Super recycled water: quenching computers

January 30, 2014

Conserving, recycling and "super purifying" wastewater, plus recycling waste to replace concrete

We know water is a precious resource, and fortunately we've created novel ways to use wastewater. In fact, at the Lab we reuse water up to seven times.

Currently, we're recycling about 300,000 gallons of industrial wastewater daily at the Sanitary Effluent Reclamation Facility (SERF), treating it onsite it rather than discharging it into the environment. We also reengineered systems to use less water, cutting millions of gallons from our overall water use.

We're "super purifying" this water, which is then reused in the cooling towers that support our high performance computing complex. Finally, this treated, recycled water is released into nearby wetlands that support biodiversity and further filter the water.

We also determined how to make our computing cooling towers use less water overall, for example using a polymer to prevent silica that is prevalent in our water from harming the equipment so we don't have to discharge this water.

We intend for SERF to meet all of the future supercomputing center's water needs—that's tens of millions of gallons of freshwater that we're leaving untouched in rivers and watersheds.

Speaking of those powerful computers, we've created award-winning architectures (such as in our ground-breaking supercomputer Roadrunner) that are extremely efficient. Capable of doing more, they're using far less energy and water.

Our scientists and engineers are also creating innovative ways to recycle SERF sludge (the mud-like silica cake from the treatment process), including creating recycled material to replace concrete, the most widely used construction material on Earth which also contributes nearly six percent of global carbon dioxide emissions.

Los Alamos National Laboratory **www.lanl.gov** **(505) 667-7000** **Los Alamos, NM**

Operated by Los Alamos National Security, LLC for the Department of Energy's NNSA