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## ENHANCING SUBSURFACE CHARACTERIZATION THROUGH THE USE OF 3D UNDERGROUND IMAGING

Christopher R. Proulx<sup>1</sup>, and Gary N. Young, P.G.<sup>2</sup>

<sup>1</sup> TBE Group, Inc., Clearwater, FL

<sup>2</sup> Underground Imaging Technologies, Inc., El Paso, TX

**ABSTRACT:** Over the past several years, ground penetrating radar (GPR) systems have been developed and improved upon to enable the accurate mapping of underground utilities and other structures. Many companies now consider the use of GPR a standard process in their Subsurface Utility Engineering (SUE) investigations.

Now systems have been introduced that deploy multiple GPR antennas on one platform to allow creation of 3D images of the subsurface for even more complete mapping. In addition, these 3D Radar systems have been augmented by multi-sensor electromagnetic induction (EMI) systems to help image metallic targets. These 3D Underground Imaging systems help engineers do a better job of mapping whatever is in the subsurface by producing high data density images of the target zone. Having such data available benefits stakeholders by aiding in project design and decreasing project delays due to unknown underground structures that may otherwise be discovered only during construction.

This paper describes such a 3D Underground Imaging system and then provides relevant case histories.