

Trenchless TECHNOLOGY™

REPRINTED FROM JULY 2012

Record Crossing Symbolizes Advancements for Industry Standards



Horizontal Directional Drilling Guide

Laney Directional Drilling (Laney) completed a record 10,971-ft horizontally directional drilled (HDD) pipeline crossing for Kinder Morgan Pipeline in March, making the possibility of longer HDD crossings within reach for the industry.

"This was the first crossing of more than two miles. We've shown we can use the pilot hole intersect method to drill longer crossings," says Grady Bell, vice president of business development at Laney. "Instead of considering 7,000 to 8,000-ft drills, we can now realistically look at crossings of 14,000 to 15,000 ft long."

It was time for Kinder Morgan to replace its existing pipeline that parallels the FM 1960 bridge crossing Lake Houston in northeast Harris County, Texas. The HDD crossing originally started as a design-build project and included a six-inch-diameter steel gas pipeline with a 0.432 wall thickness, fusion-bonded epoxy coating and an abrasion-resistant overlay.

Sunland Construction served as the pipe contractor, and Laney was the HDD sub-contractor called in to complete the project after the first HDD sub-contractor failed. Laney completed the record length drill in just over two weeks.

One key to the successful HDD design was avoiding the previously attempted pilot holes and lost tools left down hole by the first HDD sub-contractor. Bell explains, "Everyone assumed we would go deeper than the first crossing attempt that was at about 160 to 180 ft, but we decided there was a better formation of good, dense sand at about 120 ft depth."

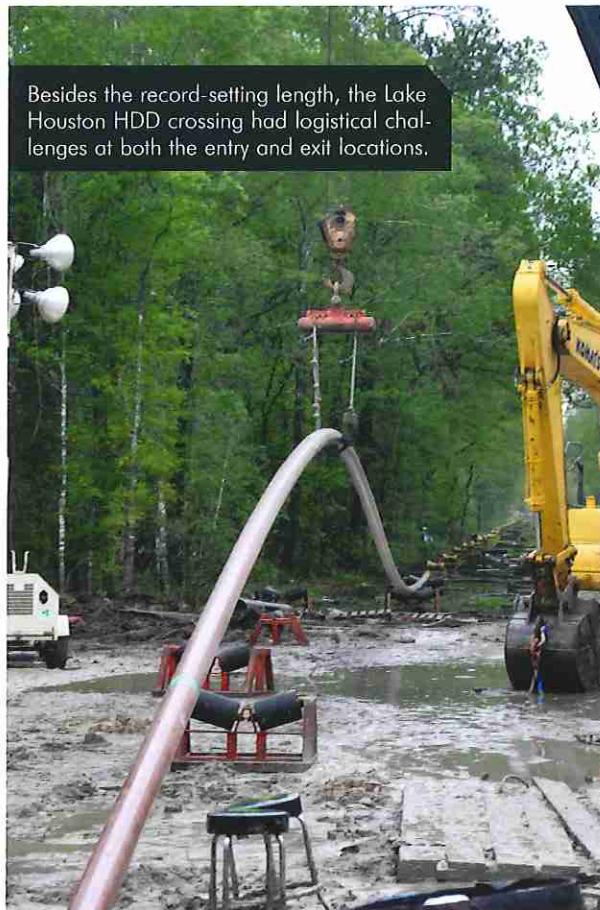
Laney picked the dense sand to reduce the potential for inadvertent returns and hydraulic fracture. It also wanted to be above the lost downhole tooling to reduce the interference and pilot hole surveying issues its drillers might have encountered from these undesirable obstacles.

The HDD design also included a side bend of 17.5 degrees, which normally is not a challenge on shorter crossings. John Odom, one of Laney's field superintendents on the record-breaking project, says, "It takes a lot of torque to turn that much drill pipe. We just had to take the side bend gradually and make sure we had really good drilling fluid in the hole at all times."

Kevin Barton, the other experienced Laney field superintendent on the project,

agrees that managing the drilling fluid was another key to success. "We had a mud engineer onsite during construction to keep the fluid right. With this length, we needed to carefully consider things like the viscosity of the mud and PH of the water."

Both Odom and Barton have been working as HDD drillers for nearly 20 years each, and this was the longest crossing either had participated in.



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Besides the record-setting length, the Lake Houston HDD crossing had logistical challenges at both the entry and exit locations. On the entry side, Laney had to set up its rig between two existing, in-service pipelines. Odom explains that a normal dead man setup is 16 ft wide; however, Laney only had 15 ft to work with between the two "hot" pipelines.

The dead man and LDD-750 rig on the exit side also had to be modified to fit in the space available, and Laney even had to move a section of old pipeline at the site to fit the drilling equipment. Other obstacles acting as work site constraints included railroad tracks, a gas station and apartment complexes to name a few. Odom says the alterations to the drilling equipment were made on the spot as they didn't know the full extent of the space

restrictions until they arrived onsite.

After Laney adjusted to site conditions, a crew from each side drilled toward the middle of Lake Houston. A mile and a half of the crossing was under water. Barton and Odom worked from the exit side because that is where the 17.5-degree bend was designed. After the drill pipes intercepted, Barton explains that he and Odom took their drilling experience to the entry side to help push the drill pipe out all the way to the exit side of the crossing.

Having the second half of the crossing already drilled via the pilot hole intersect method made it possible to push the drill pipe successfully for such a long length. No reaming was required, so after the drill pipe was through to the exit side, Laney proceeded to pull the product pipe through the nearly 11,000-ft hole.

"As far as the pullback, everything went well," says Odom. "We worked 24 hour days, in two shifts per day to keep the pipe moving, stopping only to make each of the tie-in welds." Because of the space restrictions on the exit side of the crossing the pipe contractor, Sunland, had to make three tie-in welds in the rain as pipe pullback was completed.

Laney's team effort helped make this a successful project for the contractor and for Kinder Morgan. With this crossing in the record books, Laney is ready for its next challenge, and considering the plausibility of even longer HDD lengths is now not out of its or the industry's grasp.

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