alabama, University of Central Florida, University of Houston-University Park, University of Texas-Austin

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**EPA-FUNDED HAZARDOUS WASTE RESEARCH CENTERS (Cont'd)**

**Name:** National Center for Ground Water Research

**Address:** Department of Environmental  
Science and Engineering  
Rice University  
P.O. Box 1892  
Houston, TX 77251

**Director:** C.H. Ward  
**Phone:** (713) 527-4086

The Center for Ground Water Environmental  
Research receives funding from government and

private sectors. The Center focuses on factors affecting the fate and transport of subsurface pollutants and methods to assess and protect ground water. On-going work in in-situ bioremediation includes research on tolerance to high concentrations of hydrogen peroxide and factors influencing microbe mobility. The Center also conducts assessments and field demonstrations of various remedial technologies.

Participating Institutions: Rice University, University of Oklahoma, and Oklahoma State University.

**Name:** Hazardous Waste Research Center

**Address:** 3418 CEBA Building  
Louisiana State University  
Baton Rouge, LA 70803

**Contact:** Louis Thibodeaux  
**Phone:** (504) 388-6770

The HWRC, also an Environmental Research Center, conducts research on hazardous waste treatment and disposal. Research priorities include incineration, alternative methods of treatment, and

interaction between waste constituents and natural media. In addition to fundamental research, the Center conducts applied research and technology transfer. The applied research program fosters university-industry research and has included studies of nitric oxide, single cell cascade cross-flow air stripping of volatile organics from ground water, and dry sorbent injection to remove hydrogen chloride from air emissions.

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## UNIVERSITY-AFFILIATED HAZARDOUS WASTE RESEARCH CENTERS

**Name:** University of California, Los Angeles

**Address:** Center for Clean Technology  
School of Engineering and Applied  
Science  
7420 Boelter Hall  
405 Hilgard Avenue  
Los Angeles, CA 90024-1600

**Contact:** Robert J. LaPointe

**Phone:** (213) 206-0678

UCLA's Center for Clean Technology has established an Industrial Affiliates Program (IAP) to support its three government-funded environmental research centers:

- Engineering Research Center for Hazardous Substance Control
- National Center for Intermedia Transport Research
- Center for Risk and Systems Analysis for the Control of Toxics.

Participation in IAP enables firms to access and collaborate in university research projects. In addition, developers outside the IAP can access the UCLA faculty, specialized research capabilities, library and computing resources, students, and educational opportunities.

**Name:** Carnegie Mellon University

**Address:** Carnegie Mellon Research Institute  
4400 5th Avenue  
Pittsburgh, PA 15213

**Contact:** William Kaufman

**Phone:** (412) 268-3190

Carnegie Mellon Research Institute is an applied research organization that develops practical applications of technologies for industry and government. The Center's staff specializes in conducting research on biodegradation of waste materials. It also con-

ducts research in the areas of gas sensors and artificial intelligence concepts to be used as a tool in evaluating permit requests. The Center is primarily funded (85%) through industry sponsorships. The remaining funding is through government grants. In addition to providing research for a diverse group of sponsors, the Center also provides specialized capabilities to smaller companies that do not have access to such capabilities in-house.

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**UNIVERSITY-AFFILIATED HAZARDOUS WASTE RESEARCH CENTERS (Cont'd.)**

**Name: University of Cincinnati**

**Address:** Center for Hazardous Waste Research  
and Education  
Department of Civil and Environ-  
mental Engineering  
Cincinnati, OH 45221

**Contact:** Paul Bishop  
**Phone:** (513) 556-3648

Cincinnati conducts research on hazardous waste treatment technologies. Specific research projects have included: biological treatment using thin film bioreactors, solidification and stabilization of soils, reverse osmosis, hazardous waste composting, and wastewater treatment. The University is testing aerobic and anaerobic treatment methods in fluidized bed reactors using activated carbons as a support medium.

In addition to the services provided through EPA's Solid and Hazardous Waste Research Facility in Center Hill, Ohio (see Section IV), the University of

**Name: University of Florida**

**Address:** The Florida Center for Hazardous  
and Solid Waste Management  
3900 SW 63rd Boulevard  
Gainesville, FL 32608

**Contact:** James Bryant  
**Phone:** (904) 392-6264

Miami. Established by Florida legislation in 1988, the Center conducts research and provides education on hazardous waste management. Specific areas include: methods and processes for recycling, treating, and disposing of solid and hazardous waste. The University annually issues requests for pre-proposals from which it selects new research projects and appropriates funding based on the researcher receiving matching amounts from outside sources.

The University of Florida is the host institution for the Florida Center for Solid and Hazardous Waste Management. Participating universities include Florida State University, University of South Florida, University of Central Florida, Florida A&M University, Florida Atlantic University, Florida Institute of Technology, and the University of

**Name:** University of Illinois

**Address:** Advanced Environmental Control  
Technology Research Center  
3230 A Newmark C.E. Lab  
205 North Mathews Ave.  
Urbana, IL 61801

**Contact:** R. S. Engelbrecht  
**Phone:** (217) 333-3822

research focuses on physical, biological, and chemical treatment technologies for air and water pollution. Recent experimental research studies funded with EPA core support include: treatment applications of supercritical extraction; thermal regeneration of powdered activated carbon; development of the expanded-bed granular activated carbon anaerobic reactor for the treatment of hazardous wastes; and simultaneous collection of sulfur dioxide, nitrogen oxides, and hydrochloric acid.

The University of Illinois Advanced Environmental Control Technology Research Center conducts research in hazardous waste treatment. Specifically,

**Name:** New Mexico State University

**Address:** Waste Management and Research  
Consortium  
Chemical Engineering Department  
New Mexico State University  
Las Cruces, NM 88003

**Contact:** Ron Bhada  
**Phone:** (505) 646-1214

Alamos and Sandia national laboratories. The consortium conducts research in all areas of hazardous waste management. Currently, there are 34 projects in process including research on in-situ remediation and bioremediation of toxic wastes. The consortium is examining different technologies involving sensor instrumentation and robotics for cleaning up soils. University faculty and staff collaborate with industry and third parties in developing new technology. Requests for Proposals (RFPs) are sent out by the University that specify the research topic areas.

New Mexico State University is a member of the Waste Management and Research Consortium composed of University of New Mexico, New Mexico Institute of Mining and Technology, and Los

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**UNIVERSITY-AFFILIATED HAZARDOUS WASTE RESEARCH CENTERS (Cont'd.)**

**Name:** State University of New York at Buffalo

**Address:** Center for Hazardous Waste Management  
207 Jarvis Hall  
Buffalo, NY 14260

**Contact:** Ralph Rumer  
**Phone:** (716) 636-3446

The New York State Center for Hazardous Waste Management administers research projects directed at the development of strategies, technologies, and methods that will enable safe and permanent clean-up of inactive hazardous waste disposal sites in New York State. The Center reviews competitive propos-

als from university and private industry researchers aimed at the development of methods for permanent remediation of inactive waste disposal sites. Most of the research funds to date have been awarded to University investigators; however, the Center has provided co-funding to a private technology developer. In addition, the Center can locate principal investigators at the University to provide research and technical expertise to private technology developers. Current areas of site remediation research include: incineration/ash management, field studies, physical/chemical treatment, manufactured gas plant remediation, and biological treatment technologies.

**Name:** University of Pittsburgh

**Address:** Center for Hazardous Materials Research  
University of Pittsburgh Applied Research Center  
320 William Pitt Way  
Pittsburgh, PA 15238

**Contacts:** Edgar Berkey  
Timothy Foss Delgado  
**Phone:** (412) 826-5320

The Center for Hazardous Materials Research (CHMR) conducts a wide range of environmental

research, including the development and implementation of new technologies for hazardous waste management and remediation. CHMR's facility includes offices, laboratories, and pilot plants. CHMR's multi-disciplinary staff have industrial experience with large and small companies, as well as regulatory experience at both the Federal and State level. CHMR can also provide independent testing and evaluation of innovative remedial technologies, equipment, and procedures.

**Name:** University of Tennessee

**Address:** Center for Environmental  
Biotechnology  
Energy, Environment and  
Resources Center  
327 South Stadium Hall  
Knoxville, TN 37996-0710

**Contact:** Gary Saylor  
**Phone:** (615) 974-4251

The Center for Environmental Biotechnology (CEB) focuses on training and research leading to the development and effective use of microorganisms for

environmental remediation. CEB has offices for over 70 environmental services companies, 30,000 square feet of fully equipped research space, with 15,000 square feet as a single laboratory facility exclusively for environmental research and biotechnology. CEB receives Federal, industrial, and University support to conduct research activities. Ongoing investigations include: molecular probe development for monitoring and optimizing TCE degradation; molecular methods for quantifying microbial PAH degradation in manufactured gas plant soil; and bioluminescent sensor technology for on line in-situ measurement of biodegradation.

**Name:** University of Waterloo

**Address:** Waterloo Center for Groundwater  
Research  
Waterloo, ONT Canada N2L3G1

**Contact:** David Smyth  
**Phone:** (519) 888-4516

The Waterloo Center is the largest groundwater research center in Canada. The Center is also affiliated with other university and non-university research groups in Canada. The Center performs field research,

laboratory testing, and computer modeling research in organic and inorganic contaminant hydrogeology. Areas of research and testing expertise at the Center include processes of contaminant movement through subsurfaces, fate of contaminants, and remediation technology. Center facilities include experimental laboratories and analytical capabilities. Of particular interest to developers is the availability of field sites at which testing is conducted on the behavior, fate, and remediation of contaminants in the subsurface.