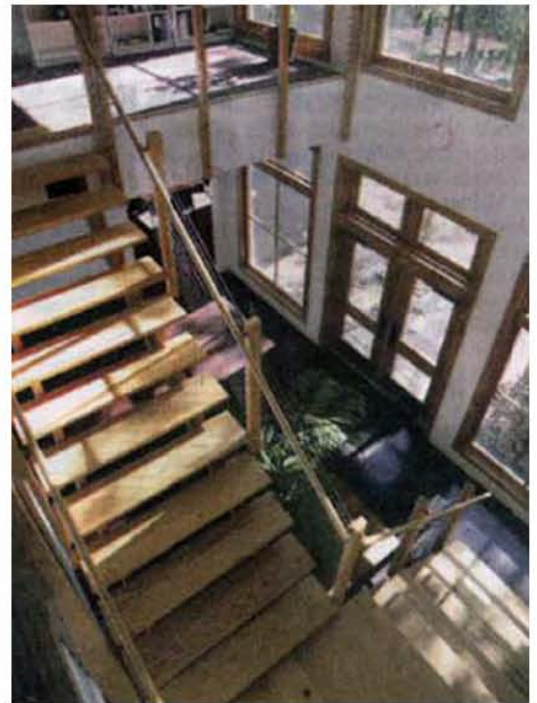
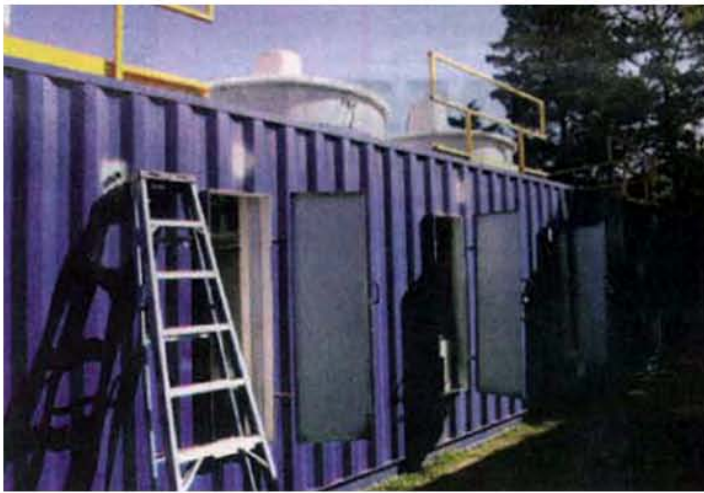


WATER PROOF



Biodigester Could Revolutionize Water Treatment Technologies

By **DANNY MOGLE**
Assistant Managing Editor

PALESTINE — Big Blue gets a new home today. After spending about five months at PCDworks near Palestine, the Deployable Autonomous Aerobic Biodigester — affectionately nicknamed Big Blue for the color of its protective exterior — is being shipped to Alpine for months of testing.

It will largely determine how successful the brain power at PCDworks has been in perfecting what is being hailed as breakthrough technology that transforms nasty wastewater into clean water that can be safely returned to the earth.

Specifically Big Blue, for the first time, provides a low-cost, easily transportable method to rapidly clean wastewater.

The project was initiated years ago by the U.S. Army, which contracted with the Texas Research Institute for Environmental Studies, based at

— Staff Photos By Jaime R. Canero
BIO FRIENDLY: Top, Mike Rainone, IDSA, Vice President of PCDworks campus near Frankston. Behind him is the pond used to test the device that will be deployed to Alpine tomorrow. Top left, Big Blue the "device" which will be deployed to Alpine in West Texas is seen. Above, a view of the main campus building at PCDworks near Frankston is seen. The complex of buildings was designed by Donna Rainone, AIA, President of PCDworks.

Sam Houston State University in Huntsville, to design a wastewater treatment system that could be hauled into remote areas and easily operated.

The Army needed a way to process the huge volume of wastewater produced by army units that set up in remote areas and the pulled up stakes and relocated.

After developing initial plans, TRIES turned to Mike and Donna Rainone's PCDworks, a technology development company. Housed on a 25-acre campus tucked deep in wooded rural Anderson County, PCDworks utilizes a team of engineers, designers, architects and specialists who brainstorm and develop solutions to perplexing technology problems.

TRIES needed PCDworks to get the bugs out of the design and create a monitoring system and computerized operations that would make Big Blue easy to move around, set up and operate.

"Our job was to make it work smarter," Rainone said.

On Tuesday, a methodical staccato clank, sounding like the steady beat of a very loud hand clap, rang through PCDworks as a double-diaphragm pump deep inside Big Blue forced water through a maze of storage tanks, pipes, valves and monitoring equipment.

A big hose extending from the unit sucked murky brown water from a nearby pond into the receiving tank. From another hose flowed out crystal clear water that had been processed by Big Blue and her armies of organic eating bacteria.

"I wouldn't drink it (the processed water), but I certainly wouldn't hesitate to put it back into a lake or stream," Rainone said.

IMPLICATIONS

"The potential implications for this technology are huge," said Sabin Holland, director of Innovation and Collaborative Programs at TRIES. "We can increase the health and safety of our troops overseas by eliminating the need for unreliable wastewater treatment contractors. We can also clean up Katrina-type disaster sites more rapidly, and deliver safer water supplies to Third World countries."

"Wastewater cleanup is a significant issue around the world and this is an important development. Imagine the possibilities for a wastewater treatment system that is portable enough to be brought to just about any site, can be fully functional in a matter of hours and can operate independently for up to six months at a time," said Rainone.

HOW IT WORKS

According to information from PCDworks, Big Blue uses four main tanks, three pumps and valves and sensors housed in a protective 40-foot long and eight-foot wide shipping container.

The wastewater — sewage — is pulled into a 1,000-gallon preliminary sedimentation tank by a powerful electrical grinding pump that devours solids and removes what becomes sludge from the water.

The water is then pumped into the first of two 1,500-gallon biological reaction tanks housing a large colony of bacteria ready to feast on the organic materials. The bacteria live in filters positioned throughout the tank.

The water is pushed through the filters by compressed air and mechanical circulation systems.

The water is then pumped into the second biological reac-

tion tank where more bacteria make dinner out of any organic material not taken care of in the first tank.

The secret, said Rainone, is maintaining the proper mixture of air, water and special bacteria.

From there, the water flows into a 1,000-gallon tank that removes remaining sedimentation. The clean water is then ready to be pumped out.

The system is powered by a double-diaphragm pump capable of pumping up to 40 gallons per minute. Sophisticated monitors keep tabs on water levels, water temperature, oxygen levels, the bacteria and the cleanliness of the water.

The electrical systems are connected to a main control panel which can be monitored by a computer away from the site.

Within 24 to 48 hours, Big Blue can convert wastewater into water that meets Environmental Protection Agency standards, promises Rainone. It can treat wastewater produced by about 600 people each day.

WHAT'S NEXT

PCDworks involvement with Big Blue will largely be over once she is loaded and shipped out, Rainone said. Testing will determine how well the system holds up over extended use.

Holland said the goal of TRIES is to get multiple units developed for the Army for potential use overseas by as early as 2010.

Rainone said he believes the technology will soon be developed to adapt Big Blue into a system that can bring sustainable and affordable drinking water to any place in the world and that it holds the hope of bringing a better life to literally millions of people.