Leading Change: How Geophysics Will Play a Key Role in the Future
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We can all agree, the application of near-surface geophysics is increasing. Just ask any of your colleagues if they are busier than ever. Our industry is serving a much wider range of clients and needs, as well as delivering more useful products! Often the clients are large and small ‘prime’ firms, who provide services to stakeholders of infrastructure, contaminated sites, or water resources. Risk reduction is at the core of this growth and is the future of geophysics. The application of geophysical investigations early within a engineering or environmental project life cycle will enhance the understanding of site conditions and decrease the incidence of unforeseen subsurface conditions. Through my personal experience of ‘introducing and explaining’ both what geophysics can do and provide example projects about the value that geophysics brings to these stakeholders, it is great to see the fruits of that labor. It is clear to me that a new generation of engineers, environmental scientists, and hydrogeologists recognize the validity of our applied science. With over 4 decades of experience to share, this presentation will deliver a message with the expectation that young and old geophysicists will come away excited to be part of this industry. Why is this change occurring? Is it due to an urgent need? Is there a powerful guiding coalition? Has a clear vision been communicated? Have obstacles to use been addressed? These questions mirror the change in management process defined by Dr. John Kotter. This foundation provides an appropriate framework for the following questions. How should we, as a professional group, facilitate the future application of geophysical investigations at an early stage of projects? And how do we gain advocacy from outside of our profession to sustain this change? Tangible evidence reveals that multiple large federal agencies have taken a new stance on the use and application of near-surface geophysics. For example, the Federal Highway Administration launched the Advanced Geotechnical Methods in Exploration ( A-GaME ) effort and its website (www.fhwa.dot.gov/engineering/geotech/agame/) with a spin off Geophysics Users Group, training materials, and a revamped 2005 transportation website (https://dfi-geophysics-tool.org/); the Environmental Protection Agency recently launched their website and training materials (https://www.epa.gov/environmental-geophysics); and, The U.S. Army Corps of Engineers is rewriting their engineer manual entitled “Geophysical Exploration for Engineering and Environmental Investigations”, previously published in 1995 (EM 1110-1-1802). Lastly, the Department of Energy continues to lead the way with a new strategy called “The Three Gs of Characterization Technologies: Geophysics, Geochemistry, and Geology”. These large federal agency examples demonstrate the shift in our near-surface geophysical industry. The primary reason our industry is growing is not steeped in fancier equipment or software. It resides in the fact that all these agencies must find better ways to reduce risk for their projects. These unforeseen risks are most impactful in two categories (not listed by priority): budget overruns and schedule delays. We can see evidence of a trend toward the application of geophysics to benefit an understanding of site conditions and reducing the incidence of unforeseen site conditions. Ultimately, the demand of stakeholders, owners, and decision makers will accelerate and sustain the change from project development and completion to sustainment. This presentation will illuminate the current state of this paradigm shift.