***Efficient Data Collection Practices using the APEX OnePass Sensor with Stencil SLAM and RTK-GNSS Technologies for a Remedial Action***

Tanya VanderVis, TerranearPMC, tvandervis@TerranearPMC.com

Dominique Seles, TerranearPMC, dseles@TerranearPMC.com

Jon Miller, White River Technologies, miller@whiterivertech.com

Jeffrey Leberfinger, TerranearPMC, jleberfinger@TerranearPMC.com

Brian S. Brunette, GSI Services Group, bbrunette@gsisg.com

David Duggins, Kaarta, dduggins@kaarta.com

Eric Tow, TerranearPMC, etows@TerranearPMC.com

The TerranearPMC–White River Technologies, LLC Joint Venture (TPMC-WRT) was contracted by GSI North America, Inc. to conduct an advanced geophysical classification (AGC) survey in the spring of 2022 in support of the Military Munitions Response Program (MMRP) Remedial Action (RA) on a Munitions Response Site (MRS) at an active military installation. As part of the RA activities, TPMC-WRT performed a one-pass dynamic AGC survey of the MRS, which included both Global Navigation Satellite System (GNSS)-accessible and GNSS-denied areas. Our team used the Kaarta Stencil 2-16 Simultaneous Localization and Mapping (SLAM) for accurate positioning of the APEX sensor in areas of dense tree canopy that precluded the use of GNSS. Our presentation will discuss the planning and practical aspects of the data collection efforts using the APEX OnePass system integrated with both RTK-GNSS and Stencil SLAM. Specifically, we will discuss best survey practices for acquiring one-pass AGC data with SLAM positioning in wooded or densely vegetated areas. Our analysis will include a comparison of SLAM and GNSS positioning performance based on the blind and Instrument Verification Strip (IVS) seed offsets achieved using both technologies. We will also provide strategies for efficiently implementing survey control and instrument verification at sites that require use of both GNSS and SLAM positioning.