

Rocky Mountain Regional HSRC

Administration

Charles D. Shackelford

Center Director
Colorado State University

Donald L. Macalady

Associate Director
Colorado School of Mines

Sandra L. Woods

Associate Director
Colorado State University

Outreach

Sandra L. Woods

Associate Director, Outreach
Colorado State University

Thomas R. Wildeman

Associate Director, Technical Transfer
Colorado School of Mines

Karl E. Burgher

Project Manager, TOSC/TAB
Montana Tech of the University of Montana

Kevin L. Mellott

Associate Project Manager, TOSC/TAB
Montana Tech of the University of Montana

For further information contact:

Linda L. Hinshaw

Assistant to the Director
Rocky Mountain Regional HSRC
c/o Department of Civil Engineering
Colorado State University
A203C Engineering Building
Fort Collins, CO 80523-1372
Tel: (970) 491-3381/6081
Fax: (970) 491-7727
lhinshaw@engr.colostate.edu

Investigators/Participants of the Rocky Mountain Regional HSRC

Colorado State University:

Rajiv Bhadra	Chemical & Bioresource Engineering
Brian Bledsoe	Civil Engineering
Kenneth Carlson	Civil Engineering
William Clements	Fish & Wildlife Biology
Nancy DuTeau	Microbiology
Pierre Julien	Civil Engineering
Elizabeth Pilon-Smits	Biology
Kenneth Reardon	Chemical & Bioresource Engineering
Edward Redente	Rangeland Ecosystem Science
Charles Shackelford	Civil Engineering
Chester Watson	Civil Engineering
Sandra Woods	Civil Engineering
Raymond Yang	Environmental Health

Colorado School of Mines:

Dianne Ahmann	Environmental Science and Engineering
Ronald Cohen	Environmental Science and Engineering
Linda Figueroa	Environmental Science and Engineering
Bruce Honeyman	Environmental Science and Engineering
Tissa Illangasekare	Environmental Science and Engineering
Donald Macalady	Chemistry and Geochemistry
Junko Munkata Marr	Environmental Science and Engineering
Harold Olsen	Geology & Geological Engineering
James Ranville	Chemistry and Geochemistry
Robert Siegrist	Environmental Science and Engineering
Thomas Wildeman	Chemistry and Geochemistry

Montana Tech of the University of Montana

Karl Burgher	Mining Engineering
Kevin Mellott	MWTP Programming

Other Investigators/Participants:

George Aiken	USGS
M. Katherine Banks	Purdue University
Craig Benson	University of Wisconsin - Madison
David Blowes	University of Waterloo, Canada
John Garbarino	USGS
Joseph Meyer	University of Wyoming
Danny Reible	Louisiana State University
A. Paul Schwab	Purdue University
Otto Stein, Jr.	Montana State University
Richard Wanty	USGS
John Westall	Oregon State University



Colorado State University
Fort Collins, CO



Colorado School of Mines
Golden, CO



Montana Tech of the University of Montana
Butte, MT

www.engr.colostate.edu/hsrc/

Rocky Mountain Regional Hazardous Substance Research Center
Colorado State University
A203C Engineering Building
Fort Collins, CO 80523-1372

Visit our Web site at: <http://www.engr.colostate.edu/hsrc/>

Program Background

The Rocky Mountain Regional Hazardous Substance Research Center (HSRC) for remediation of mine-waste sites was formed on November 1, 2001, through funding from the U.S. Environmental Protection Agency (EPA). The Rocky Mountain Regional HSRC consists of a consortium of participants from Colorado State University, Colorado School of Mines, Montana Tech of the University of Montana, and several academic and non-academic participants from other regions of the U.S. and Canada.

The Rocky Mountain Regional HSRC consists of two primary components: research and outreach. The research goal of the Rocky Mountain Regional HSRC is to develop new and to improve existing methods or technologies for remediation of mine waste sites that are cost effective and lead to clean-ups that are protective of human health and the environment. The outreach activities of the Rocky Mountain Regional HSRC include technology transfer, technical outreach and service to communities (TOSC), and technical assistance for brownfields (TAB). Technology transfer includes such activities as conferences, short courses, workshops, and field demonstrations, with a specific emphasis on the development of new technologies. The TOSC and TAB programs provide educational information to allow communities to make informed decisions concerning environmental contamination, and will provide technical assistance to communities and other stakeholders including the redeveloping of brownfields sites. Unlike the research component of the Rocky Mountain Regional HSRC, outreach activities are not necessarily restricted to mine-waste sites.

The Rocky Mountain Regional HSRC officially represents EPA Region 8 states (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming). However, the activities of the Rocky Mountain Regional HSRC also pertain to any location within the U. S., particularly where remediation of mine waste is required and/or where there is metals contamination.

Research Focus Areas

The Center focuses on the geochemical, biological, hydrological/mineralogical and engineering aspects of environmental problems associated with mining and mine wastes with the goal of developing new or improved remediation methods or technologies that are cost effective and lead to clean-ups that are protective of human health and the environment. A common theme among environmental problems associated with mining and mine wastes is contamination of all media (air, ground water, soil, sediments, and surface water) resulting from a host of metals, primarily As, Cd, Cu, Mn, Mo, Pb, and Zn, and a wide variety of sources (e.g., acid drainage from adits and sulfide-bearing waste piles, exposed ore zones, heap-leach spoils, mine-waste piles and sediments, slag piles, fluvial tailings deposits, and tailings and waste-rock piles).

The types of contamination and the specific processes required to address mine-waste problems are identified within the structure of five focus areas: (1) site characterization and contaminant transport and transformation, (2) surface water and sediment transport, (3) treatment processes, (4) technologies, and (5) ecological and human health toxicity. Each of these focus areas is an essential component of the remediation process, and the associated research includes basic and applied research. Mathematical and physical models are used to better understand processes and to help extend the results of the basic research to field demonstrations and applications.



Tailings

Rico, CO



California Gulch

Leadville, CO

Outreach

Outreach for the Rocky Mountain Regional HSRC includes these programs:

- **Technology Transfer**

The primary goal of the Rocky Mountain Regional HSRC Technology Transfer Program is to provide effective training and technology transfer resulting in the progression of ideas from the laboratory to application. Cooperation among the five existing HSRCs (see www.hsrc.com) is critical to creating efficiencies that will allow the highest quality outreach programs. We are establishing partnerships with the other Centers to leverage their programs - while providing service to Region 8. Similarly, we are seeking to establish ties with the Technology Transfer Programs of the existing HSRCs to meet needs in other regions pertaining to mining wastes, metals contamination, and acid mine drainage.

The purpose of the Technology Transfer Program is to support the mission of the Rocky Mountain Regional HSRC by: (1) promoting organizational linkages, (2) ensuring outreach to industry, communities, and states, (3) facilitating the use of innovative means of information transfer, (4) supporting investigations at the interface of disciplines, (5) exploiting opportunities in science, engineering, and technology where the complexity of the research needs requires the advantages of scope, scale, duration, equipment, and facilities, and (6) capitalizing on diversity through involvement of under-represented groups.

The Center facilitates the progression of laboratory research to field applications by supporting activities that result in idea-generation, information-transfer, laboratory- and pilot-scale testing, field demonstrations and applications. Training and technology transfer activities are developed based on the needs of the stakeholders and incorporate face-to-face interaction and technologies, as appropriate.

The Rocky Mountain Regional HSRC meets each of the project objectives through the use of multi-disciplinary teams spanning multiple institutions, through linkages to existing HSRCs, and through the use of a wide variety of information-transfer media. The project will result in several activities that generate new ideas (i.e. annual Center meetings, joint research projects, seminars, etc.),

that transfer information (i.e. conference presentations, expansion of the Tailings and Mine Waste Conference, publications, Web sites, electronic and print-based newsletters), as well as activities that support and transfer information concerning laboratory-, pilot-, and field-scale applications.

- **Technical Outreach Services for Communities (TOSC)**

The TOSC program helps to guide communities through the environmental cleanup and site reuse process. TOSC is a no-cost, non-advocate technical assistance program by the HSRCs. TOSC uses the resources of researchers and professionals in environmental science and engineering from more than 30 major research universities to provide communities with the independent technical information they need to participate actively in solving environmental problems.

- **Technical Outreach for Brownfields Communities (TAB)**

Brownfields are abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. Brownfields can be located in urban, suburban, or rural areas. The EPA's Brownfields Initiative is an organized commitment to help communities revitalize such properties both environmentally and economically, mitigate potential health risks, and restore economic vitality to areas where brownfields exist.

Montana Tech of the University of Montana is our partner for TOSC/TAB

Montana Tech
1300 W. Park Street
Butte, MT 59701
(406) 496-4410

TOSC/TAB: (888) 848 2010

Karl E. Burgher
Project Manager
TOSC/TAB
RMRHSRC
kburgher@mtech.edu

Kevin L. Mellott
Assoc. Project Manager
TOSC/TAB
RMRHSRC
kmellott@mtech.edu