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Sections
Home Page
News
Sports
Features
Obituaries
Classifieds
Classified Form
Comments
Letters
Editorials
Police Beat
Business Directory
Archive Search
Kids Korner
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## Headline News

# Remediation work continues to be a challenge

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Three brief presentations on aspects of environmental remediation at Los Alamos National Laboratory served as a reminder of both the big job ahead and the provisional basis of this relatively new field of technological intervention.

Cleaning up somebody else's ugly old mess to standards established by other parties on politically determined budgets might sound like a recipe for frustration.

For some people it is a challenge.

Gabriela Lopez Escobedo, Becky Coel-Roback, and Rich Mirenda each gave a piece of a much bigger picture, suggesting in turn that a kind of success is possible, that technological innovation will play a role, and that even the complexity of an ecosystem can be examined systematically for signs of stress and health.

Escobedo discussed the creative ways her project found to beat the system, save money, and finish the job of cleaning up three large, dry lagoons laden with residues of several radioactive isotopes and various hazardous chemicals.

The lagoons at Technical Area 53 were used to drain wastewater from the Los Alamos Neutron Scattering Center (LANSCE). When the open-air pools were found to be objectionable, the facility was given a new wastewater treatment facility that brought the problem under control. But that left more than 5,000 cubic yards of contaminated sludge and liner exposed and needing to be removed. As part of a larger ongoing restoration of the site, this was only an interim action designed to prevent airborne emissions and protect human health and the environment.

Escobedo's report summarized the full operation but focused on cost containment. These included negotiations with New Mexico Environment Department for getting the project on a faster track, and then challenging formal requirements that made no sense.

Dumpster bins full of excavated material that were supposed to be cleaned up after each deposit at the Waste Disposal Site, for example, could be re-used without cleaning if they were simply treated as contaminated containers in both directions. Carefully mapping low-level waste to mix with relatively

10660

high-level waste meant fewer expensive road closings. More efficient planning meant fewer delays for workers putting on and taking off their personal protective equipment. A little bargaining with the waste operations facility meant, she said, "a better price in bulk."

The savings came in handy when unanticipated leakage under the liner of the northeastern lagoon forced the project to remove an extra 800 square yards of contaminant.

"Oh no!"she thought at the time, "the volumes are going up. But that's what happens when you're out in the field."

The project was finished within the fiscal year. Even so it cost about $1.7 million.

Coel-Roback has been involved in another time-consuming project demonstrating a promising new technology called non-traditional in situ vitrification (NTSV).

Vitrification is a way of converting materials into glass by melting everything together. In situ vitrification melts, in this case, contaminated soil into an inert, glassy block that will lock the toxic and radioactive elements into place when the glass cools. Non-traditional vitrification means the soil is heated vertically into apple-shaped blobs, rather than horizontally in sheets.

After a "cold" experiment on a non-radioactive test bed, the "hot" experiment began in April 2000. The object was to vitrify a piece of a contaminated absorption bed at TA-21, a relatively clean part of a very large disposal area at the east end of DP Road, where an estimated 40 million gallons of inorganic compounds and radionuclides were dumped until 1961.

The operation was conducted by sinking four electrodes into the earth and charging them with 276,000 kilowatts of power, heating the underground target area to a temperature of about 2,000 degrees Celsius.

Only last June, two years later, had the vitrified blocks cooled to a temperature where it could be drilled, core-sampled and analyzed.

An August 2002 Inspector General's audit of a vitrification project at the Hanford Site in the state of Washington, says current estimates for environmental remediation put the over-all cost within the Department of Energy at $230 billion over decades.

Although many technical hurdles remain, the lure of vitrification, as Coel-Roback, explained is that it can be used to treat large volumes, and many kinds of materials and contaminants, reducing the volumes and potential air emissions, and potentially save a lot of money.

Finally Mirenda reminded everybody about the purpose of all these efforts. He walked them through a series of increasingly complex and interdependent steps for developing an ecological risk assessment that must be used to characterize the adverse effects in a particular site, in order to help decide what, if anything, to do about it.

A project of the laboratory's Risk Reduction and Environmental Stewardship Division (PRES), ER's final public meeting of the year took place Wednesday night at the Betty Ehart Senior Center.