A case study for Geophysics in Difficult Environments: Third-party validation seeding and potential benefits of in-person site visits at Former Fort huachuca

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In 2022, Jacobs performed third-party validation seeding on behalf of the United States Army Corps of Engineers (USACE) in advance of a remedial design (RD) at the 548-acre Former Fort Huachuca Munitions Response Site (MRS) 03 – Artillery/Mortar Range, Target Area A, located in Cochise County, Arizona. MRS 03 is characterized by the difficult environmental conditions associated with the arid southwest United States including drastic temperature fluctuations, unpredictable precipitation events, challenging vegetation, threatened species, archeological resources, and sloped terrain. Information gleaned from available Government furnished information (GFI) and off-site research proved insufficient to identify the true challenges associated with this project site. Conditions such as those that exist at MRS 03 can only be fully realized through the detailed observations obtained through an in-person site visit. In an attempt to understand site conditions with the goal of maximizing efficiency to the extent possible prior to mobilization, Jacobs communicated with the RD contractor and learned of specific site challenges including the presence of vegetation capable of puncturing tires even after vegetation clearance. Upon site mobilization, Jacobs discovered that wheeled modes of transport were constantly challenged by either getting stuck in loose sand if the platform was heavy, or risk tire puncture by using a lighter wheel and tire configuration. Jacobs also observed that temperature-based instrument drift was greater than anticipated due to elevation-based differences in daily temperature ranges.

Although the task of validation seeding may not pose the same magnitude of challenge as performing a large-scale RD, an in-person site visit focused on collecting relevant site-specific data would help both RD and third-party validation contractors make more informed decisions when developing the technical approach. Data types and observations that can be collected to mitigate risks to the proposed technical approach include LiDAR based slope and terrain data, soil compaction data, and even mock sensor platforms to test performance in actual terrain settings.