

Texts Conducted on Treating Well Water

People in the central Pennsylvania village of Hollywood can't use their well water for drinking purposes.

It's sour water, partly because of the influence of acid mine drainage. Miles of streams in the region run red for the same reason, all the way down to the Susquehanna River.

The irony of the situation is that Hollywood is the site of a million dollar Mine Drainage Treatment Facility, run by Penn State.

A further irony: University scientists may soon have to curtail research on a new process for treating acid mine drainage (AMD), one that could result in an inexpensive "backyard" apparatus by which the well water in Hollywood, and in hundreds of other hamlets in Appalachia, could be made potable.

Development of the new process, called reverse osmosis, was funded at Penn State by a

grant from Rex-Nord, Inc., Milwaukee, in turn supported by the Office of Saline Water (USDI).

The latter agency's projects have been severely cut by recent federal moves to trim research funds.

"Commercial reverse osmosis equipment exists right now," says Dr Harold Lovell, director of the Mine Drainage Facility, "but it is designed to purify brackish and sea water and has not previously been tested, on an operational scale, to see what it might do to reclaim acidic water."

The testing was to involve intensive experimentation at the Mine Drainage Treatment Facility. That installation was opened three years ago under the sponsorship of the Environmental Protection Agency and the Pennsylvania Department of Environmental Resources, with Penn State in charge of research.

Microbiologists, sanitary engineers, biochemists and others from the University have

already provided new data on the workings of chemical and biological techniques for purification of AMD.

"These techniques are both reliable and effective and are being used today to curtail stream degradation," says Lovell, a mineral chemist, "but the product is still substandard when it comes to human consumption."

"We expect that reverse osmosis would provide the extra measure of purification so that treated mine drainage can be classified as 'excellent' and not merely 'all right' to drink."

Osmosis goes on in the body all the time. It is a method of moving liquids - nutrients, for instance, from the blood stream to body tissues.

It takes place because relatively pure liquids tend to move toward a region where there is high density, as provided by a high concentration of salts.

But to turn the flow around - reverse osmosis - takes pressure.

"In preliminary tests last summer," notes Lovell, "we used

pressure of around 400 pounds per square inch to force acidic water through a plastic membrane into a body of pure water.

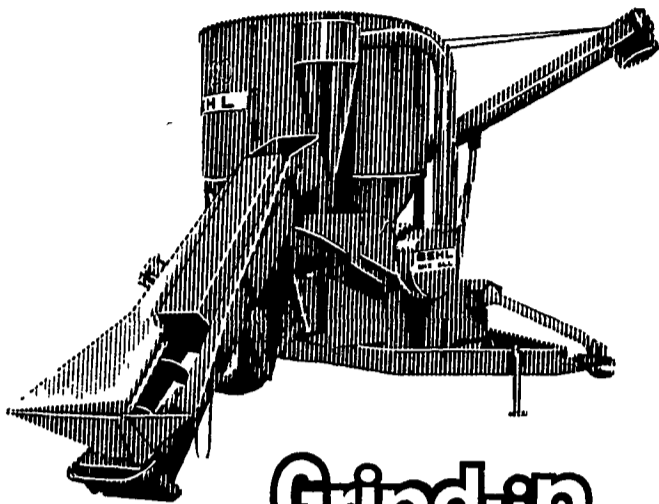
"The hope is that only the desirable components of the drainage will pass through the membrane. What stays behind will be a brine consisting of the acids and iron salts that make coal mine drainage a pollutant."

Prior to recent funding cut-backs an experiment was planned at the Hollywood facility that would have integrated the reverse osmosis technique with chemical-biological ones developed there.

It was to have been capable of handling 25,000 gallons a day.

"It now appears," says Lovell, "that the scale of the project will have to be drastically reduced. Whether this will effect our ability to develop a backyard R-O unit suitable for acid drainage is uncertain."

Hollywood, meanwhile, isn't waiting. The village is making plans to pipe fresh water from a source more than four miles away - at a cost of hundreds of thousands of dollars.



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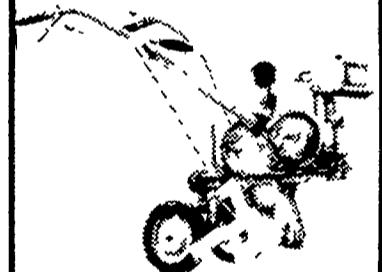
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