

Ball State University's Geothermal Project Benefits the Community, Country, and the Industry

By Bonnie Love, Editor

WorldWide Drilling Resource®



Darrel Prine from Dedicated Geothermal is one of the many locals working at BSU. All photos courtesy of Rick Nash, Dedicated Geothermal.

In the June 2009 issue of *WDR*, we brought our readers the story of Ball State University (BSU) joining the geothermal wave of the future. This project has become momentous for more than one reason.

Just about everyone in the geothermal industry has heard about the massive geothermal project underway at BSU. When the BSU board of trustees decided to replace the campus' four coal-fired boilers built in the 1940s and 1950s, they ultimately decided to enhance BSU's reputation as a role model for green campuses by choosing geothermal energy. With more than 4000 bores drilled to 400 feet*, it is the largest geothermal exchange project in the country.

Messer Construction Company was chosen as the general contractor for the project. An employee-owned company, Messer ranks nationally as one of the top 100 largest contractors and a top 100 green contractor. They are a regional construction manager and general contractor providing leadership for complex commercial building projects in Ohio, Tennessee, Indiana, and Kentucky.

There have been many accomplishments with the BSU project. According to Messer's Senior Project Executive for the project, Pat Kinder, "I think one major accomplishment has been that we have challenged our project team to improve the drilling process. We have encountered numerous unforeseen conditions while drilling and boring. We have not let that

hamper the project and our progress. We have asked our team to 'think outside the box' and try to improve the process and better production...we are always looking for improvement." Drilling the boreholes became challenging. Due to space restrictions, drilling contractors stepped up to the plate by doubling the depth of the boreholes to 400 feet* and double looping the field to get enough heat for the more than 40 buildings on campus. Once drilling professionals drilled through the 40-50 feet* of overburden, they were faced with more than 350 feet* of limestone.

The magnitude of this project attracted several bit manufacturers, who traveled from around the world to Muncie, Indiana, for the chance to test their bits in the tough limestone. Dick Palmer with Palmer Bit Company has 40 years of drill bit experience, so he was invited to the historic project. He brought some prototype bits the company had been working on.

"This project had a lot of unique challenges. Even on a big well field like this, there were smaller areas with a lot of different soil conditions," Rick Nash from Dedicated Geothermal said.

Bit after bit did not meet production expectations, including Palmer Bit Company's test bits, but that didn't stop him from working on the problem. Dick called his partner, Kevin Christensen who was back at Palmer's North Dakota facility, to help with the problem. Using Rick's input, Palmer Bit was able to make a diamond PDC bit that chewed right through the limestone!



According to Dick, "The penetration rates with the traditional PDC bits were 11 minutes for a 20-foot stem. With our Diamond Devil™ bit, the penetration rate was four minutes per 20 foot* stem...cutting the penetration rate by two-thirds." Through the combined efforts and expertise of Dick, Kevin, and Rick, the new, revolutionary Diamond Devil™ bit was created. Now this groundbreaking bit is being sold all over the world including Australia, Canada, England, Germany, and across the United States. "Really, it's being used wherever there are tough drilling conditions," Dick said.

This helped production numbers. "The new bit has worked great for us. It helped reduce

costs and maximize production for this job," Rick said. That's music to ears of drilling professionals *WorldWide!* Unlike traditional PDC bits, this bit won't plug, plus it's easier and less expensive to repair. Best of all, the patent-pending Diamond Devil™ bit is the least expensive PDC bit on the market.

Everyone seems to be happy about working on this project. Dick said, "We were very pleased to be involved with the Ball State project that in turn, helped us create a bit to help the entire industry. Rick and Kevin were an immense help to me." Rick had a similar statement. "Messer, the people with Ball State, and the guys at Palmer Bit have been absolutely great to work with," he said. Tim Steigerwald, senior vice president for Messer's Indiana region, said they "...found that Ball State personnel value the time Messer invests to listen to all stakeholders' input to ensure we create and lead what will likely become the industry standard for this type of construction project. We thank Ball State for entrusting such an important project to Messer and we surely won't disappoint them or the industry."



Dedicated Geothermal is using the Diamond Devil™ PDC bit to bore holes for the largest geothermal exchange project in the country.

The BSU project is benefitting the geothermal industry and giving companies valuable experience. According to Kinder, "There are not many industry standards for geothermal work and geothermal experts are few and far between. The Messer team includes some of the most experienced geothermal contractors around, along with an experienced geothermal engineer. That being said, we are all equals when it comes to solving problems, working through tough situations, and finding better ways to do tasks. Our team effort is truly a give and take, an example of continuous improvement, a feeling of we can always do better.

I expect until the final hole is drilled that we will be looking to improve our processes."

*(1 foot = .30 meters)

(1 ton = .907 tonnes)


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