



## Community Partners

### Program

Engineers Without Borders-USA

### Project Location

Nicaragua

*CH2M HILL has partnered with Engineers Without Borders-USA (EWB-USA) since 2003. The organizations share a commitment to supporting service learning opportunities for engineering students and professionals through the implementation of sustainable engineering and construction projects in developing communities around the globe.*

## Mentoring Rice University Students on Engineers Without Borders-USA Project

Emily Holtzclaw and Greta Zornes are engineers who focus on water resources at CH2M HILL. What distinguishes them from most other engineers in their field is that in 2006 they teamed up to mentor a group of six Rice University students in an Engineers Without Borders (EWB-USA) project in Bernardino Diaz Ochoa, Nicaragua.



The project began in March 2005 when the group of students and a mentor traveled to survey the Bernardino area for potential projects. The team discovered that the village lacked electricity, a reliable source of clean water, and health infrastructure. They began planning the future phases of their project and returned a few months later to install a small solar lighting system for the church, the focal point of the community.

The next year when Holtzclaw and Zornes attended a local EWB-USA Houston Professionals Meeting, they learned that this team of students was in need of a new mentor. They had experience and a continuing interest in international service work, but both having small children at home made such a commitment difficult. Determined to find a way to help out, Holtzclaw and Zornes decided to split the duties of a mentor and help the Rice students complete their project in Nicaragua.

The two women then began guiding the students through the design of the water systems they would build. They alternated attending the weekly team meetings and so managed to balance a career, a demanding volunteer position and a family.

In August 2006 the team took a two-week trip to provide clean drinking water to all residents of the community and to plan for a health center to be constructed on a later trip. Holtzclaw and Zornes split the two weeks, during which the group stayed at a hostel for \$5 per night, where they slept on cots. The team spent their last night in the community, sleeping on church pews.

The team left Bernardino with a success story. They managed to construct a rainwater catchment system on the church roof that would feed to a tank nearby to provide a source of clean rainwater during the wet season. They hired a contractor to construct a hand crank rope pump to obtain water from an existing well to fill a second tank by the church. The team installed bio-sand filters to ensure microbial contamination was minimal, given the water was from an open well. In addition, each of the 24 homes in the community was provided with Potters for Peace ceramic filters to purify the contaminated water from each home's well. The team purchased the bio-sand filters and the Potters for Peace from local non-profit organizations. Throughout the trip, the team worked with the community to illustrate the use and maintenance of the systems. Basic hygiene habits, such as handwashing before meals, were discussed during visits to the school and while conducting household surveys. They hope that the effectiveness of the new water systems will encourage neighboring communities to adopt similar technologies.



The Rice student team has since planned and is constructing the health center that will host a traveling doctor and serve between 800 and 1,500 people around the area. When they returned to Bernardino, the water collection and filtration systems were all working and benefiting the community. The team is currently finishing the health center and once it is completed, they plan to continue working in the village or adjacent areas.

Holtzclaw and Zornes experience with EWB-USA was something they will never forget. It taught them new project management skills and provided networking abilities with people who share similar passions. They also began to comprehend engineering on a very meaningful level. As Holtzclaw summarized it, "We had to break [the project] down into simple components with a short time frame and limited budget. You never fully understand what you do until you teach it to someone else."