INSPECTING A CLASSIC BOREHOLE

St. John's University of Tanzania (SJUT), in Dodoma, requested that Ground+Water Tanzania Limited inspect and test three boreholes owned by the University, an old farm or Shamba borehole, another used for water supply, known as the Kwa Makubeli borehole, and a historic borehole adjacent to the university property known as the "railway" or the "Germans" borehole. We'll focus on the last one. Naturally enough, like any good university, SJUT hopes to irrigate their nearby football pitch with the produced water. The property manager planned ahead and had a pipe laid under the road when it was last paved.

According to information we gathered, this borehole was drilled early in the 20th Century (prior to 1915) to provide water for steam locomotives passing through the Dodoma Railway Station. It had been used intermittently since and was thought to be exceptionally productive. The borehole site includes a security cage attached permanently to a concrete pad, a concrete base for a piston working head around the casing, and the engine base (engine long removed, more recently equipped with submersible pumps).

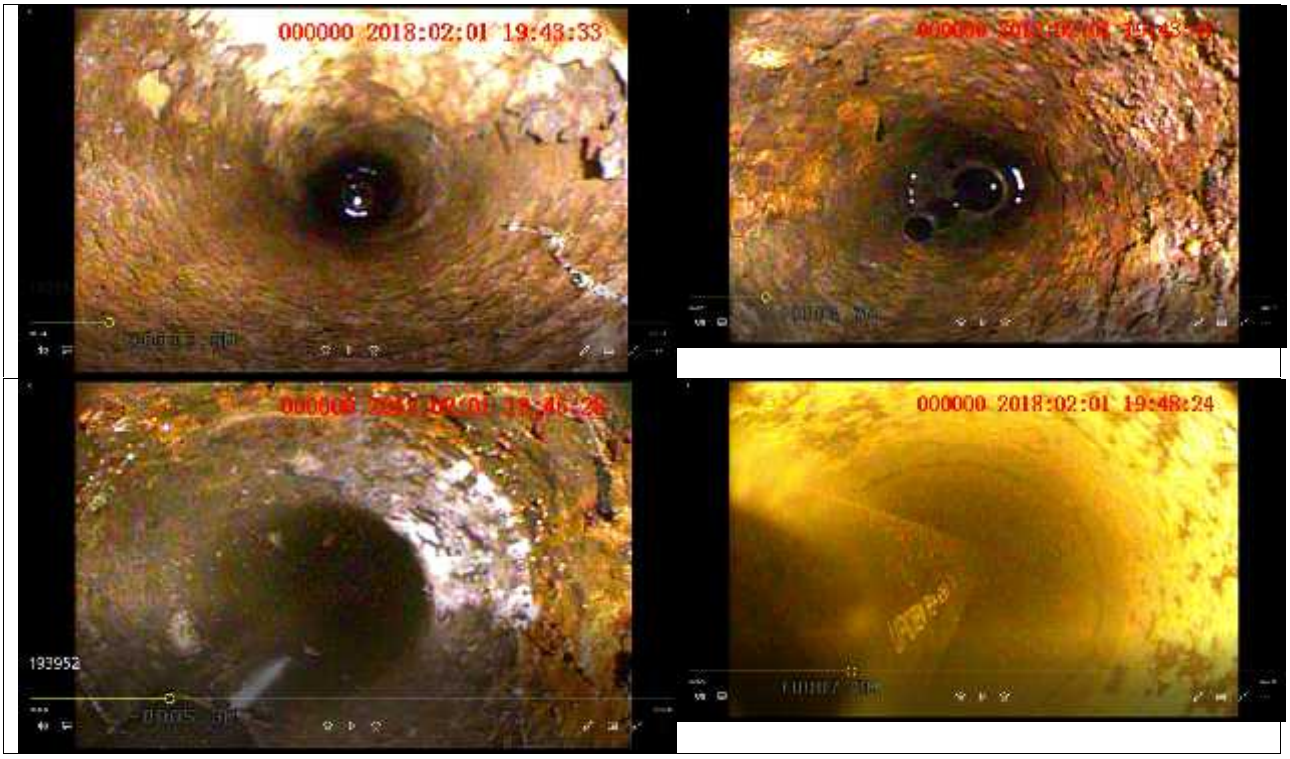
Borehole Inspection Technology

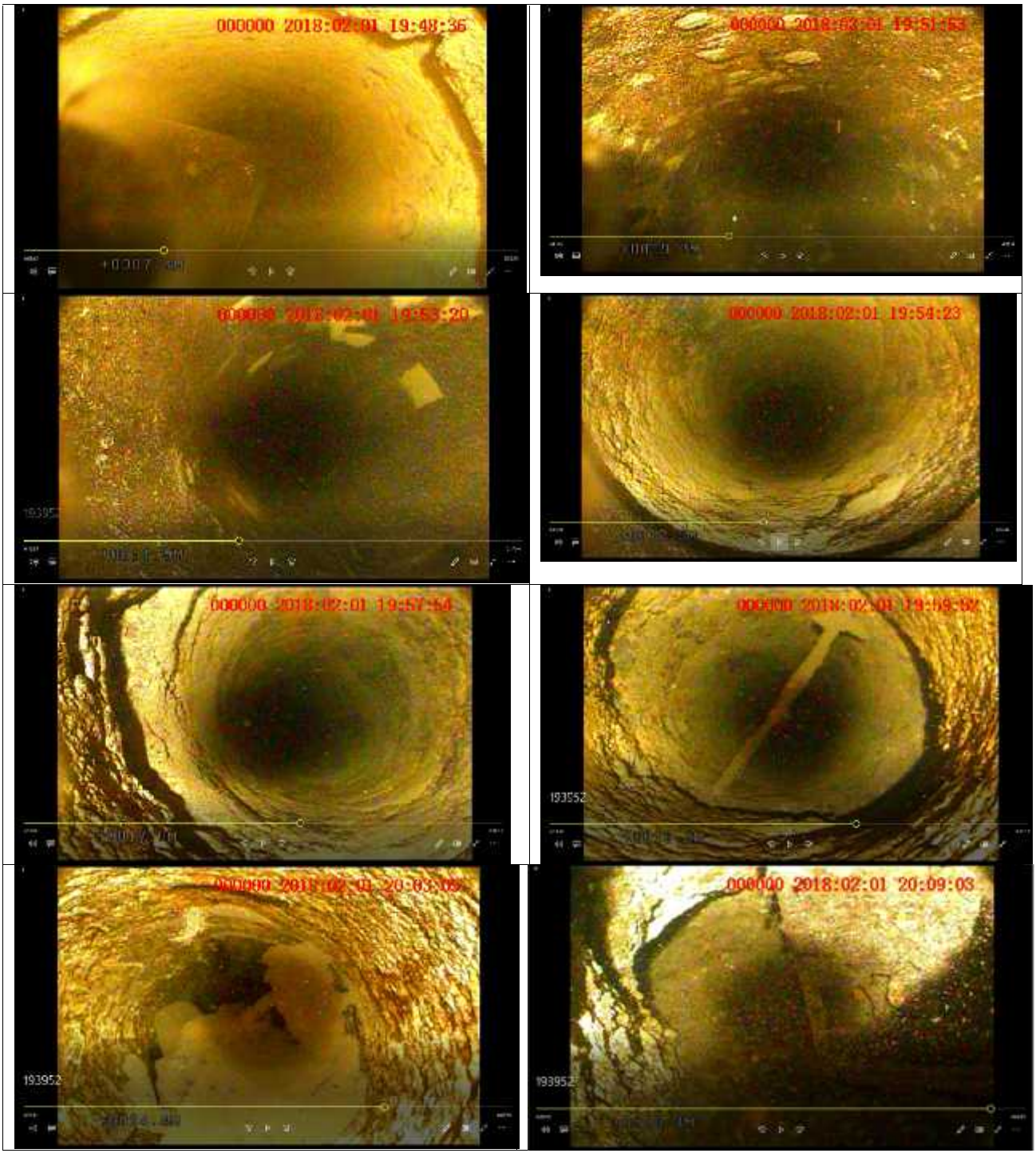
For borehole inspection we used a U.S.-made Allegheny Instruments Nano borehole camera. While it has a simple look-down view, this system is appropriate for the market as it is now (we'll see about a more elaborate one in due course). The small Nano records to an SD card (eliminating the need for CD decks) and produces very high quality video, from which clear still images can be extracted. The camera is suspected in the well and operated on a manual reel, with an imprinting depth counter.

Using the Nano borehole video system (Allegheny Instruments)

Screen shots of the Railway borehole video

The borehole itself, which has never been examined in its long lifespan, is cased to about 12.5 meters, and the casing seems to have a liner, which is partially corroded away. The borehole continues open-hole to a current depth of about 30.5 m. There is no available borehole record, so original total depth is unknown. The borehole is remarkably clean. However, a collection of dropped objects, including a good sized piece of pipe, is visible – not unexpected.





It was initially difficult to tell whether 7.4 m was the end of the casing, until the squares visible at 11.9 m made it clear that was casing. The feature at 24 m appears to be a biofouled plastic shopping bag. The borehole was drilled with cable tool in fractured granite, so anything approaching round indicates some skill. As Dodoma is not far from the Rift Valley (where East

Africa is in the process of leaving the rest of the continent), small quakes upwards of Magnitude 4 are not unusual, and they can cause borehole collapse over time.

Further Work

The next steps are to fish out objects and then attempt airlift rehabilitation to clear out the borehole. We'll see if it is deeper than what we can see now. Then pumping testing will document the available capacity, prior to installing a pump and connecting to a control system, tank and further distribution.

This wasn't an especially monumental job, but it was interesting to visit a borehole drilled over a century ago by unknown craftsmen for a very different cultural and economic time: Before the Anglicans came to supplement the Evangelische (Lutherans), Roman Catholics, and Muslims (still the majority here), and long before it occurred to the people in charge to have a university for students from the towns and villages of central Tanganyika.