

Remediation of Acid Impaired Waters: From Idea to CRADA, and Beyond

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Abstract

The Idea

Four years ago The Conservation Fund's Freshwater Institute (FI) and the US Geological Survey's Biological Resources Division (USGS/BRD) were both searching for a more economical and efficient technology for remediating acid impaired waters than those currently available. The partners already had a long-term relationship conducting research in the area of aquaculture process control. The Institute was interested in developing a technology for reclaiming acid mine drainage for use as aquaculture supply water, and for pH control within recirculating aquaculture systems. The USGS/BRD's interest was from the angle of watershed restoration. The two partners combined their resources and developed prototypes that effectively achieved these goals. The technology uses pretreatment of the influent water with carbon dioxide and pulsed limestone beds. Limestone dissolution is greatly enhanced with this technology and the armoring common to other limestone-based treatment systems is eliminated. As the original idea was the intellectual property of the USGS/BRD, patents were applied for and successfully attained by the agency. Both partners were confident that this technology had commercial viability and decided to enter into a Cooperative Research and Development Agreement (CRADA) to further develop the technology. The CRADA provides the government researcher with an opportunity to receive funds for the additional research that is needed and provides the private cooperator access to federal intellectual properties and licensing options.

The CRADA

A key feature of the Technology Transfer Act of 1986, CRADAs encourage federal and non-federal parties to work together and make optimal use of their technical and financial resources. The CRADA acts as an incentive for commercialization of federally-developed technology. Operating within a CRADA, the non-federal partner provides resources such as funds, facilities, and personnel, while the federal partner provides similar resources, but no funds. The primary components of a CRADA are the Statement of Work and the General Provisions. The Statement of Work outlines the work to be conducted and the responsibilities of the individual parties while the General Provisions constitute the legal framework of the agreement.

Benefits of a CRADA

- Enables both partners to leverage their research budgets and optimize resource use.
- Provides a means for federal and non-federal partners to share expertise, ideas, and information in an environment that protects intellectual property.
- Provides industry with access to a wide range of expertise in many disciplines.
- Allows partners to agree to share intellectual property emerging from the effort.
- The government may protect information emerging from the CRADA from disclosure for up to five years, if this is desirable.

CRADA Steps

1. Technology/Partner Search
2. Determine Validity of Partner
3. Development and Negotiation of CRADA Terms and Statement of Work
4. Federal Administrative Review
5. Federal Administrative Approval
6. Post-Project Evaluation

The Beyond

There is a distinct need within the field of acid mine drainage (AMD) treatment for alternatives to conventional active AMD treatment. Creating a simple and economical AMD treatment technology that utilizes limestone instead of the caustic materials typically used in active treatment systems will fulfill the needs of this clientele. The CRADA is intended to make commercially relevant improvements to the configuration and mechanics of the current technology through additional engineering efforts and utilization of field test results. The parties anticipate that re-engineering and field testing of the technology will allow them to develop a practical, cost effective, and easy to use AMD treatment system that has appeal to a wide variety of potential users. If the engineering and testing develops as planned the Institute anticipates licensing the technology or any improvements.

The Freshwater Institute has recently partnered with the Canaan Valley Institute (CVI) to develop cooperative approaches among public and private stakeholders in order to solve problems associated with watershed restoration in the four-state region served by CVI. Using a “collective expertise” approach, they will focus on technical innovation and leveraging of funding resources to address regional water pollution problems and restore aquatic systems. Through this alliance, and within the framework of the CRADA, the Institute will be able to provide technical assistance to the USGS at the Friendship Hill Demonstration Site, and develop a second AMD remediation site using the Leetown Technology at Mill Run, an acid impaired stream in Allegany County, Maryland. The work at this site will benefit the local community through restoring the stream’s aquatic resources, while at the same time providing further opportunity to develop key aspects of the Leetown Technology.