

Mission: Possible
Center of Excellence for Hazardous Materials Management

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ABSTRACT

The Center of Excellence for Hazardous Materials Management (CEHMM) was established in May 2004 as a nonprofit research organization. Its purpose is to develop a sustainable technical/scientific community located in Carlsbad, New Mexico, that interacts worldwide to find solutions to hazardous materials management issues. An important part of the mission is to achieve improved protection of worker safety, human health, and the environment.

Carlsbad has a large technical community due to the presence of the Waste Isolation Pilot Plant (WIPP) and its many contractors and support organizations. These groups include the Carlsbad Environmental Monitoring and Research Center, Washington Group International, Los Alamos National Laboratory, and Sandia National Laboratories. These organizations form the basis of a unique knowledge community with strengths in many areas, such as geosciences, actinide chemistry, environmental monitoring, and waste transportation. CEHMM works cooperatively with these organizations and others to develop projects that will maintain this knowledge community beyond the projected closure date of WIPP.

At present, there is an emphasis in biomonitoring, air monitoring, hazardous materials educational programs, and endangered species remediation. CEHMM is also currently working with a group from the American Nuclear Society to help facilitate their conference scheduled for April 2006 in Carlsbad. CEHMM is growing rapidly and is looking forward to a diverse array of new projects.

INTRODUCTION

Good morning, Mr. Phelps. Your mission, should you choose to accept it, is to create an organization in Carlsbad, New Mexico, called the Center of Excellence for Hazardous Materials Management. The Center (whose long name you will shorten to "CEHMM") will become a well known not-for-profit research organization. You will locate it in the small community of Carlsbad, New Mexico, near the Waste Isolation Pilot Plant (WIPP.)

Carlsbad, a city of about 25,000 people, is economically dependent on the 800 to 900 primary jobs provided by WIPP. Carlsbad and southeast New Mexico need to diversify and build on the waste management technology they have developed and lessen their dependence on the WIPP project. The planned closure of WIPP was originally projected to be approximately 30 to 35 years in the future, but the Department of Energy (DOE) has accelerated the project and the current planned closure date is closer to 15 years. As WIPP works hard to complete its

“Accelerated Mission,” there will be fewer technical resources for the community to build on due to the reduction of staffing as the repository fills. Your mission, Mr. Phelps, includes developing projects within CEHMM so that Carlsbad can retain its technical knowledge community during and after the closure phase of WIPP.

Your incentives are a \$2 million grant from the Department of Energy earmarked for research along the U.S.-Mexico border. Your initial task is to prove to the DOE that you have created a viable business structure including a financial management plan, policies and benefits to attract experienced scientists and professionals in the waste management field, and an exemption from the Internal Revenue Service (IRS) to operate as an IRS 510(c)(3) not-for-profit research organization. When these activities are complete and approved by audit, you may proceed with technical work.

Initial technical work shall focus on reducing hazardous effluents along the U.S.-Mexico border region. In keeping with your not-for-profit status, the public should be aware of your organization and accomplishments. You should have a web site with appropriate technical information and you should plan to publish a technical journal. Emphasis should be placed on identifying and sponsoring regional technical conferences. The web site, www.cehmm.org, should also be a forum for identifying and enrolling students in hazardous materials training courses.

Your actions should be in concert with community organizations and businesses, notably those organizations directly and indirectly associated with WIPP. WIPP's mission is to bury transuranic wastes. Your mission is not limited to radiological issues, but shall include hazardous materials management in general. Los Alamos and Sandia National Laboratories, the Carlsbad Environmental Monitoring and Research Center (CEMRC), New Mexico State University-Carlsbad, Washington TRU Solutions, Carlsbad Technical Assistant Contractors (CTAC), the Carlsbad Department of Development (CDOD) and many other private businesses and organizations will help partner and develop projects.

A Board of Directors and Technical Advisory Council (TAC) will assist in developing project ideas and networking within the community and the State of New Mexico. Nearly all of the New Mexico universities will have TAC representation along with professionals in environmental surveillance and regulation, air monitoring, geology, hydrology, epidemiology, toxicology, biological effects research, risk management, education, and cooperative conservation, particularly as related to endangered species. Your Board will be a great asset and will be composed of community and national leaders familiar with the waste management field.

And finally, Mr. Phelps, should you or any of your major ideas fail, then the agency will disavow knowledge and financial support for CEHMM. In the next several years, CEHMM should diversify its funding base and begin to be less and less dependent on DOE grants for projects. CEHMM should strengthen its alliances with universities, government agencies, and private organizations in order to carry on the important regional legacy of hazardous materials management and contribute to the economic stability of the region.

THE PROJECTS

The imaginary Mr. Phelps and his team took on seemingly unreasonable tasks in the 1960s television series *Mission Impossible*. Through hard work, ingenuity, and advanced technological means, the mission was always successful, although there were many challenges to the group. CEHMM has a challenging task to become a self-sustaining research organization, but the future is very bright and the prospects for success are great.

CEHMM was founded in May 2004 as a non-profit organization. In September 2004, DOE awarded CEHMM a grant to establish the organization and to continue waste effluent reduction work along the U.S.-Mexico border. In September 2005, DOE gave approval for CEHMM to begin technical projects as defined in the original grant and awarded CEHMM a second grant with a much broader technical scope of work. By December 2005, CEHMM had 10 full-time employees and planned to add an additional four to five scientists or technical professionals within the next six months.

The bylaws require a Board of Directors, Technical Advisory Council, and an appropriate administrative staff. The Board has approved development of technical work in five areas:

- Information Technology
- Education
- Cooperative Conservation
- Risk Management
- Research and Development

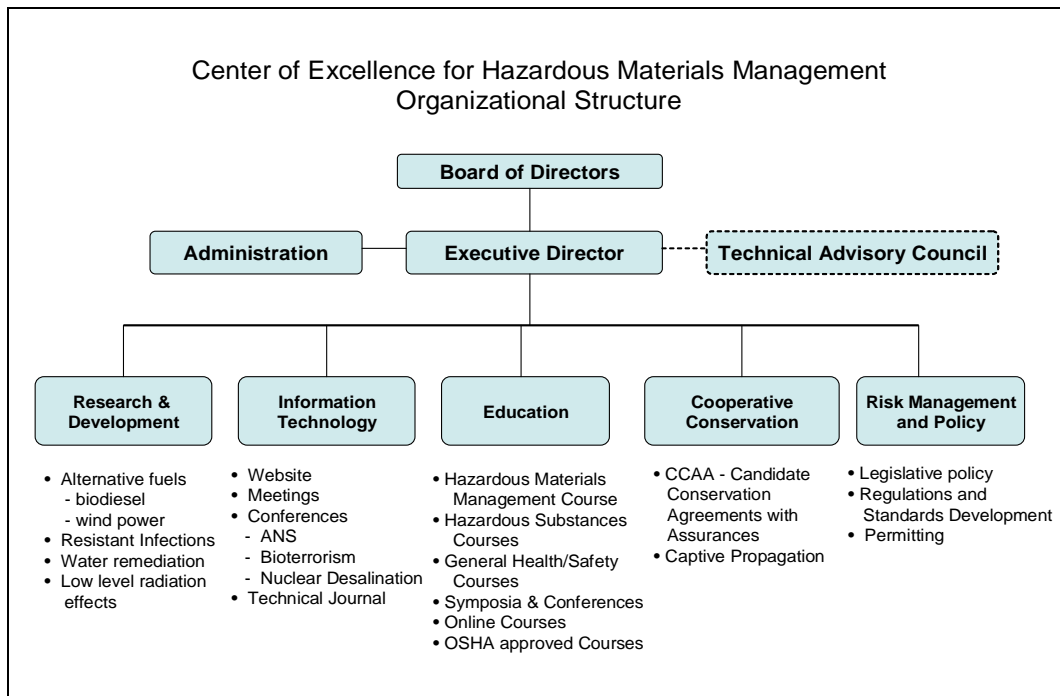


Fig. 1. Center of Excellence for Hazardous Materials Management organizational structure

Information Technology

The Information Technology (IT) group was authorized by DOE in May 2005 to satisfy the grant requirement to communicate project results and information to the public. The web site offers education course enrollment, technical paper publishing, and carries articles and information relevant to hazardous materials management. The best thing to say about a web site is “try it!” (www.cehmm.org)

Education

In September 2005, DOE approved the project scope for most of the grant work. Education is a high organizational priority. CEHMM has received permission to operate as a committee of the Albuquerque Chapter of the New Mexico Society of Hazardous Materials Managers. By means of this committee designation, the Center is authorized to provide the National Overview Course developed by the Academy of Certified Hazardous Materials Managers in Carlsbad, New Mexico. A Monday-through-Friday, five day format is planned, including three days for the course, one day to review examination questions, and testing on the morning of the fifth day.

CEHMM has formed an alliance with the Professional and Regulatory Training division of the Texas Engineering Extension Service (TEEX), which delivers OSHA-approved training courses to workers and supervisors. TEEX has a catalog of more than 40 OSHA and other health and safety courses that can be offered regularly throughout the region. The goal of this project is to enhance the technical skills of employed workers and those entering the workforce while helping employers adopt new approaches to improve productivity and profits.

Education will be a CEHMM mainstay and should provide long-term revenues for overhead. Prospects will depend on the market and the continuing need for safety training.

Research and Development

The Technical Advisory Council and other organizations have proposed many research ideas that are potentially viable. Production of biodiesel was selected for initial work because of high community interest and the potential for follow-up work in commercial development and agricultural and toxicological studies.

This endeavor requires participation from restaurants that use oil for frying. Once these oils have exhausted their usefulness for cooking, they become a resource for the production of alternative fuels such as biodiesel or biofuel blends. Local restaurants are cooperating with CEHMM by contributing their used oils. These waste vegetable (fry) oils, or WVOs, will be transformed into two different biofuels.

One of the fuel types, biodiesel, has received national attention because of its positive environmental and user-friendly qualities (low to no harmful emissions, prolonged engine life, better mileage). Biodiesel is manufactured by converting vegetable oil to methyl-ester by way of esterification.

The second fuel type is an amended vegetable oil blend that requires no esterification. This fuel type requires a thinning of vegetable oil with additives that not only lower the viscosity, but also add the chemicals (e.g., cetane) needed for pressurized combustion.

These fuels will be sent to an independent lab for analysis regarding fuel quality. Once the analytical results have been received, CEHMM will continue its research by fitting test vehicles with emissions and performance test devices. Once the optimum fuel has been determined, these results will be published on the CEHMM web site for public review.

Cooperative Conservation

To address the issues of toxins in the environment, CEHMM has proposed to work with threatened species in various ways. CEHMM and a working group consisting of the U.S. Fish and Wildlife Service (FWS), the New Mexico State Land Office, the New Mexico Department of Game and Fish, and the Natural Resources Conservation Service has developed a unique cooperative conservation strategy by drafting a Candidate Conservation Agreement with Assurances (CCAA) between CEHMM and the FWS. CCAs were originally developed to provide a level of protection for landowners if they owned habitat either occupied by a threatened/endangered species, or a species warranted for listing. The conservation goal of this agreement is to encourage development and protection of suitable species that inhabit non-federal lands in Chaves, Lea, and Eddy counties of New Mexico. This goal will be met by giving private landowners incentives to implement conservation measures and by providing landowners with regulatory certainty concerning land use restrictions that might otherwise apply should the species become listed under the Endangered Species Act. The FWS has empowered CEHMM, by way of the CCAA, to recruit and enlist property owners who qualify by way of certificates of inclusion.

Risk Management and Policy

Activities in this subject area are planned, but have yet to begin. Anticipated project areas include legislative policy, regulations and standards development, and permitting. The CEHMM Board and the Technical Advisory Council will convene a working group to direct project development.

CONCLUSION

In a *Mission: Impossible* kind of world, CEHMM is creating possibilities. The organization is actively pursuing projects in broad subject areas with the intention of creating self-sustaining technical work and retaining the unique knowledge community that has gathered in southeastern New Mexico to support the WIPP project. The area economy is dependent on a federally funded project that has planned closure as part of its mission. As evidenced in similar scenarios across the nation, economic recovery following plant closures requires sustained and focused effort.

CEHMM is carefully investing in the future of the area and this effort will pay substantial returns to the economy while adding value to existing resources. As WIPP closure draws near, it is anticipated that CEHMM projects will have grown and matured and will keep the area on the cutting edge of science and help the local economy cope with the decline of both the resource-

WM'06 Conference, February 26-March 2, 2006, Tucson, AZ

dependent jobs in the nearby potash mines and the decline in the number of WIPP jobs. WIPP is the only project of its kind in the world and CEHMM is using the pioneering spirit of the people who have worked to make it a success to fuel a whole new generation of projects benefiting the health and safety of both people and our environment.