

# Borno Rural Water Supply project advances in Nigeria

One of the driest states in Nigeria, Borno gains new water supply by drilling boreholes. Dando Drilling International's Managing Director Martin Fitch-Roy reports.

Only 47 percent of the Nigerian population has access to clean drinking water, according to the World Bank, and groundwater is considered to be the predominant source of new water supply. For this reason, the Nigerian government is investing significant resources in tackling water scarcity by drilling new water wells, according to State Commissioner for Water Resources Ahmed Mai Sheriff.

The Borno Rural Water Supply (BRWS) scheme is a long-term initiative that will ultimately provide 480 water wells in rural areas within the state. In 2012, the state government awarded a contract to Dando Drilling International, a rig manufacturer based in England, to supply ten drilling rigs and associated equipment in addition to commissioning and training services as part of the BRWS. Borno is one of the driest states in Nigeria. Dando has a long history in Africa that dates back to 1868 when the company first supplied tubewells for Abyssinia (Ethiopia) and shipped the first drilling rig to Nigeria in 1950.

Water scarcity is one of the most challenging global issues in the 21st century and the lack of clean water and adequate sanitation has devastating effects. The range of water and sanitation related diseases include cholera, guinea worm disease, bilharzia and intestinal worms, but one of the most pernicious is diarrhoea, claiming the lives of 1.8 million people per year -- 90 percent of which are children under five. Through its Millennium Campaign, the United Nations is working to reduce the proportion of people without access to safe drinking water by 2015 by 50 percent and is being aided to reach this goal by many international organizations and government departments.

In December 2012 Dando shipped four Watertec 40s top drive rotary drilling rigs to Maiduguri in Borno and six more in April 2013. Capable of a wide range of drilling techniques, the deep water well drilling rig is designed for drilling large-diameter water wells in challenging climates and terrains. Aid agencies, government departments, and private contractors favor the rig for its lifting capacity of 40,000 kgf for deep borehole drilling projects. The drilling capacities are: 88.89 mm (13.5 kgs/m) drill rod = 2,962 meters (m) and 114.3 mm (23 kgs/m) drill rod = 1,739 m.

The rig features a standard Caterpillar C15 540-horsepower (hp) diesel engine and a high torque rotary head. Other options are available. The break out system is a double-acting hydraulic cylinder with adjustable wrench. Mast working stroke 9,140 mm (main winch) and 7,600 mm (rotary head). The 190.5-mm x

**Water scarcity is one of the most challenging global issues in the 21st century and the lack of clean water and adequate sanitation has devastating effects.**

203.2-mm duplex mud pump is hydraulically driven. The Watertec 40 is mounted on a standard 6-ft x 6-ft truck with full protection afforded to the mast, engine, and mud pump.

In Maiduguri, the first borehole was drilled in terrain predominantly consisting of sand and clay using the rotary mud flush method. This method is known to be one of the fastest techniques for reaching required depths and is considered ideal for deep wells in soft to medium-hard formations and to control the stability of the borehole wall.

During commissioning, the Maiduguri borehole (600-m-deep) was drilled using a 323.84-mm tricone bit, and was cased using 200-mm-diameter steel casing screens. The mud pump relies on drilling fluid consisting of bentonine and water with some additives to enhance the viscosity. Upon completion, the Maiduguri community gained access to a new water supply delivered via the new borehole.

All four rigs are drilling new boreholes at various locations in Borno state. The six remaining rigs are waiting for commissioning and training before they are deployed. For the Borno project, a Dando engineer traveled to Nigeria to test the rigs confirming that they operated as required. He also provided training on the best drilling techniques for the particular terrain in the project area.

In 2010, the state government of Edo, Nigeria, received two Watertec 24 Dando drilling rigs to drill wells in Edo Central and Edo North Senatorial Districts. The first borehole drilled at Ekpoma in Edo Central was drilled using a 323.84-mm tricone drilling bit down to a depth of 340 meters, and was cased using 200-mm-diameter API steel casing and 200-mm-diameter Johnson stainless steel screens. The borehole is currently working with a 50-horsepower submersible pump, supplying safe drinking water to the town. The first Edo North borehole was drilled at Elele village at Auchu Town using a 323.89-mm tricone bit, which drilled through shale and then sandstone to reach a depth of 240 m. The borehole was



The Watertec 40 rig is drilling boreholes to increase water supply at various locations in the Nigerian state of Borno. Photo by Dando Drilling International

cased with 200-mm steel casing and is working with a 30-hp submersible pump. Buoyed by the success of the two rigs, the state government ordered a new Dando Watertec 40 drilling rig and the three Watertecs have drilled 120 deep boreholes, of which ten have artesian flow.

The Nigerian state of Yobe also used two Watertec 24 rigs to drill more than 200 boreholes. With a pullback capacity of 24 tonnes, the high performance Watertec 24 drills to depths of 1400 m while mounted on a truck or, alternatively, on tracks, trailer, or the customer's own support vehicle or structure.

In early 2013 Dando and Hydrofor, an African drilling contractor, launched a water well drilling services division to provide borehole drilling services in Western Africa.

#### Author's Note

Managing Director Martin Fitch-Roy of Dando Drilling International is based in Littlehampton, England, United Kingdom. For further information, visit the website: [www.dando.co.uk](http://www.dando.co.uk).